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Technical Sciences

APPLICATION OF SURFACTANT SOLUTIONS TO INCREASE THE OIL CONTENT OF THE FORMATION

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Abstract. The oil yield coefficient is the ratio of the volume of oil produced to the volume of oil calculated at the original field. Chemical methods for increasing the oil content of the formation are wetting with the use of active additives (surfactants, polymers, alkalis, sulfuric acid, micellar solutions).

This article shows the method of using surfactants to increase the oil permeability of the reservoir. One of the processes of increasing oil permeability is considered to be the wetting of the layer with surfactant solution. Surfactants (surfactants) are substances that adsorb at the boundary of phases, reducing the surface tension of this boundary. Surfactant solution can be used at the initial and final stages of field development. This method is used in order to break down the residual oil, break down the oil film and increase oil permeability. The surface activity that many organic compounds can exhibit under certain conditions depends on the chemical composition of its molecules and external conditions. Examples of them are the following: the nature of the environment and contact phases, the concentration and temperature of the surfactant.

Keywords: increasing oil permeability, wetting, chemical method, surfactant solution, concentration.

Currently, the use of surfactants in various technologies to increase oil yield is one of the most necessary processes in terms of maintaining the Collector properties of the productive layer and influencing the oil production process. This is determined by the different properties and mechanisms of surfactants [1]:

* Adding surfactants to water can reduce the interfacial tension of the water-oil interface. At low interfacial voltage, oil droplets easily pass through deformation and porous filtration, thereby increasing the speed of oil droplets in the reservoir. In addition, when the concentration of the surfactant is higher than the critical concentration of micelles, the low interfacial voltage of the solution contributes to the dissolution of the oil drop in the surfactant solution.

* Adding surfactants to water by reducing surface tension can reduce the contact angle of wetting, i.e. increase the moisture content of rock and water. The combination of hydrophilization and interfacial stress reduction leads to a significant decrease in the adhesion of oil to the surface of rocks. Aqueous solutions of surfactants have a flushing effect in relation to oil, covering the surface of rocks with a thin film, which contributes to the rupture of the oil film [2].

In the 1940s and 50s, the first results of the use of surfactants were obtained in US fields. In 1971, this process used in Tatarstan. The technology of applying a surfactant solution is used in Tatarstan, Udmurtia, Western Siberia, Bashkiria, in river deposits. Surfactants are used in order to reduce the speed of movement in the cavities of highly permeable rocks, balance the "solution - oil" edge and break down residual oils, break down the oil film and increase oil permeability.

Features of the use of surfactant solution:

1. the productive layer is heterogeneous, in layers consisting of terrigenous and carbonate collectors with a permeability of 0.075-0.096 mkm²;
2. oil viscosity 2.1 – 3.6 MPa C under the condition of the layer;
3. at a layer temperature of 24-68°C (at a layer temperature of 70°C, surfactant molecules break down and the application efficiency decreases);
4. it is necessary that the reservoir water does not contain high amounts of calcium and magnesium salts (in case of high amounts of calcium or magnesium salts in the reservoir water, the structure of surfactant solutions is disturbed, unstable, and the property of water thickening is lost).

Surfactants used to increase the oil permeability of the reservoir: OP-10 and foreign products reagents prevocel W-ON, prevocel W-OF, konox J-109, terjitol, neonol, Triton, terjitol, etc.-ionogen – free surfactants-have been tested for the possibility of pumping into the reservoir in the form of an aqueous solution in order to increase the oil permeability. In the area of only a small concentration, the reagents terjitol and prevocel W-OF have the highest surface activity. Widely supported surfactants in the production are "Sulfen-35", "Sulfanol-35", op-10 (domestic product), etc. [3].

The industrial use of various methods of increasing oil supply, such as hydrodynamic, physico-chemical thermal, microbiological, combined methods tested at different times in the fields of Kazakhstan, can significantly increase the oil recovery coefficient to 60-70%. For example, the Uzen field, where the freezing point of oil is +32-38°C, has been a center for testing various methods of increasing oil production for many years. Including technologies for pumping hot sea water; cyclic flooding, dismantling of objects; well grid sealing processes have been tested and implemented. In addition, high-pressure electrol systems, methods of flooding with surfactant op-10 solution, polymer compounds, etc. were successfully implemented.

The karazhanbas field carried out various thermal methods, so, on an industrial scale, internal combustion and steam injection into the reservoir. At the Kalamkas field, the method of condensed water injection and the water-gas effect was implemented. In almost all fields, various chemical compositions and agents, progressive selection, the use of the flow of deflection technologies, drilling and operation of horizontal wells, etc. the influence of the formation on the near-deposit area has been introduced and will continue to be applied [4-5].

Thanks to the work of researchers and manufacturers, since the mid-1980s, the project of pre-water discharge units has been substantiated, and since the 2000s, pre-water discharge units have been introduced for the first time at the Uzen and Kalamkas fields. Further, the Kumkol and North Bozashi fields were equipped with pre-water drainage facilities. This unit will significantly unload commercial oil preparation facilities, improving the quality of the technological process. However, the process of preparing water for the system required further improvement. Solving the problem of improving the development of fields using the technology of oil displacement by water, it is important to ensure such a quality of water preparation for the system, which allows

you to maximize the preservation of collector properties and minimize complications in surface and underground equipment. Currently, in the service market, many companies offer various formulas of working agents for the organization of polymer flooding, various surfactants. To determine the initial velocity of the surfactant and the distribution of its concentration in the layer, the equation of the material balance of the aqueous solution of the surfactant in the initial water saturated layer is used [6-7]:

$$\frac{\partial c}{\partial t} + \frac{q}{mbh(1+a)} \cdot \frac{\partial c}{\partial x} = 0 \quad (1)$$

The action of the reagent is based on the interaction of surfactants with oil and the formation of low viscosity dispersions. The polymer components included in the reagent form thin films at the interface of the oil product-water phase and prevent coalescence by stabilizing the emulsion in the form of oil in water (figure 1-3).



Figure 1. Highly viscous, weakly moving oil under the condition of the layer.

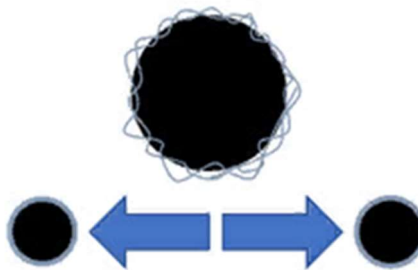


Figure 2. Creating a layer of surfactant that separates oil droplets.

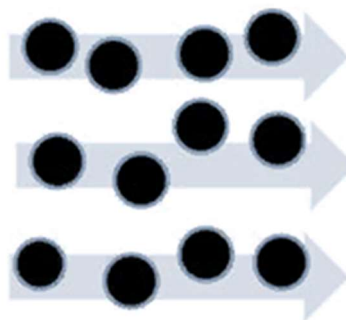


Figure 3. Primary, low viscosity, water-oil emulsion with high mobility.

This article shows the features of the method of using surfactants to increase the oil permeability of the reservoir. The technique, technology and organization of pumping surfactants are becoming more and more simple. In addition, laboratory tests of reagents pumped under

industrial conditions are carried out. According to the technology of long-term supply of a weakly concentrated surfactant solution, the surfactant solution is continuously pumped in an amount of 1-1.1 of the volume of the porous space of the oil-saturated part of the formation. According to the recommendations of the bashnipineft Institute, when using op-10 and similar surfactants, the first portion of the pumped medium should be 0.1% vertical, and then the reagent content is maintained at 0.05%. Surfactant solutions are prepared and stored at special bases. From the storage base, surfactant solution is delivered to the wells by special transport vehicles.

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İnformasiya cəmiyyətinin inkişaf mərhələləri

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Xülasə

İnformasiya cəmiyyəti — əhalinin böyük hissəsinin müasir informasiya texnologiyalarından istifadə etməklə informasiyanın, ən əsası isə onun ali forması olan biliyin istehsalı, saxlanması, emalı və ötürülməsi ilə məşğul olduğu cəmiyyət. İnformasiya cəmiyyəti IC postsənaye cəmiyyətinin bir konsepsiyasıdır. Bu, istehsalatın əsas məhsulunu informasiya və bilik təşkil edən sivilizasiyanın inkişafının yeni tarixi fazasıdır.

İnformasiya cəmiyyətinə xas olan münasibətlər informasiyalaşdırma prosesinin uğurlu başa çatdırılması nəticəsində formalaşır.

İC-nin fərqləndirici cəhəti:

- Cəmiyyətin həyatında informasiya və biliyin rolunun artması;
- daxili məhsulların axınında informasiya kommunikasiyalarının, məhsullarının və xidmətlərinin payının artması;
- insanların effektiv informasiya qarşılıqlı əlaqələrini, dünya informasiya resurslarına müraciətlərini təmin edən və onların informasiya məhsullarına və xidmətlərinə olan tələbatlarını təmin edən global informasiya fəzasının yaradılması.

Summary

Information society — a society in which the majority of the population is engaged in the production, storage, processing and transmission of information, and most importantly, its highest form, knowledge, using modern information technologies. Information society IC is a concept of post-industrial society. This is a new historical phase in the development of civilization, the main product of production of which is information and knowledge.

The relations inherent in the information society are formed as a result of the successful completion of the informatization process.

The distinctive features of the IC are:

The increase in the role of information and knowledge in the life of society;

The increase in the share of information communications, products and services in the flow of domestic products;

The creation of a global information space that ensures effective information interaction of people, access to world information resources and their needs for information products and services.

Резюме

Информационное общество — это общество, в котором большая часть населения занимается производством, хранением, обработкой и передачей информации, а главное, знаний, которые являются ее высшей формой, с использованием современных информационных технологий. Информационное общество — это концепция постиндустриального общества ИК. Это новый исторический этап развития цивилизации, где основным продуктом производства являются информация и знания.

Отношения, характерные для информационного общества, формируются в результате успешного завершения процесса информатизации.

Отличительная особенность ИК:

Возрастающая роль информации и знаний в жизни общества;

увеличение доли информационных коммуникаций, продуктов и услуг в потоке отечественной продукции;

Это создание глобального информационного пространства, обеспечивающего людям эффективное информационное взаимодействие, доступ к мировым информационным ресурсам и их потребности в информационных продуктах и услугах.

Informatsionnoye obshchestvo – eto obshchestvo, v kotorom bol'shaya chast' naseleniya zanimayetsya proizvodstvom, khraneniem, obrabotkoy i peredachey informatsii, a glavnoye, znaniy, kotoryye yavlyayutsya yeye vysshey formoy, s ispol'zovaniyem sovremennykh informatsionnykh tekhnologiy. Informatsionnoye obshchestvo – eto kontseptsiya postindustrial'nogo obshchestva IK. Eto novyy istoricheskiy etap razvitiya tsivilizatsii, gde osnovnym produktom proizvodstva yavlyayutsya informatsiya i znaniya.

Otnosheniya, kharakternyye dlya informatsionnogo obshchestva, formiruyutsya v rezul'tate uspehnogo zaversheniya protsessa informatizatsii.

Otlichitel'naya osobennost' IK:

Vozrastayushchaya rol' informatsii i znaniy v zhizni obshchestva;

увеличение доли информационных коммуникаций, продуктов и услуг в потоке отечественной продукции;

Eto sozdaniye global'nogo informatsionnogo prostranstva, obespechivayushchego lyudyam effektivnoye informatsionnoye vzaimodeystviye, dostup k mirovym informatsionnym resursam i ikh potrebnosti v informatsionnykh produktakh i uslugakh.

Açar sözlər: Informasiya cəmiyyəti, Xarakterik xüsusiyyət

Keywords: Information society, Characteristic feature

Ключевые слова: Информационное общество, Характеристики.

Informasiya cəmiyyəti nədir?

Informasiya cəmiyyətinin nə olması iki müxtəlif formada yanaşmaq olar:

1. Böyük həcmdə və yüksək keyfiyyətli informasiyanın dövr etdiyi cəmiyyət informasiya cəmiyyəti adlanır (yaponiyalı alimlərin yanaşması).

2. Cəmiyyət üzvlərinin əksəriyyəti informasiyanın istehsalı (yaradılması və ya toplanması), saxlanması, emalı və istifadəsi ilə məşğuldursa, belə cəmiyyət informasiya cəmiyyəti adlanır (sosioloji yanaşma).

Informasiya cəmiyyətinə keçid informasiyanın emalı ilə bağlı müasir texnologiyaların yaranması ilə başlamışdır. Bu proses informasiyalaşdırma adlanır.

Cəmiyyətin informasiyalaşdırılması – cəmiyyət üzvlərinin hər birinə lazım olan informasiyanı əldə etmə imkanı verir.

Informasiya cəmiyyətinin inkişaf mərhələləri

Tarix boyu informasiya cəmiyyətin inkişafına ciddi təkan verən müxtəlif hadisələr – informasiya inqilabları baş vermişdir (yazının meydana gəlməsi, kitab çapının kəşfi, elektrik enerjisinin kəşfi, mikroprosessorların ixtirası ilə kompüterlərin geniş yayılması).

İK-nin xarakterik xüsusiyyətləri

- informasiya böhranı aradan qalxır, informasiya axını və informasiya “aclığı” arasındakı ziddiyyət həll olunur;
- informasiyanın başqa resurslardan üstünlüyü təmin edilmiş olur;
- bütün bəşəri sivilizasiya üçün global informasiya mühiti yaranır;

- informasiya və kommunikasiya texnologiyalarından istifadə kütləvi hal alır, sosial və iqtisadi fəaliyyətin yeni formaları yaranır;
- informasiya əmtəyə çevrilir, informasiya və bilik bazarı yaradılır və inkişaf edir;
- inkişafın əsas forması kimi informasiya iqtisadiyyatı formalaşır;
- İKT vasitəsilə hər bir insanın, bütün sivilizasiyaların informasiya resurslarına sərbəst çıxışı reallaşır;
- təhsil sisteminin təkmilləşməsi, beynəlxalq, milli və regional səviyyədə informasiya mübadiləsi sistemlərinin imkanlarının genişlənməsi hesabına peşə və ümumi mədəniyyət səviyyəsi artır;

İC-nin də xarakterik xüsusiyyətləri ilə yanaşı təhlükəli meylləri vardır. Bunları aşağıdakı kimi vermək olar:

- cəmiyyətə kütləvi informasiya vasitələrinin təsiri artır;
- informasiya texnologiyaları təşkilatların və insanların şəxsi həyatına dağıdıcı təsirlər edə bilər;
- informasiya bolluğunda daha dəqiq və keyfiyyətli informasiyanın seçim çətinliyi yaranır;
- insanların böyük əksəriyyətində yeni cəmiyyətə uyğunlaşmaq çətinliklər yaradır.

İnformasiya mədəniyyəti

İnformasiya mədəniyyəti dedikdə informasiya ilə məqsədyönlü işləmə, informasiyanı əldə etmə, emal etmə və saxlama, kompüter texnologiyalarından istifadə bacarığı nəzərdə tutulur.

İnformasiya mədəniyyətinin əsas göstəriciləri:

- Telefon, kompüter kimi qurğularla, şəbəkələr və şəbəkəyə qoşulan avadanlıqlarla (məs: printer) işləmə bacarığı;
- İnformasiya texnologiyalarını öyrənmə bacarığı (məs: ofis proqramlarını);
- Elektor və yazılı mənbələrdən informasiya almaq bacarığı;
- İnformasiyanı anlaşıqlı təqdim etmək və informasiyadan istifadə edə bilmək;
- İnformasiyanın emalının müxtəlif üsullarını bilmək;
- Müxtəlif növ informasiya ilə işləmək bacarığı ...

Kompüter savadlılığı

Kompüter savadlılığı – kompüter və ən çox istifadə edilən proqramlarla, həmçinin öz sahəsinə aid qurğu və proqramlarla işləmə bacarığıdır.

Kompüter savadlılığının göstəriciləri arasında kommunikasiya vasitələrindən istifadə bacarığı xüsusi yer tutur: elektron yazışmalar (e-mail), informasiya əldə etmə bacarığı, hüquqi və etik normaları bilmək, ...

ECDL sertifikatı (European Computer Driving Licence – Avropa kompüter istifadə lisenziyası) – Avropa və ABŞ-da geniş yayılmış bu sertifikat kompüter biliklərini təsdiqləyir.

İnternetdə ünsiyyət

• **İnternet xidmətləri** – İnternet şəbəkəsi vasitəsi ilə göstərilən xidmətlərdir. Bu xidmətləri iki qrupa bölmək olar:

- **İnformasiya xidmətləri** – müxtəlif məlumatların verilməsi (məs: wikipedia)
- **Kommunikasiya xidmətləri** – ünsiyyətin təşkili (e-mail, çat, telekonferans, ...)
- **Chat** – onlayn (online) rejimdə ünsiyyət qurmağa imkan verən kommunikasiya xidmətidir. Anı informasiya mübadiləsini təmin edir. Onlayn və oflayn rejimlər «həmin anda» əlaqənin yaranmasına görə bir-birindən fərqlənir;

• **Gap otaqları** – real zaman anında ünsiyyəti təmin edir. Bu «otaq»larda iştirakçılar bir-birlərinin kompüterlərindəki mətnləri görə bilirlər;

- **İnternet-telefoniya** – internetdə səs siqnallarının (danışığın) ötürülmə texnologiyasıdır;
- **İnternetdə ünsiyyət etikası** – adi həyatda olan etik qaydaların alternativi;
- **E-mail** (elektron poçt) – şəxi və ya işgüzar yazışmalar üçün istifadə edilən internet xidmətidir. Mətnlərədən başqa qoşma fayllar göndərmə imkanına malikdir;

Telekonfrans

- **Telekonfrans** – hər hansı mövzu ətrafında diskusiya aparmaq üçün nəzərdə tutulmuş səsli və görüntülü ünsiyyət vasitəsidir;
- Telekonfrans təşkil etmək üçün vasitələr: Zoom, Cisco TelePresence, Google Hangouts, Skype, GoTuMeeting, TrueConf, Microsoft Teams, ...
- Telekonferans vasitələrindən təhsil sistemində də geniş istifadə olunur.

Elektron Hökumət

- “Elektron Hökumət” (e-Government)- müasir informasiya texnologiyalarından istifadə etməklə dövlət qurumları tərəfindən Azərbaycan Respublikasının ərazisində yaşayan bütün vətəndaşlara, hüquqi və fiziki şəxslərə, xarici vətəndaşlara və vətəndaşlığı olmayan şəxslərə informasiya və e-xidmətlərin göstərilməsinə şərait yaradır.
- Elektron hökumət vasitəsi ilə elektron xidmətlər <https://www.e-gov.az/> saytı vasitəsilə həyata keçirilir.
- Elektron hökumət daxilində münasibətlərin 3 modeli var:
- G2C (government-to-citizen) – hökumət və vətəndaşların qarşılıqlı əlaqəsi;
- G2B (government-to-business) – hökumət və biznesin qarşılıqlı əlaqəsi;
- G2G (government-to-government) – hökumətin müxtəlif qollarının və hökumətin dövlət qulluqçuları ilə qarşılıqlı əlaqəsi

Elektron təhsil

- **Elektron təhsil** (e-təhsil) – internet şəbəkəsindən istifadə edərək müstəqil öyrənmə sistemidir. Bu sistemdə zaman və məkan məhdudiyyəti yoxdur.
- **Müstəqil öyrənmə və Ömürboyu öyrənmə** - müasir dövrdə daim yenilənən texnologiyalar davamlı öyrənmə tələb edir. Həmçinin yeni dünyada uğur qazanmaq istəyən hər kəs müstəqil öyrənməni də bacarmalıdır.
- **Elektron dərslilik** – müəyyən proqramlar vasitəsi ilə istifadə edilə bilən elektron dərslər vasitəsidir (məs: <http://e-derslik.edu.az/>, <https://e-resurs.edu.az/>).
- **Distant təhsil** (uzaqdan təhsil) – təhsilverənlərlə təhsilalanların bir məkanda olmadan əlaqəsini təmin edən sistemdir. Ənənəvi təhsildən əsas fərqi evdən təhsilalma və ya təhsilvermə xüsusiyyətinin olmasıdır.

E-kitabxana

- **E-kitabxana** (elektron kitabxana, rəqəmsal kitabxana və ya virtual kitabxana)– rəqəmsal kitabların (e-kitab yaxud elektron kitab) saxlandığı sistemlərdir.
- E-kitablar kağız daşıyıcılarda yox rəqəmsal daşıyıcılarda (yaddaş qurğularında) yerləşir. Belə kitablara əlçatanlıq internet vasitəsi ilə də təmin edilir.
- Elektron kitablar daha çox .doc, .docx, .txt, .fb2, kimi mətn formatlarında və ya .pdf, .DjVu kimi qrafik formatlarda saxlanılır.
- **e-book** (e-kitab) kompüterləri – kitab oxumaq üçün nəzərdə tutulmuş planşetlərdir. Ekran işıq saçmadığı üçün gözü yormur, məlumatlar elektron kağızda əks olunur.

Elektron səsvermə və e-ticarət

İnternetdən istifadə edərək keçirilən səsvermə elektron səsvermə adlanır. Bu texnologiya bəzi ölkələrdə referendum, bələdiyyə seçkiləri və digər seçkilər zamanı istifadə edilir.

Elektron ticarət (e-ticarət) – internet vasitəsi ilə məhsul və xidmətlərin alqı-satqısıdır. Adətən bu zaman alınan məhsulun və ya xidmətin dəyəti də elektron şəkildə ödənilir.

Məşhur e-ticarət saytları: amazon, ebay, alibaba, Tesco

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ПРИМЕНЕНИЕ МЕТОДОВ МАШИННОГО ОБУЧЕНИЯ ДЛЯ ОБНАРУЖЕНИЯ АНОМАЛИЙ НА ЦЕНТРАЛЬНОМ ПУНКТЕ ПОДГОТОВКИ НЕФТИ

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Аннотация. Центральный пункт подготовки нефти (ЦППН) представляет собой важнейший элемент нефтегазовой инфраструктуры, который обеспечивает очистку и стабилизацию нефти перед её дальнейшей транспортировкой или переработкой.

В данной работе предложено использование методов машинного обучения (ML), таких как Isolation Forest, DBSCAN, которые позволяют эффективно выявлять аномалии и предсказывать возможные отказы оборудования. Это способствует улучшению качества работы системы и снижению затрат. Рассмотренные примеры показывают значительное повышение производительности, снижение затрат и улучшение качества нефти, а также обсуждаются перспективы дальнейшего внедрения искусственного интеллекта в нефтегазовую отрасль.

Ключевые слова: методы машинного обучения, аномалии, отказы оборудования, центральный пункт подготовки нефти.

Введение. Центральный пункт подготовки нефти (ЦППН) является ключевым объектом нефтегазовой отрасли, выполняющим задачи предварительной очистки нефти перед её транспортировкой или переработкой. Основные операции ЦППН включают удаление примесей, обезвоживание и стабилизацию нефти для обеспечения её качества и безопасной транспортировки.

Несмотря на важность этих процессов, ЦППН часто сталкивается с такими проблемами, как нестабильность работы оборудования, наличие скрытых неисправностей, погрешности в измерениях и повышенные эксплуатационные затраты. Сегодня традиционные подходы для анализа данных и выявления неисправностей в оборудовании включают использование фиксированных порогов, математического моделирования и анализа регламентных данных. Однако эти методы оказываются неэффективными при работе с большими объемами данных, которые содержат выбросы или скрытые паттерны, а также при необходимости учитывать сложные взаимосвязи между параметрами.

Для решения этих задач в работе предложено использование методов машинного обучения (ML), таких как Isolation Forest и DBSCAN, которые позволяют:

- Выявлять аномальные данные и отклонения, указывающие на неисправности оборудования, без необходимости ручного определения порогов (Isolation Forest).
- Выполнять кластеризацию технологических данных, выделяя типовые режимы работы и идентифицируя нестандартные или шумовые данные (DBSCAN).

Использование этих методов обосновано их способностью работать с разнородными и шумными данными, характерными для эксплуатационных процессов ЦППН. Актуальность исследования обусловлена необходимостью повышения надёжности работы оборудования, минимизации простоев и обеспечения стабильности технологических процессов.

Цель работы заключается в разработке подхода, основанного на алгоритмах Isolation Forest и DBSCAN, для автоматизации процесса обнаружения аномалий и анализа режимов работы оборудования на ЦППН.

Выбор методов и обоснование применения. Для анализа и повышения эффективности работы ЦППН были выбраны несколько методов машинного обучения, включая Isolation Forest, DBSCAN.

1. Isolation Forest

Обоснование выбора: Isolation Forest был выбран для автоматического обнаружения аномалий, так как он хорошо работает с высокоразмерными наборами данных и не требует предварительной метки для обучения. В отличие от традиционных методов, таких как k-средних или линейной регрессии, Isolation Forest изолирует аномалии путем построения множества случайных деревьев, что делает его эффективным при поиске редких отклонений.

Сравнение с другими методами: по сравнению с методами на основе плотности (например, LOF), Isolation Forest быстрее и проще в реализации, что особенно важно при работе с большими объемами данных [1,2].

2. DBSCAN (Density-Based Spatial Clustering of Applications with Noise)

Обоснование выбора: DBSCAN был выбран для кластеризации данных, так как он способен выделять кластеры любой формы и эффективно работает в присутствии выбросов (шумовых точек). Это делает его идеальным для анализа рабочих режимов оборудования, где данные могут быть разреженными и содержать шум.

Сравнение с другими методами кластеризации: в отличие от методов, таких как k-средних, DBSCAN не требует заранее задавать количество кластеров и может обрабатывать сложные формы данных. Это дает ему преимущество при анализе технологических процессов, где заранее неизвестно, сколько режимов работы существует [1,2].

3. Среда Visual Studio Code

Обеспечивает удобные инструменты для написания, выполнения и отладки кода на Python, а также интеграцию с различными расширениями для поддержки работы с библиотеками данных и машинного обучения.

Для анализа данных и построения моделей использовались следующие библиотеки:

- Pandas для работы с таблицами и обработки данных.
- NumPy для выполнения операций с массивами и числовыми данными.
- Scikit-learn для реализации алгоритмов машинного обучения, таких как

Isolation Forest для обнаружения аномалий, DBSCAN для кластеризации данных, а также GradientBoostingRegressor для прогнозирования.

- Matplotlib и Seaborn для визуализации результатов, включая построение графиков после анализа и кластеризации данных.

Использование Visual Studio Code с интеграцией перечисленных библиотек позволило эффективно обрабатывать данные, анализировать их и создавать модели машинного обучения для предсказания и анализа параметров центрального пункта подготовки нефти [1,2].

Данные для обучения и анализа. В исследовании использовался набор данных (датасет), который включает записи о технологических параметрах работы ЦППН. Датасет содержит ключевые показатели, позволяющие анализировать эксплуатационные процессы,

выявлять аномалии и строить прогнозные модели для предотвращения потенциальных сбоев оборудования.

Таблица с исходными данными содержит следующие параметры:

- Плотность нефти: важный показатель качества сырья.
- Давление: характеризует условия работы оборудования и стабильность технологического процесса.
- Температура: влияет на физико-химические процессы; изменения температуры могут указывать на отклонения от нормального состояния.
- Массовый расход нефти: целевая переменная, используемая для прогнозирования.

Датасет был получен с помощью систем автоматизированного сбора данных, установленных на ЦППН. Сенсоры и датчики фиксировали параметры с высокой частотой, что обеспечивало получение детализированных временных рядов. Эти данные были дополнительно обработаны для использования в моделях машинного обучения (таблица 1).

Основные характеристики данных:

- Объем данных: значительный, что обеспечивает надежное обучение моделей.
- Частота сбора данных: высокая, что позволяет проводить точный временной анализ.
- Формат данных: табличный, с временными метками и измерениями параметров.

Таблица 1 – Данные с узла сдачи (Dataset)

Объект	Дата время	Плотность	Давление	Температура	Массовый расход нефти
Узел сдачи	2024-02-29 06:01:03	873.68	0.087	7.62	3342.05
Узел сдачи	2024-02-29 04:01:03	872.34	0.086	7.99	2392.38
Узел сдачи	2024-02-29 02:01:03	872.79	0.085	8.53	3629.57

Применение данных из датасета позволило использовать методы машинного обучения, такие как Isolation Forest и DBSCAN для обнаружения аномалий. Эти подходы обеспечивают повышение точности анализа и помогают улучшить эксплуатационные характеристики узла сдачи нефти, повышая его надежность и снижая затраты

Результаты исследования. Для обработки данных узла сдачи нефти была разработана блок-схема, представленная на рисунке 1.

На блок-схеме показаны ключевые этапы: начиная со сбора данных и их очистки, масштабирования и анализа, заканчивая визуализацией результатов. Первоначально данные собираются с сенсоров и датчиков узла сдачи нефти. Затем временные метки преобразуются в формат DateTime для корректной привязки данных ко времени. На следующем этапе проводится выбор ключевых признаков, таких как давление, температура, плотность и массовый расход нефти, что позволяет сфокусироваться на наиболее значимых параметрах.

Данные подвергаются удалению выбросов с использованием метода IQR, а затем масштабируются с помощью StandardScaler. Это необходимо для приведения признаков к единой шкале, что особенно важно для алгоритмов машинного обучения. После этого применяется метод главных компонент (PCA), который упрощает восприятие данных и

уменьшает их размерность, сохраняя ключевую информацию. На следующих этапах проводятся выявление аномалий с помощью алгоритма Isolation Forest и кластеризация методом DBSCAN. Финальные этапы включают обучение модели прогнозирования Gradient Boosting, сглаживание прогнозов и визуализацию полученных данных [3, 4].

На этапе предварительной обработки данных, описанном в блок-схеме, были построены графики, отражающие изменения ключевых параметров узла сдачи нефти. Графики плотности, давления, температуры и массового расхода нефти дают возможность визуализировать временные зависимости и выявить закономерности в изменении параметров. Эти данные были получены после этапа очистки и масштабирования, что позволило избежать влияния выбросов и сделать графики более точными.

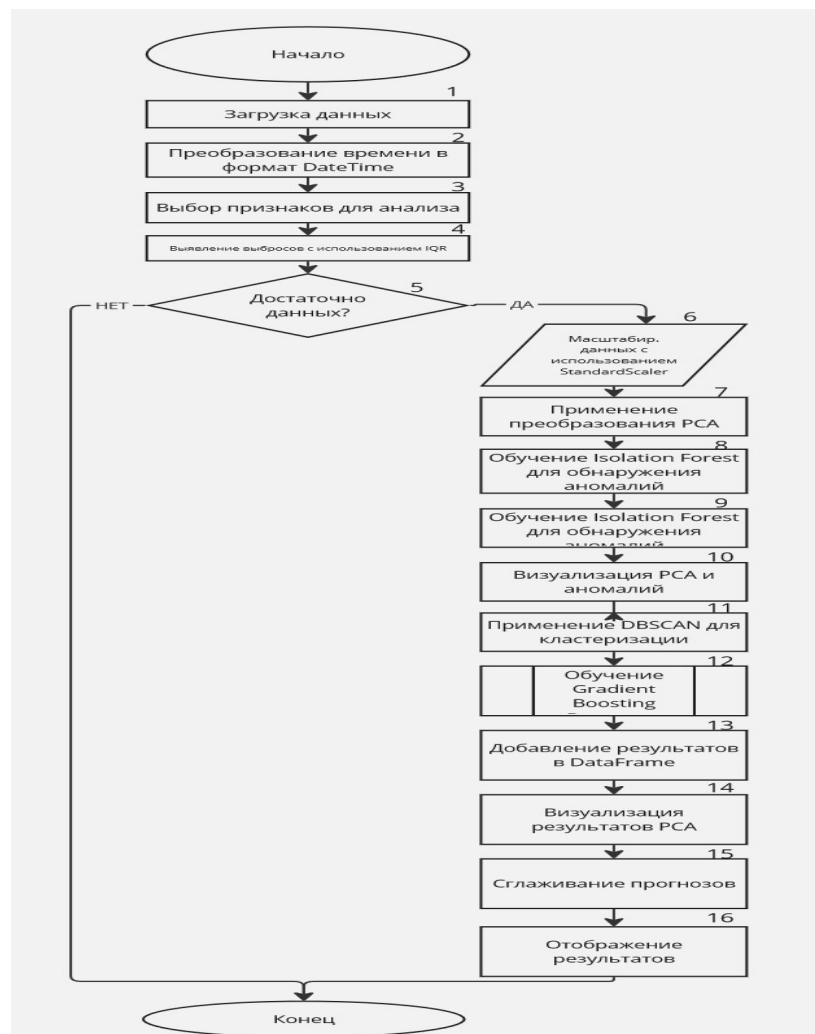


Рисунок 1 — Блок-схема анализа данных

Рисунок 2 показывает, как параметры узла сдачи изменяются с течением времени. Плотность и температура демонстрируют относительную стабильность, тогда как массовый расход нефти характеризуется колебаниями, которые требуют более детального анализа.

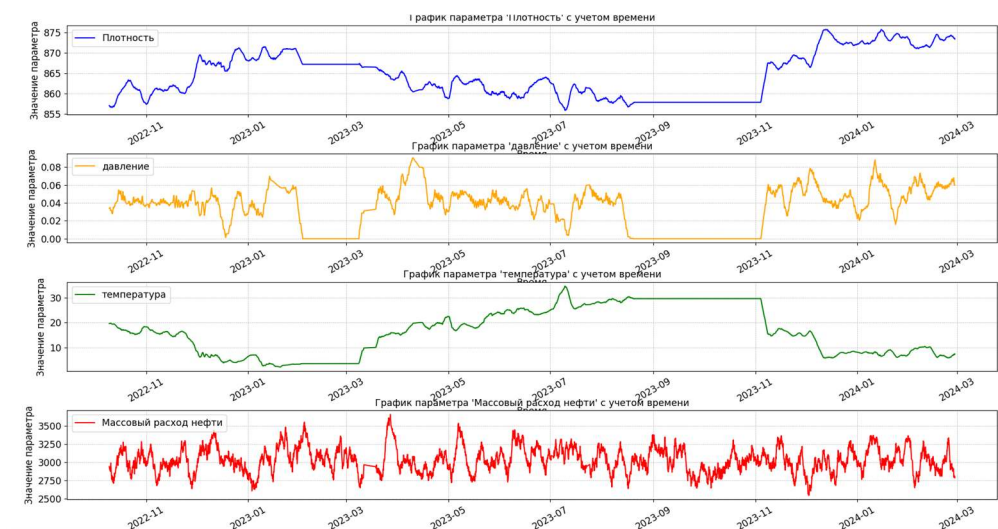


Рисунок 2 — Графики изменений технологических параметров узла ЦППН

Выявление аномалий. Выявление аномалий в данных проводилось с использованием алгоритма Isolation Forest. На рисунке 3 представлены результаты анализа, где красные точки обозначают нормальные данные, а синие — аномалии. Визуализация проводилась с использованием метода главных компонент (PCA), что позволило упростить восприятие многомерных данных. Эти результаты позволяют оператору заранее обнаружить проблемные точки в данных и принять меры по их устранению.

PCA преобразует исходные данные в новое пространство с меньшей размерностью, где:

1. *PCA Component 1* представляет направление максимальной дисперсии данных. Это означает, что первая компонента описывает наибольшую возможную вариацию в данных. Комбинация 40% плотности, 30% давления, 20% температуры и 10% массового расхода нефти.
2. *PCA Component 2* описывает следующую по величине вариацию, которая не коррелирует с первой компонентой. Включает 25% плотности, 50% температуры, 15% давления и 10% массового расхода.

Использование PCA оправдано в этом случае по нескольким причинам:

1. *Уменьшение размерности:*
 - В исходных данных 4 признака (плотность, давление, температура, массовый расход).
 - PCA сокращает размерность до 2, сохраняя при этом максимальную возможную информацию (дисперсию).
2. *Визуализация:*
 - Мы не можем изобразить многомерные данные на 2D-графике. Преобразование через PCA позволяет сделать это.
3. *Упрощение анализа:*
 - PCA-компоненты отделяют основные зависимости в данных, убирая корреляции между исходными параметрами.

Таким образом, PCA-компоненты — это линейные комбинации исходных параметров (плотности, давления, температуры и массового расхода нефти), которые упрощают структуру данных [3,4].

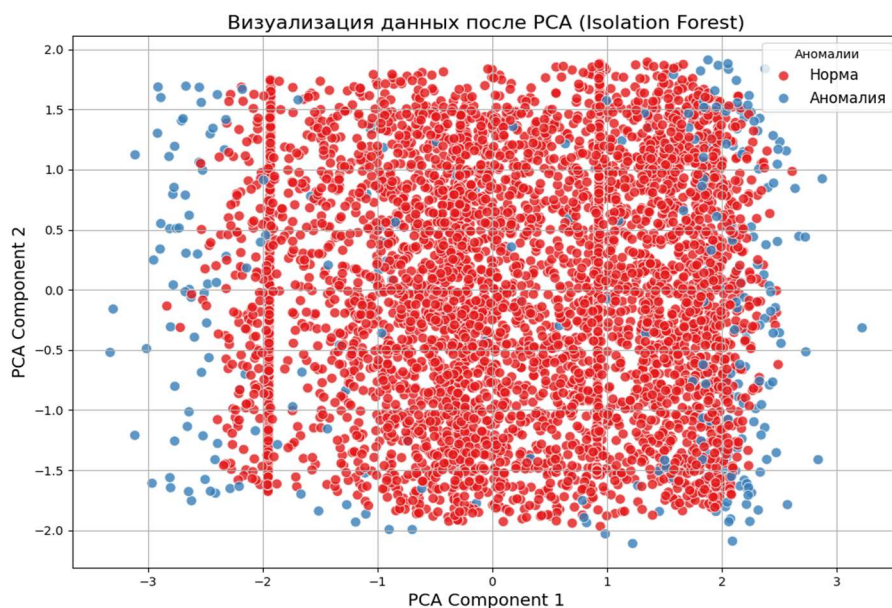


Рисунок 3 — Результаты анализа методом Isolation Forest

Кластеризация данных. Для дальнейшего анализа данных применялся метод DBSCAN, который группирует точки в плотные кластеры и выделяет шумовые точки, не принадлежащие ни одной группе. Эти кластеры позволяют глубже понять структуру данных и определить характерные режимы работы оборудования.

Результаты кластеризации представлены на рисунке 4, где каждая группа данных (кластер) отображена различным цветом. Шумовые точки, которые алгоритм идентифицировал как отклонения, выделены отдельно. Этот подход даёт операторам возможность анализировать режимы работы системы и их отклонения от нормы.

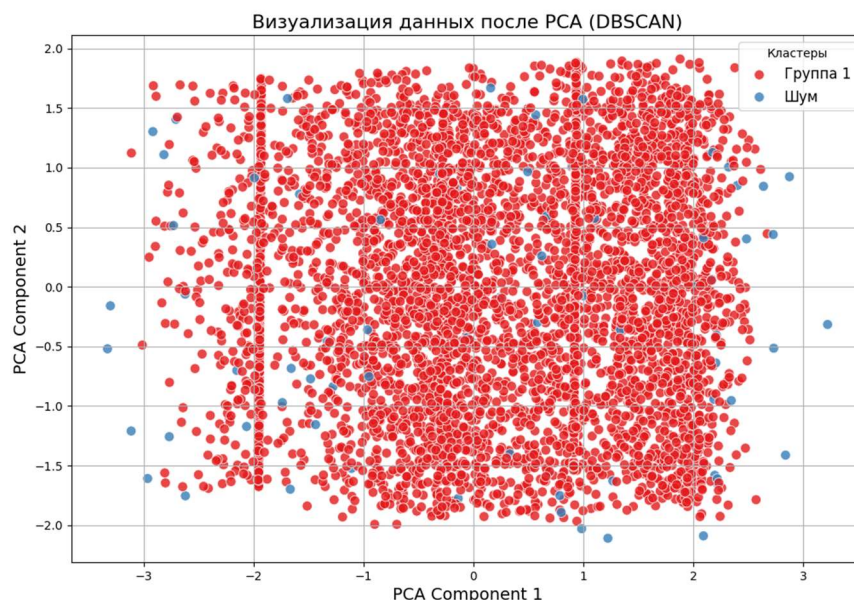


Рисунок 4 — Результаты кластеризации методом DBSCAN

Заключение. В данной работе предложены и исследованы современные методы машинного обучения, такие как Isolation Forest и DBSCAN, для повышения эффективности работы центрального пункта подготовки нефти (ЦППН). Эти методы продемонстрировали высокую эффективность в задачах обнаружения аномалий и кластеризации технологических данных, что позволило улучшить эксплуатационные характеристики системы.

Основные результаты исследования включают:

Выявление аномалий: Применение алгоритма Isolation Forest позволило обнаружить скрытые аномалии в данных, указывающие на возможные неисправности оборудования, без необходимости предварительной настройки пороговых значений.

Кластеризация данных: Метод DBSCAN показал себя как эффективный инструмент для анализа режимов работы оборудования и выделения выбросов в данных, что способствует более глубокому пониманию процессов на ЦППН.

Использование автоматизированного анализа данных: Интеграция методов машинного обучения с современными инструментами разработки, такими как TensorFlow и библиотеки Python, позволила значительно сократить время обработки данных и повысить точность анализа.

Практическая значимость исследования заключается в повышении надёжности и стабильности эксплуатации оборудования, минимизации простоев и снижении эксплуатационных затрат. Применение разработанных методов на ЦППН открывает новые возможности для построения более интеллектуальных систем управления технологическими процессами.

Перспективы дальнейших исследований включают:

- Расширение набора данных для анализа других параметров технологических процессов.

- Применение методов машинного обучения к прогнозированию эксплуатационных характеристик и диагностики неисправностей в режиме реального времени.

- Интеграция предложенных решений в промышленную SCADA-систему для повышения эффективности управления ЦППН.

Таким образом, результаты исследования подтверждают актуальность и высокую эффективность использования машинного обучения для оптимизации технологических процессов в нефтегазовой отрасли.

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Dynamic characteristics of a WED with an asynchronous generator with a change of voltage at the output of the stator winding according to changes in wind speed

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Key words: wind engine, wind wheel, stator loop, wind electric device, wind flood, stator current, torque, period, wind energy.

The article examines the construction of the dynamic characteristics of a WED with an asynchronous generator during startup with a change in the voltage at the output of the stator winding according to a change in wind speed, then a comparison was made with the characteristics at a constant voltage. The analysis revealed that regulating the voltage at the output of the stator winding significantly improves the technical and economic indicators of wind turbines.

Today, renewable energy resources are the cleanest, most promising type of energy. Currently, experts from different countries are looking very carefully at renewable energy sources. This is due to the fact that the traditional sources of energy can be exhausted sooner or later, and the production of electricity with their use as fuel seriously damages the ecology of the environment. On January 13, 2022, the groundbreaking ceremony of the "Khizi-Absheron" wind power plant with a capacity of 240 MW was held. The ceremony was held with the direct participation of our great president Ilham Aliyev. This wind farm will be built by Saudi Arabia's CCWA Power company. The energy produced by this wind power plant will allow to save 220 billion m³ of natural gas and prevent 40 thousand tons of carbon dioxide released into the atmosphere during the year by supplying energy to 300 thousand houses. In addition, at the same time, on March 15 of the same year, the foundation laying ceremony of the Karabakh solar power plant with an installed capacity of 230 MW was held. The station will be built by the "Masdar" company of the United Arab Emirates. This station will generate 500 million kWh of electricity per year, as a result of which 110 million m³ of natural gas will be saved, and 200,000 tons of harmful mixtures will be avoided.

In the future, Azerbaijan will not be saved only by the implementation of these projects, as it insists on the implementation of similar projects using renewable energy sources until 2030, because the renewable energy potential of Azerbaijan allows it, so the renewable energy potential

of Azerbaijan 27 GW, including 3 GW of wind, 23 GW of solar energy, 380 MW of biomass energy, and 520 MW of mountain river energy during the year.

Today, approximately 7954 MW of electricity is produced in Azerbaijan, of which 134.5 MW is generated from renewable energy sources, including large and small powerful hydroelectric power plants.

"Green energy" in Azerbaijan has a high potential to produce electricity using wind and solar energy, especially in the freed Karabakh and eastern Zangezur territories. Kalbajar, Lachin, Gubadli, Zangilan, Jabrayil and Fuzuli regions are areas with solar energy potential. The territories of Kalbajar and Lachin regions are also regions with high wind energy potential.

Therefore, in the future, BP company plans to build a solar power plant with a capacity of 240 MW in Jabrayil.

The Republic of Azerbaijan has set a goal to increase energy production using renewable energy sources from 17% to 25% of the country's total production capacity by 2015 and to 30% by 2030.

Wind energy is the most promising and rapidly developing direction in non-traditional energy. Back in 2010, the total capacity of wind energy installations worldwide was 197 GW, which was 2.5% of the demand for electricity. In 2020, the total capacity of these installations was 744 GW, which in turn met 7% of the world's demand. From year to year, this number will increase with the increase of state investments made by leading countries in this field. Scandinavian countries such as Denmark, Sweden, and Norway actively use offshore wind power plants, and as a result, the energy produced in this way in these countries constitutes a significant part of the energy of power plants using traditional resources. For example, in 2015, wind energy provided 42% of the country's energy demand in Denmark, and in 2020, most of Germany's electricity demand was provided by wind and solar plants. Therefore, the technology of using renewable, alternative energy sources is considered the most promising direction.

Currently, synchronous and asynchronous generators are widely used in wind power plants. The use of asynchronous machines as generators in WED is characterized by its advantages such as its small mass, simplicity of service, reliability, and the possibility of synchronizing with the network.

In the dynamic mode of the WED with an asynchronous generator, i.e., during the commissioning process, it is necessary to solve a number of issues, one of which is to prevent dangerous dynamic loads. The research can be carried out by carrying out the commissioning of the wind power plant with an asynchronous generator in two variants. The first of these options is performed by adjusting the voltage at the output of the asynchronous generator stator loop proportional to the wind speed, in the case of the wind power unit with an asynchronous generator working on a strong electric network, at a constant value of $U = 1.0U_n$, and in the second option, unlike the first option. The characteristics obtained as a result of the research on the second option are given in figure 1. This characteristic is based on the values given in table 2. The characteristic given in Figure 2 is at a constant value of the voltage, i.e. $U = 1.0U_{nom}$. based on the values given in table 1.

Table 1.

Time;rad	1100	1150	1200	1250	1300	1350	1400	1450	1500
Wind speed;V m/s	10	9,9	12	10,7	8,9	8,3	10,6	13,5	14
Moment [n.v.]	0,7	0,69	0,99	0,8	0,56	0,48	0,78	1,28	1,4
Stator current; [n.v.]	0,78	0,78	1,09	0,9	0,65	0,57	0,86	1,41	1,56

Table 1 follows

Time;rad.	1550	1600	1650	1700	1750	1800	1850	1900	1950
Wind speed;V m/s	13,6	12,5	12	11,8	10,6	9,9	8,2	6,3	< 4
Moment [n.v.]	1,29	1.087	0,99	0,98	0,78	0,68	0,47	0,28	0,07
Stator current; [n.v.]	1,44	1,2	1,09	0,98	0,87	0,77	0,55	0,37	0,25

Table 1 follows

Time;rad.	2000	2050	2100	2150	2200	2250
Wind speed;V.m/s	< 4	5,6	7,7	10,2	10	10
Moment,[n.v.]	0,01	0,22	0,42	0,73	0,69	0,7
Stator current;[n.v.]	0,24	0,34	0,51	0,81	0,77	0,78

The results obtained by adjusting the voltage at the stator winding output of the asynchronous generator in proportion to the wind speed are given in table 2.

Table 2.

Time;rad	1100	1150	1200	1250	1300	1350	1400	1450	1500
Moment [n.v.]	0,69	0,7	1,05	0,77	0,55	0,48	0,8	1,32	1,41
Stator current; [n.v.]	0,91	0,92	1,18	0,93	0,78	0,63	0,87	1,1	1,11
Real Experience d Voltage	0,83	0,83	1	0,89	0,77	0,84	1,39 1	1,34 1	1,41 1

Table 2 follows

Time;rad.	1550	1600	1650	1700	1750	1800	1850	1900	1950
Moment [n.v.]	1,29	1,07	0,98	1,13	0,78	0,68	0,46	0,26	0,07
Stator current; [n.v.]	1,05	0,95	0,91	0,88	0,81	0,75	0,6	0,44	0,22
Real Experience d Voltage	1,36 1	1,25 1	1,2 1	0,86	1	1	0,84	0,65	0,37

Table 2 follows

Time;rad.	2000	2050	2100	2150	2150	2200
Moment [n.v.]	0,0002	0,17	0,45	0,76	0,68	0,7
Stator current; [n.v.]	0,04	0,4	0,67	0,87	0,77	0,78
Experienced Voltage	0	0,53	0,75	1	1	1

It can be seen from the change curves of the device parameters, i.e. torque, stator current, voltage given in Figure 1, that the asynchronous machine switches to the generator mode starting from 930 rad. From the start of the device up to 1150 rad, the tension remains unchanged and is equal to 0.83 Un. After 1150 rad, the voltage supplied to the stator winding of the generator is adjusted in proportion to the change in wind speed by changing the value of the torque according to the change in wind speed. At the "peak" value of the torque equal to 1.41 Mn, the voltage is limited to a value equal to 1.0Us, and the stator current reaches its "peak" value at 1.34A. This value of the current corresponds to the time period of 1410 rad. in picture 1. At zero torque, the stator current reaches its minimum value of 0.04A, which is 2000 rad in Figure 1. corresponds to the time period.

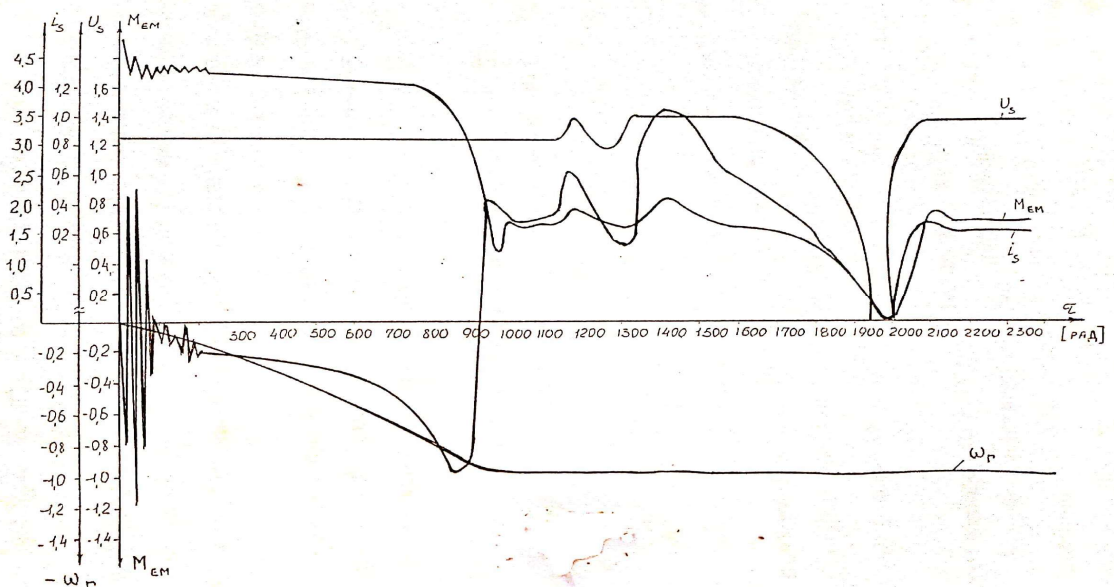


Figure 1. Characteristics of WED in dynamic mode when $U_m = U_0 + k_u \tau$ and $U = 0 \div 1.15 V_{acc}$

The effectiveness of the technical and economic indicators of the proposed second option compared to the first option can be seen from the comparative analysis of the dynamic characteristics obtained from the research conducted on these options.

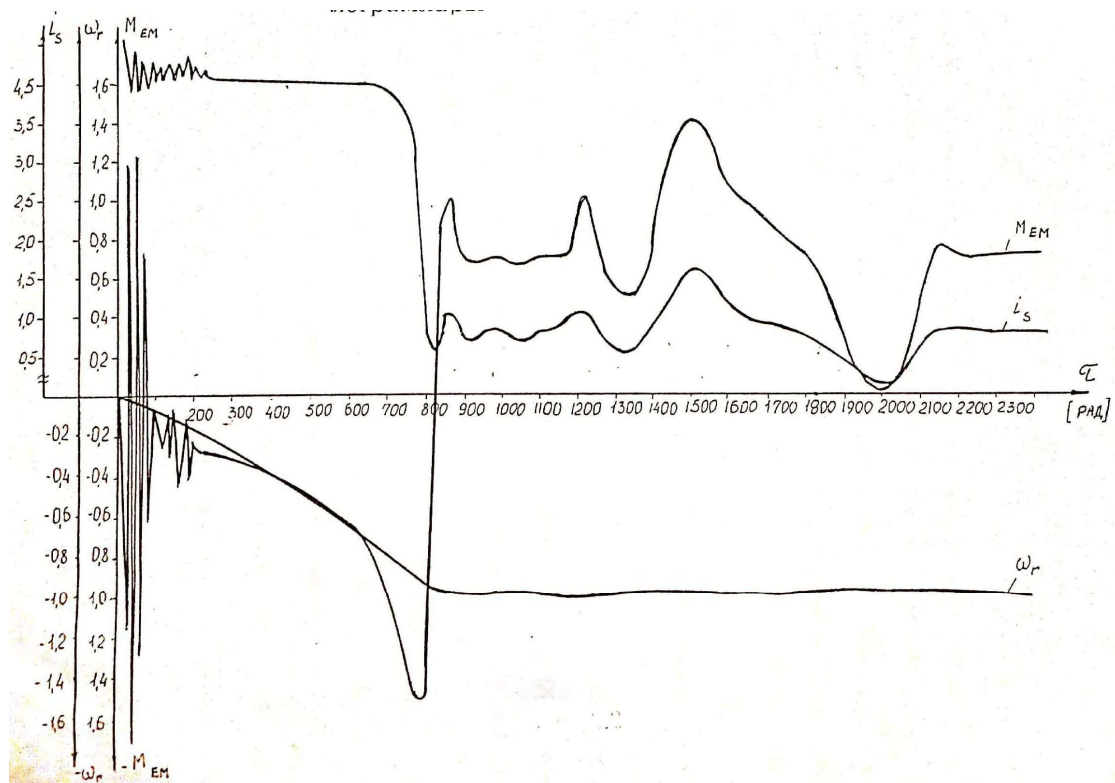


Figure 2. Characteristics of WED in dynamic mode when $U_m = 1.0 = \text{const}$

From the characteristics shown in Figures 1 and 2, it can be seen that in the first option, when the voltage is not regulated, that is, when $U_m = 1.0 U_n$, the time to switch the machine to the generator mode is 810 rad., and the voltage is $U = 0.83 U_n$, and in the second option, the time to switch to the generator mode is 920 rad.

The analysis of individual parts of the transition process, which occurs after 1100 rad, with the change of the driving force, shows that the "peak" values of the moment in the first and second variants are equal to $1.4 M_n$. In this case, the time period in pictures 1 and 2 is 1500 rad. The stator

current of the generator is correspondingly equal to 1.56 A , which corresponds to 1500 rad in Figure 1. When the voltage at the output of the stator loop is regulated according to the law of wind speed, the value of the moment is equal to $1.1M_n$, which is 1450 rad. corresponds to the time period. In the first option, i.e. when the voltage is not adjusted, the stator current is equal to 0.24 A at the zero value of the moment, in the second option, i.e. when the voltage is adjusted proportionally to the wind speed, the stator current at the zero value of the moment reaches its minimum value equal to 0.04 A . It should be noted that in this case the voltage is equal to zero. From the comparison of these two characteristics, the effect of adjusting the voltage at the output of the stator winding of the asynchronous generator with a regularity proportional to the rate of change of the wind speed is clearly visible.

The use of regulation of the voltage at the output of the stator winding of the asynchronous generator with a law proportional to the change in wind speed allows to significantly increase the technical and economic indicators of the wind power plant with an asynchronous generator in dynamic modes.

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The Transformative Influence of Artificial Intelligence in 2024: Innovations, Impacts, and Challenges

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Abstract

The year 2024 marks a transformative phase in the evolution of Artificial Intelligence (AI). This technology has revolutionized industries such as healthcare, education, and environmental management, demonstrating unparalleled potential to address global challenges. However, these advancements bring ethical concerns, governance issues, and societal disruptions that require urgent attention. This paper explores the technological innovations driving AI's development, its profound societal impacts, and the challenges it faces in implementation and regulation. Through in-depth analyses and case studies, the article highlights both the promise and perils of AI. It calls for inclusive policymaking, ethical frameworks, and international collaboration to harness AI's transformative potential responsibly and equitably.

Keywords:

Artificial Intelligence, technological innovation, societal transformation, AI ethics, generative models, automation, sustainability, governance

1. Introduction

Artificial Intelligence (AI) has become one of the most transformative forces of the 21st century, influencing nearly every aspect of human life. In 2024, AI technologies have advanced to the point where they are integrated seamlessly into industries, governance systems, and personal lives. From generative models that create art and music to predictive analytics tools that optimize supply chains, AI has redefined the boundaries of what is possible.

However, this rapid integration raises profound questions about ethics, equity, and governance. While AI presents immense opportunities to solve global challenges such as climate change and disease outbreaks, it also introduces risks of misuse, algorithmic bias, and economic disruption. The disparity in access to AI technologies between developed and developing nations further complicates its adoption.

This paper provides a comprehensive analysis of AI's innovations, societal impacts, and challenges in 2024. By examining key advancements, exploring their effects on various sectors, and addressing the hurdles in AI governance, this article aims to offer insights into how AI can be harnessed for the greater good.

2. Innovations in AI Technologies in 2024

2.1 Generative AI: Redefining Creativity and Innovation

Generative AI represents one of the most groundbreaking advancements in artificial intelligence. These models, including GPT-4 and DALL-E 2, have revolutionized content creation by enabling machines to generate text, images, music, and videos that mimic human creativity. The

capabilities of generative AI are being leveraged across industries, from entertainment and marketing to education and research.

In the entertainment sector, generative AI is driving the production of personalized content. For instance, video game developers use AI to create dynamic storylines tailored to individual players. Similarly, filmmakers employ AI to generate realistic visual effects and scripts, significantly reducing production costs. Marketing professionals benefit from AI-generated advertisements that adapt to consumer preferences in real-time, enhancing engagement and conversion rates.

Beyond creativity, generative AI has become a powerful tool in scientific discovery. Researchers use these models to simulate molecular interactions, predict protein folding, and design new materials for renewable energy applications. Despite its potential, generative AI also raises concerns about ethical misuse. The proliferation of deepfake videos and AI-generated misinformation highlights the need for robust regulatory frameworks to ensure responsible use.

2.2 Advancements in AI-Driven Healthcare

The healthcare industry has been a primary beneficiary of AI advancements. In 2024, AI-powered diagnostic tools have become indispensable in medical practice. Algorithms analyzing medical images now outperform human radiologists in detecting diseases such as cancer and cardiovascular conditions, enabling earlier intervention and improved outcomes.

AI's role extends to treatment planning and personalized medicine. By analyzing genetic data, lifestyle factors, and patient history, AI systems generate tailored treatment plans that address individual needs. This approach has proven particularly effective in managing chronic illnesses and rare diseases.

Operational efficiencies in healthcare have also improved with AI. Predictive models optimize hospital resource allocation by forecasting patient admissions and equipment usage. AI-driven telemedicine platforms have expanded access to healthcare in underserved regions, connecting patients with specialists regardless of geographic barriers. However, the reliance on data-intensive algorithms raises concerns about privacy, security, and potential biases in AI systems.

2.3 AI for Environmental Sustainability

AI has emerged as a critical tool in addressing environmental challenges. In 2024, AI-driven solutions are being used to combat climate change, optimize resource utilization, and promote biodiversity conservation. Predictive analytics models enable governments to monitor deforestation, track wildlife populations, and assess the impact of human activities on ecosystems.

In renewable energy management, AI optimizes the generation and distribution of electricity from solar and wind sources. These systems predict energy demand and adjust supply in real-time, reducing waste and minimizing reliance on fossil fuels. Similarly, in agriculture, AI-powered drones and sensors monitor crop health, enabling precision farming techniques that enhance productivity and reduce environmental impact.

Despite its potential, the adoption of AI in sustainability efforts faces barriers. Developing nations often lack the infrastructure and expertise needed to implement AI-driven solutions. Ensuring equitable access to these technologies requires targeted investments and international collaboration.

3. Societal Impacts of AI

3.1 Workforce Transformation: Opportunities and Disruptions

AI is reshaping the global workforce by automating repetitive tasks and creating new opportunities in technology-driven industries. While automation increases efficiency and reduces costs, it also displaces workers in traditional roles such as manufacturing, logistics, and customer service.

At the same time, AI has created demand for new skills in fields such as data science, robotics, and AI ethics. Reskilling programs have become a priority for governments and businesses seeking to prepare workers for the AI economy. Online platforms offering courses in AI and machine learning have democratized access to education, enabling individuals to transition to high-demand careers.

However, the impact of AI on the workforce is not uniform. High-income nations are better equipped to adapt to these changes, while low-income countries face challenges in accessing resources and training programs. Addressing these disparities requires inclusive policies that promote digital literacy and equitable economic development.

4. Challenges in AI Development and Deployment

Artificial Intelligence, despite its transformative capabilities, is fraught with challenges that hinder its development, deployment, and acceptance. These challenges span ethical dilemmas, governance issues, technological limitations, and socioeconomic disparities. Addressing these hurdles is essential to ensure AI is leveraged responsibly and equitably across the globe.

4.1 Ethical and Governance Issues

The ethical implications of AI technologies have become a focal point of global debates in 2024. At the heart of these concerns are issues such as algorithmic bias, data privacy, transparency, and the potential misuse of AI in sensitive domains like surveillance and military operations. Algorithmic bias, for instance, can perpetuate social inequalities if the data used to train AI systems reflects historical prejudices. Biased algorithms in hiring processes, credit scoring, or policing systems disproportionately impact marginalized communities, exacerbating societal divides.

Another pressing issue is the lack of transparency, often referred to as the "black box" problem. Complex AI models, particularly those utilizing deep learning, make decisions in ways that are difficult for even their developers to understand. This opacity raises concerns about accountability, especially in high-stakes scenarios such as medical diagnoses or legal judgments.

Governance frameworks for AI remain inconsistent across regions. While some countries have implemented robust policies to regulate AI development and deployment, others lack the infrastructure to do so. For instance, the European Union has introduced the AI Act to establish comprehensive regulations, whereas many developing nations are still grappling with the basics of AI literacy. International cooperation is essential to create standardized policies that promote ethical AI use while fostering innovation.

The potential misuse of AI in surveillance and warfare adds another layer of complexity. AI-powered surveillance systems, often deployed under the guise of public safety, risk violating individual privacy and enabling authoritarian control. Similarly, the use of AI in autonomous weapons raises moral questions about the delegation of life-and-death decisions to machines. These issues underscore the urgent need for global treaties and ethical guidelines to govern AI applications.

4.2 Technological Constraints

Despite its advancements, AI technology is not without its limitations. One significant constraint is the reliance on vast amounts of high-quality data. Many AI systems require extensive datasets for training, which are often unavailable or inaccessible in certain domains. This limitation is particularly pronounced in fields like healthcare, where data privacy regulations restrict the sharing of sensitive information.

Moreover, the computational power required to develop and deploy advanced AI models poses significant challenges. Training large-scale models, such as GPT-4, consumes enormous amounts of energy and computing resources, raising concerns about environmental sustainability.

Efforts to develop more energy-efficient algorithms are ongoing, but the pace of innovation has yet to fully address these issues.

Another technical challenge is the vulnerability of AI systems to adversarial attacks. By subtly altering input data, malicious actors can manipulate AI models to produce incorrect or harmful outputs. For example, an attacker could tamper with an autonomous vehicle's image recognition system, causing it to misidentify road signs. Enhancing the robustness and security of AI systems is critical to mitigating these risks.

4.3 Socioeconomic Inequalities

AI has the potential to exacerbate existing socioeconomic disparities if not implemented inclusively. While developed nations reap the benefits of AI-driven innovation, developing countries often lack the resources and infrastructure to participate in the AI revolution. This digital divide is evident in areas such as education, healthcare, and access to technology.

For instance, AI-powered educational platforms are transforming learning experiences in wealthier regions, while schools in underprivileged areas struggle to access basic digital tools. Similarly, AI's role in healthcare is largely limited to countries with advanced infrastructure, leaving billions without access to its life-saving potential.

Bridging these gaps requires targeted investments in AI education, infrastructure, and capacity-building initiatives. International organizations and tech companies must collaborate to ensure that the benefits of AI are distributed equitably. This includes developing low-cost AI solutions tailored to the needs of underserved communities and fostering knowledge-sharing between nations.

5. Case Studies of AI Transformations

Examining real-world applications of AI reveals both its transformative potential and the challenges associated with its deployment. This section highlights two critical areas where AI has significantly impacted society in 2024.

5.1 AI in Public Health Crises

The role of AI in managing public health crises has become increasingly apparent, particularly in the wake of global pandemics such as COVID-19. In 2024, AI-driven tools are being utilized to predict disease outbreaks, optimize vaccine distribution, and streamline healthcare delivery. For example, machine learning models analyze epidemiological data to identify potential hotspots for disease transmission, enabling governments to take proactive measures.

AI has also revolutionized vaccine development. Traditional methods of vaccine creation often take years, but AI-powered systems can identify potential candidates in a matter of weeks by analyzing vast datasets of genetic and viral information. This accelerated process played a crucial role in combating COVID-19 and has since been adapted to address emerging health threats.

In resource-constrained settings, AI-powered telemedicine platforms connect patients with healthcare providers, overcoming geographical barriers. For instance, in rural areas of sub-Saharan Africa, AI-enabled diagnostic tools are used to detect diseases like malaria and tuberculosis with high accuracy, reducing the burden on overworked medical staff.

Despite these advancements, challenges remain in ensuring equitable access to AI-driven healthcare solutions. High costs, limited internet connectivity, and a lack of technical expertise often prevent underserved communities from benefiting fully. Addressing these barriers is essential to realize AI's potential in global health.

5.2 AI in Autonomous Transportation

Autonomous transportation is another area where AI has had a profound impact. In 2024, self-driving vehicles have become increasingly common, offering the promise of safer roads, reduced emissions, and greater mobility for individuals with disabilities. AI systems enable these

vehicles to navigate complex environments by processing data from cameras, sensors, and GPS systems in real time.

In logistics, autonomous trucks are streamlining supply chains by reducing delivery times and minimizing operational costs. Companies like Tesla and Waymo have pioneered the development of self-driving freight vehicles, transforming the transportation industry. However, the adoption of autonomous vehicles is not without challenges.

Regulatory frameworks for self-driving cars remain fragmented, with different countries adopting varying standards for safety and liability. Ethical dilemmas also arise when autonomous systems face scenarios requiring split-second decisions, such as choosing between the safety of passengers and pedestrians. These issues highlight the need for comprehensive policies and ethical guidelines to govern the deployment of autonomous transportation systems.

6. Recommendations for Responsible AI Adoption

To harness the benefits of AI while mitigating its risks, stakeholders must adopt a multifaceted approach that prioritizes ethical innovation, inclusivity, and transparency. The following recommendations outline key strategies for achieving these goals.

6.1 Establish Robust Governance Frameworks

Governments and international organizations should collaborate to develop standardized regulations for AI development and deployment. These frameworks must address issues such as data privacy, algorithmic transparency, and accountability. Creating global treaties on the ethical use of AI, particularly in sensitive areas like surveillance and military applications, is essential to prevent misuse.

6.2 Promote Digital Literacy and Education

Investing in digital literacy programs is critical to preparing individuals for an AI-driven future. Educational institutions should incorporate AI-related curricula at all levels, from primary schools to universities. Additionally, online platforms offering accessible courses in AI and machine learning can democratize access to education, empowering individuals to participate in the AI economy.

6.3 Foster Inclusive Innovation

Ensuring that AI technologies benefit all members of society requires a focus on inclusivity. Developers should prioritize designing AI systems that are affordable, accessible, and culturally relevant. Policymakers should incentivize companies to create solutions tailored to the needs of underserved communities, bridging the digital divide.

7. Future Directions and Conclusions

The trajectory of Artificial Intelligence (AI) in 2024 is characterized by both remarkable progress and pressing challenges. As AI continues to reshape industries, societies, and global systems, stakeholders must prioritize long-term strategies to ensure its benefits are maximized while minimizing potential harms. Future directions in AI involve fostering international collaboration, advancing ethical innovation, integrating emerging technologies, and addressing societal inequities. These approaches will pave the way for a sustainable and inclusive AI future.

7.1 Prioritizing Ethical Innovation

Ethical considerations must remain central to AI development. The rapid pace of AI innovation often outstrips the establishment of regulatory frameworks, creating gaps that can lead to misuse or unintended consequences. In the future, developers and policymakers must emphasize "ethics by design," embedding fairness, accountability, and transparency into AI systems from their inception.

One critical area is algorithmic accountability. Future AI systems must include mechanisms for tracing decision-making processes to ensure transparency. For example, explainable AI (XAI) technologies, which provide insights into how AI models reach conclusions, should become the industry standard, particularly in high-stakes domains like healthcare and legal judgments. These systems will not only build trust but also help identify and mitigate biases, ensuring equitable outcomes.

Another priority is the ethical use of data. With AI increasingly reliant on vast datasets, governments and organizations must enforce stringent data protection laws and establish global standards for privacy and security. Emerging technologies, such as federated learning, can allow AI systems to train on decentralized datasets, minimizing the need for centralized data storage and reducing privacy risks.

7.2 Integrating Emerging Technologies

The future of AI is deeply intertwined with other emerging technologies, such as quantum computing, the Internet of Things (IoT), and blockchain. These technologies offer opportunities to enhance AI's capabilities and address existing limitations.

Quantum Computing: The advent of quantum computing has the potential to revolutionize AI by dramatically increasing computational power. Quantum algorithms can optimize complex problems, such as supply chain logistics or drug discovery, that are currently constrained by classical computing methods. As quantum hardware becomes more accessible, it will enable AI systems to process data at unprecedented speeds, unlocking new possibilities in real-time analytics and simulation.

IoT Integration: The Internet of Things (IoT) represents another frontier for AI applications. IoT devices generate vast amounts of real-time data that AI can analyze to improve decision-making. For example, AI-powered IoT systems can enhance urban planning by monitoring traffic patterns, optimizing energy usage, and predicting maintenance needs for critical infrastructure. This integration will be crucial for creating smart cities that are sustainable and efficient.

Blockchain for AI Governance: Blockchain technology offers promising solutions for improving AI governance and security. By creating decentralized and immutable records, blockchain can enhance the traceability of AI systems and ensure accountability. This approach is particularly valuable in sectors like finance, where transparency and fraud prevention are paramount.

7.3 Promoting Global Collaboration

Addressing the challenges of AI requires coordinated global action. The disparities in AI access and development between nations highlight the need for international cooperation to bridge the digital divide. High-income countries must take an active role in supporting low-income nations through technology transfers, capacity-building initiatives, and funding for AI education.

Organizations such as the United Nations and the World Economic Forum should lead efforts to establish global AI governance frameworks. These frameworks must balance innovation with accountability, ensuring that AI technologies are developed and deployed ethically and inclusively. Collaborative research initiatives, such as open AI platforms, can also democratize access to AI tools and knowledge.

Another aspect of collaboration is fostering public-private partnerships. Governments, academia, and the private sector should work together to address complex challenges, such as climate change and healthcare access. For instance, partnerships between tech companies and environmental organizations can leverage AI for conservation efforts, while collaborations with healthcare providers can expand telemedicine solutions in remote areas.

7.4 Investing in Education and Workforce Development

The future of AI hinges on a workforce equipped with the skills needed to harness its potential. Investing in education and training programs is essential to preparing individuals for AI-

driven economies. Governments and institutions must prioritize lifelong learning initiatives that provide opportunities for reskilling and upskilling, particularly for workers in industries disrupted by automation.

AI literacy should become a core component of educational curricula at all levels. Primary and secondary schools can introduce foundational concepts in AI and computer science, while universities and technical institutes offer specialized degrees in machine learning, data science, and robotics. Online platforms and MOOCs (massive open online courses) can play a significant role in democratizing AI education, enabling individuals from diverse backgrounds to participate in the AI workforce.

In addition to technical training, fostering interdisciplinary skills will be critical. As AI intersects with fields like ethics, law, and social sciences, professionals who understand these nuances will be better equipped to navigate the complexities of AI implementation.

7.5 Building Resilience Against AI Risks

As AI becomes more integrated into global systems, resilience against potential risks must be a priority. Governments and organizations should develop contingency plans to address challenges such as cybersecurity threats, algorithmic failures, and economic disruptions caused by automation. Creating robust frameworks for AI auditing and monitoring will be essential to identifying vulnerabilities and mitigating their impact.

Public trust in AI systems is another key consideration. Transparent communication about AI capabilities and limitations can help build confidence among users and stakeholders. Engaging communities in discussions about AI policies and applications will ensure that these technologies align with societal values and priorities.

7.6 Envisioning a Sustainable and Inclusive Future

The ultimate goal of AI innovation should be to create a sustainable and inclusive future. AI has the potential to address some of humanity's most pressing challenges, from eradicating poverty to combating climate change. However, achieving these goals requires a commitment to equitable development and ethical practices.

In sustainability, AI-driven solutions can optimize resource management, monitor environmental changes, and support renewable energy initiatives. For instance, predictive analytics models can forecast weather patterns and optimize crop yields, addressing food security challenges in vulnerable regions. Similarly, AI-powered tools can help industries transition to circular economies, reducing waste and promoting efficiency.

Inclusivity is equally important. AI systems must be designed to benefit all demographics, regardless of socioeconomic status, geography, or cultural background. This includes developing technologies that are accessible to individuals with disabilities and addressing language barriers through AI-powered translation tools. By prioritizing inclusivity, stakeholders can ensure that AI serves as a force for social equity and empowerment.

Conclusion

Artificial Intelligence in 2024 stands at the intersection of extraordinary potential and formidable challenges. Its transformative influence spans industries, societies, and global systems, offering solutions to some of humanity's most complex problems. However, realizing this potential requires a concerted effort to address ethical, technical, and socioeconomic barriers.

The future of AI depends on the collective actions of governments, industries, and communities. By prioritizing ethical innovation, fostering global collaboration, and investing in education, stakeholders can create a framework for responsible AI development. As the technology continues to evolve, a commitment to transparency, accountability, and sustainability will be essential to navigating its complexities.

AI's journey is far from over, but with thoughtful planning and inclusive policies, it can become a powerful tool for shaping a future that benefits all of humanity.

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SÜNİ İNTELLEKT VƏ ALQORİTM

Pənahova İlkanə Mübariz qızı

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Abstract

Humans can update themselves in the context of the development of new communication technologies, but algorithms do this better than themselves. Artificial intelligence can be connected and updated. Artificial intelligence is a problem-solving and inference-making effort aimed at the autonomous application of human intelligence. Artificial intelligence learns, teaches, and makes different inferences about data differently than human intelligence. Artificial intelligence has dominated many fields. They excel in many fields, from visual arts to data analysis, from social networks to graphic analysis. Considering this situation, in today's technologically dependent world, enterprises closely follow technological developments. In this case, keeping a close eye on developments will ensure that their company lives longer. The development of innovative technologies will also play a key role at this stage.

Keywords: Artificial intelligence, digital society, fuzzy logic, automation, innovative technologies

Xülasə

İnsanlar yeni kommunikasiya texnologiyalarının inkişafı kontekstində özlərini yeniləyə bilirlər, lakin alqoritmlər bunu özlərindən daha yaxşı edənlərdir. Süni intellekt bir-birinə bağlana və yenilənə bilər. Süni intellekt, insan intellektinin avtonom tətbiqinə yönəlmiş problem həll etmə və nəticə çıxarma səyləridir. Süni intellekt insan intellektindən fərqli şəkildə öyrənir, öyrədir və məlumatlar haqqında müxtəlif nəticələr çıxarır. Süni intellekt bir çox sahələrə hakim olmuşdur. Onlar vizual sənətdən məlumat təhlilinə, sosial şəbəkələrdən qrafik analizə qədər bir çox sahələrə üstünlük verirlər. Bu vəziyyəti nəzərə alaraq, texnoloji asılılığın artdığı müasir dünyada müəssisələr texnoloji inkişafı yaxından izləyirlər. Bu vəziyyətdə, inkişafı yaxından izləmək şirkətlərinin daha uzun ömür sürməsinə təmin edəcəkdir. Bu mərhələdə innovasiya texnologiyalarının inkişafı da əsas rol oynayacaq.

Açar sözlər: Süni intellekt, rəqəmsal cəmiyyət, qeyri-salis məntiq, avtomatlaşdırma, innovativ Texnologiyalar

Bioloji və texnoloji inkişaf sayəsində bədənlərlə yanaşı ağıllar da formalaşmağa başlayıb. İnsanlar indi hər şeyi idarə etdiklərini düşünsələr də, idarə edə bilməyəcəkləri ən mühüm elementin texnologiya olduğu müşahidə edilir. Süni intellekt sayəsində fiziki və zehni sahələr dəyişib. Bu dəyişikliklə insanların duyğularından başqa işlərinə alternativlər təqdim edəcək robotlar ətraflarına hakim oldu. Bu mərhələdə süni intellektin tətbiqi ilə süni intellektin intuisiyadan belə üstün ola biləcəyi ilə bağlı proqnozlar üstünlük təşkil edib. Digər tərəfdən, alqoritmlər sayəsində insanlar intuisiyalarına deyil, maşınlar məğlub olurlar. Burada vacib olan məqam odur ki, beyin bir neçə fundamental cəhətdən kompüterdən fərqlənir.

1945-ci ildə Eniacın ilk kompüter olaraq qəbul edilməsi ilə süni intellektin insan zəkasını təqlid edərək inkişaf etdirilə biləcəyi fikri ortaya çıxmağa başladı. Alan Turing "Kompüterlər və Kəşfiyyat" (1950) əsəri ilə maşınların düşünə bilib-bilməyəcəyi sualına cavab axtarırdı.

"General süni intellekt texnologiyalarını ənənəvi maşın və dərin öyrənmə texnologiyalarından fərqləndirən odur ki, onlar alqoritmik proqnozlara əsaslanan nəticələrdən kənarda unikal məzmun yaradırlar. Bu sistemlər mürəkkəb dil strukturlarını və mətnlər arasındakı əlaqələri öyrənmək üçün böyük həcmdə məlumatları emal edə və öyrənə bilən laylı süni neyron şəbəkələrindən istifadə edən dərin öyrənmə texnikalarına əsaslanır. Süni neyron şəbəkələri insan beyninin məlumatı emal

etməsinə təqlid edən riyazi modellərdir. Beləliklə, bu şəbəkələr məlumatlardan öyrənərək və əks əlaqə mexanizmləri ilə davamlı olaraq təkmilləşərək dilin struktur xüsusiyyətlərini və semantik əlaqələrini mənimsəyə bilir” (Holmes et al., 2022).

İnsan zəkasını müqayisə edən, bərabərləşdirən və hətta rəqabət aparan araşdırmalar və araşdırmalar uzun müddətdir ki, aparılır. Son zamanlar süni intellekt proqramlarından ən populyarı OpenAI tərəfindən 30 noyabr 2022-ci ildə istifadəyə verilmiş və 5 gün ərzində 1 milyon istifadəçiyə çatan GPT-3.5.5 dil modeli süni intellekt chatbot ChatGPT-dir (Huss, 2023). Süni intellekt hər gün daha da populyarlaşır və həyatımıza sürətlə daxil olan tətbiqlərdən biri olan ChatGPT-nin mənbəyidir. ChatGPT, istifadəçilərinin sorğularına insan kimi cavab verən dərin öyrənmə alqoritmindən istifadə edən bir chatbotdur (Gilson et al., 2022).

İnsana xas bacarıqların və ya iş proseslərinin süni intellekt texnologiyaları ilə həyata keçirilməsi uzun müddət iş tələb edirdi. Süni intellekt sahəsində; dialoqa əsaslanan mətn istehsalı üçün, LaMDA (Google) və Galactica (Meta); görüntü istehsalı üçün DALL-E (OpenAI) və Imagen (Google) kimi süni intellekt proqramları ön plana çıxdı. İnsanların hazırladığı məzmunu ayırd edilə bilməyən mətnlər hazırlamaq üçün nəzərdə tutulmuş ChatGPT adlı söhbət robotunun adı:

Bu Generative Pretrained Transformer (GPT) dil modelinin ən son versiyasını (3.5-ci nəsil) özündə birləşdirən dil modelidir. GPT mənbə girişindən başlayaraq sözlər, kodlar və ya digər məlumat ardıcılığı yaratmaq üçün nəzərdə tutulmuş hesablama sistemidir (Floridi və Chiriatti, 2020, səh. 684). Veb texnologiyalarında inkişaf: Web 1.0 ilə başlayan prosesdən Web 4.0-a qədər bir çox sektora və gündəlik həyata süni intellektin daxil edilməsi, sosial platformalarda maşın öyrənməsi, süni intellekt və inkişaf kimi dərin öyrənmə, məlumatların miqdarını artırdı.

Bazar araşdırması və təhlili, hesabatların yaradılması, uyğun texnologiyanın seçilməsində və istifadəçini anlamaqda mühüm yardım olacağı gözlənilir. 14 mart 2023-cü il tarixli ən son versiyası olan GPT-4, istənilən mətndən maşın öyrənməsini aşağı qiymətə və say göstərmədən öyrənir və bununla da bir çox tapşırıqları yerinə yetirir. O, həmçinin povestlər yarada, kod yaza, şəkilləri avtomatik tamamlaya, tərcümə edə, hesablaya və s. funksiyalar (Grossman, 2020) GPT-4-ü süni intellektin ən təkmil versiyasına çevirdi (Technologyreview.com, 2020). Yeni versiyanın ümumi istifadəçilərə, akademik dairələrə və peşəkar iş dünyasına əvvəlki versiya ilə müqayisədə bir çox sahələrdə daha yüksək performans səviyyəsi təqdim edəcəyi gözlənilir.

Süni intellekt yazır, müxtəlif məqsədlərə xidmət edən alqoritmlər hazırlayır və onların icrasına nəzarət edən fəaliyyətləri həyata keçirir. Süni intellektlə yaradılmış alqoritmlər özlərini optimallaşdırır, yeniləyir və inkişaf etdirə bilər. Belə ki, o, öz hədudlarından kənarda verilənlərə çata, onları araşdırıb, manipulyasiya edərək təhlil edə bilmiş, nəticəsinə uyğun olaraq alqoritm səmərəliliyini artırmışdır. Süni intellektin istifadə sahələrindən biri olan maliyyə sahələrində riskin erkən aşkarlanması, risk üçün simulyasiyalar, risk gözləntilərinin və təxminlərinin hesablanması potensial köməkçi arqumentlər kimi istifadə edilə bilər. Süni alqoritmlər vasitəsilə istifadəçilər üçün fərdiləşdirmə imkanları təqdim edir, beləliklə də sıx əlaqələrə şərait yaradır. İstifadəçinin əvvəlki fəaliyyətlərini və üstünlüklərini nəzərə alan süni intellekt real vaxt məlumatlarından istifadə edərək alqoritmlərdən istifadə edərək onlara fərdiləşdirilmiş mesajlar göndərir (Neti, 2011). İstifadəçi təcrübələrindən əldə edilən məlumatlar ilə gələcək fəaliyyətləri proqnozlaşdırmaq olar. Belə ki, kampaniya proseslərinin planlaşdırılmasında və süni intellekt vasitəsilə müştəri məmnunluğunun təmin edilməsində alqoritmlərdən istifadə edilir.

Rəqəmsallaşdırılmış mediada alqoritmlər süni intellekt vasitəsilə istifadəçilərə asan hesablama, vaxt və əmək qənaəti təmin edib. İnternet şəbəkəsinin birbaşa marketing məqsədləri üçün istifadəsi dəyişən dünyada daha çox sosial vaxt keçirmək üçün e-ticarət saytları vasitəsilə alış-verişin zəruriliyini ortaya çıxarıb. İnternetdən istənilən vaxt və istənilən mühitdə istifadə oluna bildiyi üçün internetdən istifadə edən kommersiya fəaliyyətləri də günü-gündən artmışdır. İnternet sayəsində coğrafi sərhədlər aradan qalxmış, satıcı və alıcıların görüş yeri olan bazar başqa bir ölçü qazanmış,

satıcılar bütün dünyanı istehlakçı kimi qəbul etmiş, ticarət fəaliyyətlərini internet əsaslı sistemlərə keçirmişlər. Bu vəziyyət istehlakçılara keyfiyyət, rahatlıq, rahatlıq, etibar və məmnunluq gətirərək rabitə və informasiya texnologiyaları, məhsulların alınması və satışı, sifarişlərin planlaşdırılması, keyfiyyətli istehsal, rəqabət üstünlüyü və daha çox imkanlar yaratmışdır (Cop və Oyan, 2010:100). Kapitalizmin inkişafı, insanların şüurunda istehlak və istehlak mədəniyyətinin dəyişməsi fərdləri əmtəyə çevirdi. İdeologiya və mədəniyyəti də satın alan istehlakçılar ideoloji spiral dövrədə irəli-geri gedirlər. İstehlak mədəniyyətində bu spiral dövrəni reklamlar vasitəsilə reallaşdırmaq olar. Bu spiral dövrədə reklamlar ümumiyyətlə üç növ marketing problemini həll edə bilər (Kocabaş və Elden, 1996, s. 81):

- Reklamlar məhsulların vəd etdiyi paylama sistemləri haqqında məlumat verir. Bu yolla marketing kompleksində istehlakçıya məlum olmayan obyektlər həll edilə bilər.
 - İstehlakçıya məhsulun necə həll olunacağını çatdırır və problemin həllində istehlakçıya töhfə verir. İstehlakçıya problemin nə olduğu və onun necə həll oluna biləcəyi barədə məlumat verir.
 - Məhsulun düzgün qəbul edilməsinə səbəb olan səbəblərin nə olduğunu istehlakçıya çatdırır.
- Google, milyonlarla axtarışla anında qarşılıqlı əlaqəsi ilə bu gün istifadə edilən ən əhəmiyyətli axtarış motoruna çevrilmişdir. Google həyatımızın vacib bir hissəsinə çevrilsə də, onu vazkeçilməz edən, istifadəçilərə anında rəy bildirməsidir. Hər mövzuda məlumat paylaşan Google, Trendlərə uyğun olaraq istifadəçilərə də fürsətlər təqdim edir. Google bir yol tapa bilmədiyimiz zaman bizə xəritələr təqdim edə bildiyi kimi, insanların genetik xəritələrini də təqdim etmək qabiliyyətinə malikdir. Viseyə görə (2006, s. 19); “O, biolog Dr. Craig Venter və digər genetik mütəxəssislərlə elm, tibb və səhiyyədə mühüm inkişaflara yol açacaq elmi layihələr üzərində işləyir. Başqa sözlə, bir gün insanlar öz genlərində axtarış aparacaqlar”. Google vasitəsilə istehlakçılar axtarıqları məhsulla bağlı saysız-hesabsız alternativlərə baxa, alış-veriş mərkəzinə getdikdə tapa bildiklərindən daha çox alternativ tapa bilərlər. Üstəlik, bunu edərkən Google ən çox tıklanan (tercih edilən) saytları da istehlakçılara təqdim edir. Saytın trafik axınının təmin edilməsi e-ticarət sahibləri üçün vacibdir. Üzvi trafik axınının sürətli olması və ziyarətçilərin bu trafikdə qalması vacibdir. Elektron ticarət saytlarının əsas məntiqi məhsullarını istehlakçılara sata bilməkdir. İstifadəçilərin həmin saytda keçirdikləri vaxt da məhsul satışında əsas amillərdən biridir. İstifadəçilərin səhifəyə olan marağı onların səhifədə keçirdikləri vaxtla düz mütənasib olduğundan e-ticarət saytlarında istehsalçıların istehlakçılarla qarşılıqlı əlaqəsini də artırmaqla.

Açar sözlərin formalaşmasında trendlər vacibdir. Populyar axtarışlar etmək üçün trendlərə uyğun açar sözlər tətbiq etmək lazımdır. Məsələn, Yeni il, Ramazan, Analar Günü kimi özəl anlarda trendləri izləyə və saytın üzvi trafikini artırmaqla.

Robotik kodlaşdırmanın istifadəsi ilə bu kodlaşdırma istehlakçıların nəyi və necə alacağına qərar verməyə başlayıb. Alqoritmlərin istifadəsi məhsulların üstünlüklərini arxa plana keçirərək istehlakçının satın alma seçimlərini tamamilə yönləndirən bir prosesə çevrilmişdir. İnkişaf edən prosesin dinamikası istehlakçı üçün zərərli olduğu qədər də faydalı ola bilər. İstehlakçı axtardığı məhsulu alqoritmlər sayəsində çox tez tapa bilər, lakin məhsulu sorğu-sual etmədən qəbul edən “istehlakçı obyekti” də mənfi hesab edilə bilər. İstehlakçı Google və ya süni intellekt kimi tətbiqlər qarşısında nə edəcəyini və necə edəcəyini qərar verə bilməz. E-ticarət saytları bu tətbiqlər sayəsində tez bir zamanda markaları yadda qalan edə bilər. Google axtarış sisteminin optimallaşdırılması sayəsində istehsalçılar tərəfindən irəli sürülən markalar Google-da daha yüksək yer tutaraq onları istiqamətləndirə bilər. Birinci nişanın həmişə “düzgün” olması məntiqi ilə hərəkət edən istehlakçı məhsulun məzmununu heç vaxt şübhə altına almadan alır.

Gündəlik həyatda asudə vaxt fəaliyyətlərinin artması ilə istehlakçılar vaxtlarının böyük bir hissəsini internetdə keçirirlər. Gündəlik həyatda internet texnologiyasının geniş tətbiqi ilə onlayn rejimdə görüşlər, seminarlar, alış-veriş və s. (Kasap, 2014, səh. 121). Onlayn imkanların inkişafı istehlakçıları onlayn platformalara yönəltdi. İstehlak davranışları cəmiyyətdə hörmət və qəbul qazanmasında mühüm əhəmiyyət kəsb etmişdir. Çünki alış-veriş cəmiyyətdə status qazanmada müəyyən edici amil

olub. Beləliklə demək olar ki, alqoritmlər istehlak hərəkətlərinin istiqamətləndirilməsində müəyyənədiçi hala çevrilmişdir.

Sürətlə dəyişən marketinq fəaliyyətləri nəticəsində e-ticarət saytları günü-gündən geniş yayılmağa davam edir. Davam edən proses e-ticarət saytlarını hərəkətə gətirdi. İstehlakçılarının seçimlərini əvvəlcədən təhlil etmək və istifadəçinin satın alma niyyətlərini müəyyən etmək üçün axtarış sistemlərinə ehtiyac yaranıb. Bu araşdırma marketoloqlar üçün istehlakçılarının seçimlərində hansı dəyişikliklərin baş verdiyini aşkar etmək üçün vacibdir. Sıx informasiya bombardmanı altında alqoritmlərin istehlakçı seçimlərinin müəyyən edilməsində necə rol oynadığı sualının cavabı bu araşdırmada araşdırılmışdır. Tədqiqat Google Trends-in rəqəmsal marketinqə necə təsir etdiyini, marketinqdə ikiliyi və istehlakçılarının reaksiyalarını müəyyən etmək baxımından əhəmiyyətlidir. Bundan əlavə, şüurlu istehlakçının formalaşmasına töhfə verəcəyi və şirkətlərin satış nisbətlərinin real reallıqda necə formalaşdığı da ortaya çıxdı. Araşdırmanın nəticələri araşdırıldığında, demək olar ki, bütün e-ticarət saytlarının öz saytlarını Google axtarış sisteminin optimallaşdırılmasına inteqrasiya etdiyi müəyyən edilmişdir. Xüsusilə açar sözlərdən istifadə etməklə istifadəçilər alqoritmlər sayəsində alışı-verişi etməyə yönəlmiş süni istehlakə təşviq edilir. Alqoritmlər istehlakçını süni intellektlə daha yaxşı təhlil edir və buna görə də müəssisələr texnologiyadan daha çox faydalanır.

Tədqiqatda alqoritmlərin istehlakçı seçimlərində nə qədər əhəmiyyətli olduğu müzakirə edilib. Axtarış motorları sayəsində e-ticarət saytları da daha çox klik əldə etmək və Google reytinglərində birinci olmaq üçün alqoritmlər hazırlayır. İnkişaf etdirilən alqoritmlər sayəsində alqoritmlər yeni kommunikasiya texnologiyalarının təqdim etdiyi imkanlar çərçivəsində istehlakçıları özlərindən daha yaxşı tanıyır. Rəqəmsal marketinq fəaliyyətlərində axtarış sisteminin və istehlakçı seçimlərinin artan əhəmiyyəti, e-ticarət fəaliyyətlərində süni intellekt və alqoritmlərdən istifadə edən müəssisələrə rəqabətdə əhəmiyyətli üstünlüklər verəcək. Bu araşdırma, mövcud inkişafı ədəbiyyata daxil etmək və axtarış sistemləri ilə bağlı gələcək tədqiqatlar üçün mənbə olması baxımından əhəmiyyətlidir. Rəqəmsal marketinqdə mühüm elementlər olan süni intellekt və alqoritm tətbiqlərində axtarış motorları və e-ticarət saytları daha çox klik alaraq Google sıralamalarında birinci sırada yer ala bilər. Alqoritmlər sayəsində istehlakçılar haqqında ətraflı məlumatların əldə edilməsinin marketinq fəaliyyətlərinin effektivliyini artıracağı düşünülür. Rəqəmsal marketinq fəaliyyətlərində axtarış sisteminin və istehlakçı seçimlərinin artan əhəmiyyətinin, e-ticarət fəaliyyətlərində süni intellekt və alqoritmlərdən istifadə edən müəssisələrə rəqabətdə əhəmiyyətli üstünlüklər təmin edəcəyi düşünülür. Bu araşdırma, mövcud inkişafı ədəbiyyata daxil etmək və axtarış sistemləri ilə bağlı gələcək tədqiqatlar üçün mənbə olması baxımından əhəmiyyətlidir. Nəhayət, süni intellekt işinin məntiqi yalnız müvafiq veb saytın yuxarıda olması üçün olmamalıdır; istifadəçilərinin problemlərinə, tələblərinə və ehtiyaclarına yönəlmiş yeni və unikal məzmunun istehsalı şəkildə olmalıdır. Süni intellekt texnikası həddindən artıq istifadə edildikdə, veb saytlar cəzalandırıla bilər. Bununla belə, unutmaq olmaz ki, bütün internet saytları internet istifadəçilərinə xidmət etmək üçün yaradılıb. Gələcək tədqiqatlarda rəqabətdə süni intellekt təcrübələrinin etik aspektlərini araşdırmaq və ədalətli rəqabət şəraitini təmin etmək üçün araşdırma aparıla bilər.

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Перспективное развитие сельхозтехники в Казахстане

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Казахстан обладая огромными территориями, пригодными для сельского хозяйства, постоянно заботится о наличии и готовности сельскохозяйственных машин. Надо отдать должное, правительство, начиная с 2000-х годов пересмотрело отношение к агропромышленному комплексу и, в настоящий момент, приняты новые механизмы субсидирования сельхозтехники. Основное направление – поддержка отечественных предприятий.

На сегодняшний день в республике функционирует 8 крупных заводов и 20 предприятий, которые производят навесное оборудование для сельскохозяйственных машин (рис.1). Стартовала программа льготного лизинга техники местного производства на сумму 120 млрд тенге с годовой ставкой 5%. В следующем году планируется увеличить бюджет программы до 200 млрд. [1]. По данным АО «КазАгроФинанс», на 1 октября 2023 года фермеры приобрели 8796 единиц сельхозтехники, что на 52% больше, чем за аналогичный период прошлого года (5795 единиц).

По данным Союза промышленных инвесторов, годовой объем производства сельскохозяйственной техники в Казахстане составляет 263 млрд тенге [2]. На 2025 год прогнозируется рост до 300 млрд тенге [3].

Ожидается, что производство сельскохозяйственной техники в стране вырастет с 498 млн евро до 568 млн евро к 2025 году. Сообщается, что продажи техники выросли на 52% по сравнению с предыдущим годом. Прогноз позитивный. В Казахстане наблюдается рост экспорта сельскохозяйственных культур, в частности ячменя, чечевицы и кукурузы.

Анализ деятельности АПК РК дает возможность, говорить, что, практически, все отрасли в агропромышленном комплексе Казахстана имеют положительные тенденции своего развития. Аграрная отрасль Республики Казахстан благополучно и динамично преодолевает кризисную ситуацию и наращивает мощности. Обновить парк сельхозтехники планируют за 10 лет в Казахстане. Утвержденная Дорожная карта по реализации инвестиционных проектов продолжает действовать, только в 2023 году было реализовано более двухсот проектов, общей стоимостью 536 млрд тенге.

Агропромышленный комплекс Казахстана имеет поддержку государства. При выработке стимулирующей фискальной политики учитывались множественные проблемы налогообложения. В частности, налогооблагаемая база ориентирована на научное обоснование и учитывает различия в ресурсо-обеспеченности хозяйств. Также важны территориальные и почвенно-климатические особенности. Каждый регион РК имеет свои не только географические и климатические особенности, но и социальные [4].

Министерство сельского хозяйства Республики Казахстан считает, что успех в АПК будет обеспечен за счет принятия таких мер, как:

- субсидии при покупке техники местного производства;
- применение дифференцированного механизма субсидирования, в частности, ставки вознаграждения по кредиту и лизингу на приобретение отечественной сельхозтехники составляет 6%, а для импортной 15%.

В июне 2024 года стартовала программа льготного лизинга техники местного производства на сумму 120 млрд тенге с годовой ставкой 5%. В следующем году планируется увеличить бюджет программы до 200 млрд. Принимаемые меры и поддержка государства дает возможность надеяться на реальную реализацию стратегии Казахстана в области сельского хозяйства. Аграрный сектор становится основным двигателем дальнейшего экономического развития РК.

Износ сельхозтехники в Казахстане составляет около 80%. По данным Министерства сельского хозяйства РК средний возраст более 70% зерноуборочных комбайнов и тракторов составляет 13-18 лет при нормативном сроке эксплуатации 8-10 лет. Кроме того, подлежат списанию более 70% зерноуборочных комбайнов, около 80% тракторов, 75% жаток и 80% сеялок [5].



Рисунок 1 – Карта размещения производства сельхозмашин и комплектующих

Статистическое агентство сообщает, что в настоящий момент среднегодовое обновление техники не составляет более 3%, а энерговооруженность труда работников сельского хозяйства в республике составляет 40 л.с./чел. Чтобы понять эти данные их можно сравнить с показателями в Германии 500 л.с./чел., а в США – 300 л.с./чел.

Исходя из вышеизложенного, можно выделить такие проблемы для сельскохозяйственного машиностроения Казахстана:

- сезонность спроса на продукцию отрасли, а значит неритмичная загрузка предприятий;
- низкий уровень платежеспособности потребителей продукции;
- низкая конкурентоспособность отечественной сельхозтехники на внешних рынках;
- слабая конструкторская база и сложность разработки новых видов сельхозтехники.

Для решения выдвинутых проблем можно рекомендовать более интенсивное использование искусственного интеллекта в производстве сельскохозяйственных машин. Внедрение интеллектуального сельского хозяйства позволит использовать цифровые технологии для более эффективного управления сельским хозяйством. Это максимизация урожайности сельскохозяйственных культур и снижение воздействия на окружающую среду. Искусственный интеллект - это термин, используемый для описания машин, которые

выполняют когнитивные функции, подобные человеческим, такие как обучение, понимание, рассуждения или взаимодействие [8]. Особенно с развитием информационных технологий и широким использованием компьютеров в 20 веке методы искусственного интеллекта в сельском хозяйстве получили быстрое развитие. Сегодня "умные фермы", где используются методы точного земледелия, собирают данные с производственных площадей с помощью дронов или роботов, оценивают их с помощью "умных" методов ведения сельского хозяйства и контролируют все затраты.

Применение искусственного интеллекта в сельском хозяйстве позволит автоматизировать процессы, снизить риски и предоставить предприятиям быстрые, точные и простые предложения.

Интеллектуальное сельское хозяйство, с одной стороны, оптимизирует рабочую силу, используемую в производстве. С другой стороны, оно обеспечивает управление бизнесом с использованием информационных и коммуникационных технологий и повышает урожайность и качество продукции.

В качестве примера можно говорить о компании Cognitive Pilot, которая сообщила о своих планах на развитие производства техники с искусственным интеллектом для нужд АПК. В 2024 году в Томске компания открыла два новых производства вычислительных блоков и видеокамер, которые необходимы для создания техники с ИИ, к примеру, дронов, использование которых в сельском хозяйстве растёт с каждым годом.

Cognitive Agro Pilot — это автопилот для уборочной сельхозтехники на базе искусственного интеллекта, разработанный в России. Система анализирует изображение с камеры как человек, «видит» и «понимает» обстановку по ходу движения комбайна, создает и передаёт команды для выполнения манёвров. Автопилот работает в сложных условиях, подходит ко всем маркам комбайнов, работает по кромке и рядами, может убирать полёгшую культуру. Это новое поколение технологий уборки.

Глобальное влияние ИИ на сельское хозяйство неоспоримо. Он изменил методы ведения сельского хозяйства, обеспечив более надёжное и устойчивое снабжение продовольствием. По мере того как интеграция ИИ продолжает расширяться, будущее сельского хозяйства выглядит многообещающим в плане обеспечения глобальной продовольственной безопасности, экономического роста и экологической устойчивости [9].

Благодаря возможностям искусственного интеллекта фермеры могут принимать решения на основе данных, внедрять методы точного земледелия и автоматизировать трудоёмкие задачи. Использование прогнозной аналитики позволяет принимать упреждающие меры в ответ на изменения погоды, нашествия вредителей и болезни растений. Автоматизированное оборудование и дроны оптимизируют работу, снижая зависимость от человеческого труда. Эти достижения способствуют повышению эффективности, производительности и устойчивости сельскохозяйственной отрасли.

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SÜNİ İNTELEKT VƏ TƏHSİL DATALARININ TƏHLİLİ

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Abstract

Artificial intelligence technologies attract more attention day by day with the contribution of successful projects and research on this subject is getting more and more important. Artificial intelligence technologies, which are used successfully in many sectors, have started to be used in the education sector. In this paper, instructive information has been shared on the subject in order to better understand the studies on the effects of artificial intelligence in education and artificial intelligence technology in the education sector in Turkey and the world has been shown the examples of use. In addition, the contribution of these technologies to the education sector has been investigated. The study was carried out with the literature review method. It is thought that the research can be a resource for future studies on artificial intelligence in education, which is gaining importance.

Keywords: Education, Artificial intelligence in education, Artificial intelligence

Xülasə

Süni intellekt texnologiyaları uğurlu layihələrin qatqısı ilə gündən-günə daha çox diqqəti cəlb edir və bu mövzuda araşdırmalar getdikcə daha çox əhəmiyyət kəsb edir. Bir çox sektorlarda uğurla istifadə edilən süni intellekt texnologiyaları təhsil sektorunda da istifadə olunmağa başlayıb. Bu yazıda süni zəkanın təhsilə təsirləri ilə bağlı araşdırmaların daha yaxşı başa düşülməsi üçün mövzu ilə bağlı ibrətamiz məlumatlar paylaşılıb və Türkiyədə və dünyada təhsil sektorunda süni intellekt texnologiyasından istifadə nümunələri göstərilmişdir. Bundan əlavə, bu texnologiyaların təhsil sektoruna verdiyi töhfələr araşdırılıb. Tədqiqat ədəbiyyat araşdırması metodu ilə aparılmışdır. Tədqiqatın əhəmiyyət qazanan təhsildə süni intellektlə bağlı gələcək tədqiqatlar üçün mənbə ola biləcəyi düşünülür.

Açar sözlər: Təhsil, Təhsildə süni intellekt, Süni intellekt

Fərqində olmasaq da, süni intellekt texnologiyaları gündəlik həyatımızın ayrılmaz hissəsidir. Bu texnologiyalar müxtəlif cihazlar və proqramlar vasitəsilə hər platformada xidmət göstərir. Ağıllı məişət texnikası, avtonom avtomobillər və ya smartfon tətbiqləri süni intellekt texnologiyalara misaldır. Digər tərəfdən, bu texnologiyaların arxasındakı tətbiqlər və anlayışlar haqqında təsəvvürü olanların çox az olduğunu söyləmək olar. Demək olar ki, bizim həyatımız hər an istifadə etdiyimiz bu texnologiyaların təhsil sektorunda geniş şəkildə tətbiqi əhəmiyyətli irəliləyiş hesab edilir. Ümumilikdə təhsil sistemində nəzər salındıqda, şagird, müəllim, tədris kurikulumu və təhsil sahəsi bu dörd əsas komponent üzərində qurulub. Bu komponentlər arasındakı əlaqələrin keyfiyyəti təhsilin keyfiyyətini artırır.

Bu prosesin ən təsirli şəkildə həyata keçirilməsi üçün kritik dəyişən müəllim olduğu bildirilir. Təhsil sistemindəki ən böyük problemlərdən biri insanların müxtəlif üsullarla və müxtəlif dərəcələrdə təhsil almasıdır. Hər bir şagird müxtəlif səviyyələrdə öyrənir. Müxtəlif istedad və maraqlara malik olsalar da, məktəblərdə vahid təhsilin tətbiqinə çalışırlar.

Bununla belə, bəzi tələbələrin analitik təfəkkür bacarıqları daha üstünlük təşkil edir, digərlərində isə yaradıcılıq, ədəbi və ya kommunikativ bacarıqların daha çox üstünlük təşkil etdiyini söyləmək olar.

Süni intellekt texnologiyaları, hər bir şagirdin öz qabiliyyətinə, tədris materialına, öyrənmə üslubu və təcrübələrinə uyğun olaraq fərdiləşdirmək üçün istifadə edilməsinin hədəfləndiyini bildirir.

Dünyada təhsil sahəsində istifadə edilən süni intellektin tətbiqləri haqqında aktual məlumatlar mövzular və ondan təhsildə istifadənin faydaları vurğulanır. Süni intellekt texnologiyaları, bundan sonrakı dövrdə dünyada və ölkəmizdə istifadəsi artacaq.

Qeyd etmək olar ki, süni intellekt tətbiqləri son zamanlar müəyyən mürəkkəb vəzifələri yerinə yetirmək üçün səhiyyə, nitq texnologiyası, enerji, maliyyə və logistika kimi müxtəlif sahələrdə uğurla istifadə olunur. Süni intellekt tətbiqlərinin ortaya çıxmasından uzun müddət keçməsinə baxmayaraq, bu tətbiqlərin təhsil sahəsinə təsiri məhdud olmuşdur. Bu müddət ərzində süni intellekt sinfə tam təsir göstərə bilməsə belə, aktivliyin təmin edilməsindən danışmaq olar (Karsenti, 2019: 105-106). Son zamanlar məktəb termini şagirdlərin və müəllimlərin tədris və təlim fəaliyyətlərində iştirak etmək üçün fiziki və virtual olaraq bir araya gəldiyi yer kimi müəyyən edilməyə başlanmışdır (Timms, 2016: 703). Burada virtual anlayışının vurğulanmasına diqqət yetirilərsə, süni intellekt tətbiqlərinin təhsilə daxil edilməyə başladığı qənaətinə gəlmək olar.

Süni intellekt tətbiqlərinin təhsilə effektiv şəkildə necə inteqrasiyası məsələsi hələ də müzakirə olunur, bir çox proqnozlar və mülahizələr var. Bu proqnozların və düşüncələrin bəziləri süni intellekt tətbiqlərinin sinfdə yalnız müəllimləri əvəz edə biləcəyi tapşırıqlara yönəlib. Bu məsələ hələ də müzakirə olunsa da, bu gün təhsildə süni intellekt texnologiyalarının tətbiq olunduğu bəzi tətbiqlər var. Bu proqramlar müntəzəm və geniş şəkildə istifadə edilməsə də, tələbələrin axtardıqları məlumatlara effektiv şəkildə çatmasına və öz sürəti ilə öyrənmələrinə şərait yaradır. Süni intellekt tətbiqlərinin tələbələrə öz səviyyələrinə və öyrənmə sürətinə uyğun öyrənmə imkanı verməsi bu tətbiqlərin ən böyük üstünlüyü kimi görülür. Bundan əlavə, demək olar ki, tədris nəticələrindən maksimum səmərəlilik əldə edilir, çünki bəzi tətbiqlər çevik iş saatları təklif edir və tələbələrə motivasiya hiss etdikdə dərs almağa imkan verir (Popenici & Kerr, 2017). Süni intellekt texnologiyalarının global miqyasda bütün tələbələrin öyrənmə qarşılıqlı əlaqəsini və təhsil təcrübələrinin tədrisi və dizaynı üçün mövcud imkanları artırdığı müşahidə olunur (Popenici və Kerr, 2017: 5). Müvafiq olaraq, təhsildə süni intellektin inklüziv, ədalətli, keyfiyyətli təhsili təmin etmək və hər kəs üçün ömür boyu öyrənmə imkanlarını təşviq etmək məqsədi daşdığını bildirmək olar. Fərqli nöqtəyi-nəzərdən, süni intellekt tətbiqləri ilə təhsil idarəçiləri büdcə tərtibi, tələbə müraciətləri və qeydiyyat, kursların idarə edilməsi, satınalma və satılma fəaliyyətləri, xərclərin idarə edilməsi və obyektlər kimi müxtəlif inzibati ehtiyaclarla kömək etmək üçün ağıllı köməkçilərdən istifadə edə bilirlər.

Mövzu ilə bağlı müxtəlif araşdırmalar aparıldığında, süni intellekt tətbiqlərinin təhsil və təhsilə töhfə verə biləcəyi görülür. Ədəbiyyat araşdırması nəticəsində əldə edilən bu töhfələri aşağıdakı kimi sıralamaq olar

(Karsenti, 2019; Karsenti, Bugmann, & Parent, 2019; Karsenti, Bugmann, & Gros, 2017).

• Fərdiləşdirilmiş təhsil imkanları təklif edir. Öyrənməni şagirdin fərdi ehtiyaclarına uyğunlaşdırmaq illərdir pedaqoqlar üçün prioritet məsələ olmuşdur. Süni intellekt hər sinfdə orta hesabla 30 şagirdi idarə etməli olan müəllimlər üçün müvafiq səviyyəli fərqləndirməyə imkan verəcək. Süni intellektə əsaslanan təlim sistemləri müəllimlərə tələbələrinin öyrənmə üslubları, bacarıqları və tərəqqisi haqqında faydalı məlumat verə bilər və tələbələrin fərdi ehtiyaclarına uyğun olaraq tədris metodlarını necə fərdiləşdirmək barədə məsləhətlər verə bilər.

- Araşdırmalar göstərir ki, süni intellektin təsiri ilə akademik müvəffəqiyyət artır.
- Süni intellekt birgə öyrənmə üçün ağıllı dəstək verə bilər.
- Müəllimlərin vaxt itkisinin qarşısını alır. Məsələn, süni intellekt proqramları lazımi materialları hazırlaya və kitabları rəqəmsallaşdırma bilər.

- Davamlı qiymətləndirmə və əks əlaqə təmin edilir. O, öyrənmə prosesi boyunca zamanla geribildirim verməklə tələbələrin çatışmayan məlumatlarını müəyyən etmək və tamamlamaq imkanı verir.

- Müəllimlər vəziyyətə uyğun olaraq dərslərini yenidən təşkil edə bilirlər. Məsələn, dünyada 10 milyondan çox şagirdin istifadə etdiyi Coursera və Udacity proqramları müəllimlərin suala çoxlu şagirdin səhv cavab verdiyini və ya qeyri-kafi öyrənmə təmin etdiyini deyərək dərsləri nəzərdən keçirməsinə səbəb olur.

- Fərdi dərslər müraciətləri distant təhsillə təmin edilə bilər. Mobil texnologiyaların sürətlə genişlənməsi ilə həm tələbələr, həm də müəllimlər üçün distant təhsil imkanları yaranır. Bundan əlavə, dil öyrənmə sistemi olan Duolingo kimi tətbiqlərlə istədiyiniz yerdə, istədiyiniz zaman öyrənmə və mobil cihazda anı qiymətləndirmələr edə bilərsiniz.

- İnformasiya ilə qarşılıqlı əlaqənin yeni üsulları effektiv öyrənməyə imkan verir. Məsələn, Google-un istifadə etdiyi süni intellekt sayəsində axtarışlarımız indi coğrafi yerimizə və əvvəlki axtarışlarımıza görə formalaşır.

- Təhsillə bağlı rəy verilir. Məsələn, UTIFEN proqramı tələbələrə öyrənmə yollarını izləmək üçün fərdi mövzular göndərir. Rəy tək-cə fərdiləşdirilmir, həm də daha sürətli və daha tez-tez olur, avtomatik qiymətləndirməyə imkan verir, dəstək və uyğunlaşdırılmış tövsiyələr təklif edir.

- Süni intellekt tətbiqləri fərdlərin maraq və ehtiyaclarına uyğun müxtəlif kitablar tövsiyə edə bilər.

- Tələbələrin akademik bacarıqlarına və öyrənmə səviyyələrinə uyğun fərdiləşdirilmiş ev tapşırığı.

Məsələn: Onlayn ev tapşırığı köməkçisi olan Alloprof tətbiqi tələbələrə təqdim edir

- Virtual reallik və immersiv mühitlər təmin edir. Yüksək interaktiv, üçölçülü virtual dünyalar tələbələri kurs materialları ilə qarşılıqlı əlaqədə olmağa həvəsləndirir. O, real dünyanın bəzi aspektlərini (məsələn, təhlükəli mühitlər və ya coğrafi və ya tarixən əlçatmaz yer) simulyasiya edən orijinal immersiv təcrübələr (real təcrübədə iştirak edən subyektiv təəssürat) təmin edir və istifadəçinin başqa cür daxil ola bilməyəcəyi Məsələn, Assassin's Creed təhsil oyunu tələbələrə canlı və təfərrüatlı tarixi vəziyyətlərdə yaşadıkları və cəlbədicə tapşırıqları yerinə yetirdikləri üçün keçmiş anı yenidən yaşamağa imkan verir

- Şagirdlərin məktəbi tərk etmə riskini proqnozlaşdırma bilər. Süni intellekt tələbə məlumatlarını toplaya və məktəbi tərk etmək riski olan insanlar haqqında məktəb rəhbərliyini tez xəbərdar edə bilər ki, onlar vəziyyət pisləşmədən müvafiq dəstək ala bilsinlər.

- Daha yaxşı sinif idarəçiliyinə nail olmaq olar. Məsələn, Classcraft süni intellekt tətbiqi ilə onu virtual təcrübə ilə öyrənmək olar. Tədris oyunlaşdırma yolu ilə öyrədildiyi üçün bu proqramla hər kəsin iştirakı təmin edilə bilər.

- Daha effektiv inzibati idarəetməyə nail olmaq olar. Xəbərlər, tələbələrin davamsızlığı və s. informasiya tez və asanlıqla idarə oluna və qiymətləndirmələr aparıla bilər.

- Tələbə məlumatlarının asan toplanması və saxlanması təmin edə bilər. Süni intellekt tətbiqləri vasitəsilə tələbələr haqqında məlumatların toplanması, təhlili və qiymətləndirilməsi ilə məlumatlar saxlanıla bilər.

- Xüsusi ehtiyacı olan tələbələrin təhsilində süni intellektdən istifadə etməklə effektiv tədris həyata keçirilə bilər. Süni intellekt alətləri global sinif otaqlarını hər kəs, o cümlədən müxtəlif dillərdə danışan, görmə və ya eşitmə qüsuru olanlar üçün açıq etməyə kömək edə bilər. Həmçinin xəstəlik səbəbindən məktəbə gedə bilməyən və ya müəyyən bir fənni öyrənməyə ehtiyacı olan tələbələr üçün imkanlar vardır.

Təhsil və təlimin keyfiyyətini kompüterdən asılı olmadan yalnız smart sistemlər və ya daxili sistemlər vasitəsilə artırmaq daha faydalı olacaq (Timms, 2016: 711). Ağıllı sinif otaqlarının yaradılması ilə sensorlar vasitəsilə şagird və müəllimin qarşılıqlı əlaqəsinin anında izlənməsi və tələbələrin dərslə motivasiyasının anında izlənməsi, şübhəsiz ki, uğuru artıracaq.

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Қосалқы станцияны ішкі электрмен жабдықтау үшін жаңартылатын энергияны пайдалану тиімділігін бағалау

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Тақырыптың өзектілігі

Қазіргі таңда жаңартылатын энергия көздерін (ЖЭК) қолдану әлемдік деңгейде үлкен өзектілікке ие болып отыр. Көмір, мұнай, табиғи газ секілді қазба отындардың қоры шектеулі және олардың жануынан шығатын зиянды қалдықтар экологияға үлкен қауіп төндіруде. Осыған орай, энергияның таза және жаңартылатын көздеріне, соның ішінде күн энергиясына көшу қазіргі заманның басты талаптарының бірі болып отыр. ЖЭК-ті пайдалану Қазақстанда да өзекті мәселе, себебі елімізде энергияны тұтыну көлемі артып, экологиялық мәселелер күшейіп келеді.

Энергетикалық қауіпсіздік пен экономикалық тиімділікті арттыру үшін энергетика саласында жаңа, экологиялық таза шешімдерді іздеу маңызды. Соның бірі – электр қуатын тарату және жеткізу жүйесінің маңызды бөлігі саналатын электр станциялары мен қосалқы станцияларды өз қажеттіліктеріне қажет энергиямен жабдықтау үшін күн энергиясын пайдалану. Қосалқы станциялардың қызметі тек энергияны таратып қана қоймай, сонымен қатар энергияны өңдеу, басқару және бақылау жұмыстарын қамтиды. Осы жұмыстарды іске асыру үшін станцияның өз ішкі қажеттіліктері де энергияны қажет етеді. Әдетте, бұл энергия сыртқы электр желілерінен алынатын болса, жаңартылатын энергия көздерін, әсіресе күн энергиясын пайдалану арқылы қосалқы станциялардың осы қажеттіліктерін қанағаттандыруға болады.

Қазақстанның географиялық жағдайы мен климаты күн энергиясын тиімді пайдалануға қолайлы. Көптеген аймақтарда күн сәулесі жылына 2500-ден 3000 сағатқа дейін түседі, бұл күн электр станцияларының тиімді жұмыс істеуіне мүмкіндік береді. Әсіресе, Алматы, Оңтүстік Қазақстан, Маңғыстау және Қызылорда облыстары күн энергиясы үшін өте қолайлы аймақтар болып табылады. Осылайша, күн энергиясын қолдану арқылы қосалқы станцияларды ішкі қажеттіліктерімен қамтамасыз ету арқылы сыртқы электр көздеріне тәуелділікті азайтуға болады.

Бұл бағытта күн энергиясын қолданудың тиімділігін бағалау аса маңызды. Біріншіден, бұл экономикалық тиімділікті арттырып, энергия шығындарын қысқартуға мүмкіндік береді. Күн панельдерін орнату бастапқыда қомақты қаржыны қажет етеді, алайда ұзақ мерзімді перспективада олар өзін ақтайды және қосалқы станцияны электр энергиясымен үзіліссіз қамтамасыз ете алады. Екіншіден, бұл шешім экологиялық тұрғыдан маңызды. Қосалқы станциялардың ішкі қажеттіліктеріне ЖЭК қолдану арқылы атмосфераға зиянды қалдықтардың шығарылуын азайтуға және парниктік газдардан келетін экологиялық зиянды төмендетуге болады. Әрбір 1 кВт·сағ күн энергиясы көмір жағудан алынатын энергияға қарағанда CO₂ шығарындыларын айтарлықтай азайтады.

Қосалқы станциялар үшін ЖЭК қолдану сонымен қатар энергетикалық тәуелсіздікті қамтамасыз етуде тиімді шешімдердің бірі болып саналады. Қазақстанның кейбір алыс

аймақтарында электр желілеріне қол жетімділік төмен, бұл жерлерге энергия жеткізу қымбатқа түседі немесе техникалық қиындықтар туғызады. Осындай жағдайларда күн панельдерін орнату қосалқы станцияларға өздігінен энергия өндіру мүмкіндігін береді, бұл жергілікті инфрақұрылымға жүктемені азайтып, жүйенің сенімділігін арттырады.

Сонымен қатар, ЖЭК қолдану арқылы қосалқы станциялардың қызмет ету мерзімін ұзартуға болады. Себебі, ішкі энергия қажеттіліктерін автономды түрде қанағаттандыру станция жабдықтарының жүктемесін азайтып, оларды артық жұмыс режимінде қолданбауға мүмкіндік береді. Бұл станцияның техникалық қызмет көрсету шығындарын азайтып, ұзақ мерзімді пайдалану тиімділігін арттырады.

Осылайша, қосалқы станцияларды жаңартылатын энергия көздерімен, атап айтқанда, күн энергиясымен ішкі энергия қажеттіліктерін қанағаттандыру үшін жабдықтау бүгінгі күні өте өзекті тақырып болып табылады. Бұл тәсіл тек экономикалық және экологиялық артықшылықтар беріп қана қоймай, сонымен қатар Қазақстанның энергетикалық тәуелсіздігін қамтамасыз етуге, жергілікті аймақтарды тұрақты және үздіксіз энергиямен қамтамасыз етуге көмектеседі.

Зерттеу нысандары

Осы жұмыстағы зерттеу нысандары ретінде Алматы қаласындағы 110/10 кВ "Сайран" төмендеткіш трансформаторлық қосалқы станциясы және цифрлық қосалқы станция ретінде мысалға General Electric компаниясының "Digital Energy Substation Automation" үлгісі алынды.

Есептеулер үшін шартты түрде LONGi Solar LR5-72HPH-540M монокристалды панельдер үлгісі алынды. Бұл панельдер қазіргі кезде кең таралған, тиімділігі шамамен 21.1% құрайды және жоғары сапалы, ұзақ мерзімді пайдалану мерзімімен ерекшеленеді.

LONGi Solar LR5-72HPH-540M панелінің негізгі сипаттамалары:

- Қуаты: 540 Вт
- Тиімділік коэффициенті: 21.1%
- Жылдық деградациясы: алғашқы жылы шамамен 2%, одан кейін жылына 0.55%
- Кепілдік мерзімі: 25 жылға дейін өнімділік кепілдігі

Бұл панельдер Алматының климаттық жағдайларына және энергия қажеттіліктерін қанағаттандыруға тиімді шешім ретінде есептеледі.

1. 110/10 кВ "Сайран" трансформаторлық қосалқы станциясы

"Сайран" қосалқы станциясы Алматы қаласында орналасқан және аймақтың энергиямен жабдықтау инфрақұрылымының маңызды бөлігі болып табылады. Ол өнеркәсіптік және тұрмыстық қажеттіліктерге арналған электр энергиясын тарату және түрлендіру жұмыстарын атқарады. Қосалқы станция 110 кВ кернеуді 10 кВ-қа дейін төмендететін трансформаторлармен жабдықталған, бұл энергияны әр түрлі нысандар мен тұтынушыларға таратуға мүмкіндік береді. "Сайран" дәстүрлі типтегі трансформаторлық қосалқы станция болып табылады және электр тарату жүйелеріне тән стандартты құрылғылармен жұмыс істейді.

"Сайран" қосалқы станциясының негізгі қызметтері:

- жоғары кернеуді тұтынушыларға лайықты деңгейге дейін түрлендіру;
- энергия жүйесінің тұрақты жұмысын қамтамасыз ету және электр қуатын үздіксіз жеткізу;
- артық жүктеме мен қысқа тұйықталулардан қорғауды қамтамасыз ету.

"Сайран" қосалқы станциясы электромеханикалық құрылғылар мен дәстүрлі релейлік қорғаныс жүйелерін қолданатын тарату нысанының классикалық мысалы болып табылады.

Мұндай қосалқы станциялар ішкі қажеттіліктерін жаңартылатын энергия көздерімен (мысалы, күн панельдерімен) қамтамасыз ету арқылы модернизациялауға мүмкіндігі бар.

Бұл қосалқы станцияның энергия шығындарын азайтып, энергетикалық тәуелсіздігін арттыруға жол ашады.

2. Әлемдік деңгейдегі цифрлық қосалқы станция

Зерттеудегі екінші нысан – әлемдік деңгейдегі цифрлық қосалқы станция. Бұл қосалқы станциялар – энергетикалық инфрақұрылымның заманауи буыны және олар автоматтандыру мен цифрлық басқарудың ең жаңа технологиялары негізінде жұмыс істейді. Мұндай цифрлық қосалқы станциялар интеллектуалды электронды құрылғыларды (IED) пайдалану арқылы трансформация және электр қуатын тарату процестерін қашықтықтан бақылау мен басқаруға мүмкіндік береді.

Цифрлық қосалқы станцияның негізгі сипаттамалары:

Цифрлық технологияларды интеграциялау: IEC 61850 секілді байланыс протоколдары арқылы жүйені дәл басқару мен қорғауды қамтамасыз етеді. Деректер нақты уақыт режимінде беріледі және өңделеді, бұл жүйедегі кез келген өзгерістерге жедел жауап беруге мүмкіндік береді.

Жоғары энергия тиімділігі мен сенімділік: Цифрландыру және дәл басқару арқылы цифрлық қосалқы станциялар энергияны тұтыну мен тарату процесін оңтайландырып, шығындарды азайтады.

Автоматтандырылған процестер: Цифрлық қосалқы станциялар минималды адам араласуымен жұмыс істейді, бұл эксплуатациялық шығындарды азайтып, сенімділікті арттырады.

Жетілдірілген қауіпсіздік және қорғау жүйелері: Цифрлық қосалқы станциялар артық жүктемелер, апаттық жағдайлар және басқа да тәуекелдерге жедел әрекет ете алатын қорғау және мониторинг жүйелерімен жабдықталған.

Әлемдік деңгейдегі цифрлық қосалқы станция зерттеу нысаны ретінде үлгілік объект болып табылады. Ол заманауи цифрлық технологияларды қолдану арқылы қосалқы станцияның сенімділігін арттырып, энергия тиімділігін қамтамасыз етуге бағытталған. Сондай-ақ, мұндай цифрлық станция өз ішкі қажеттіліктерін жабу үшін жаңартылатын энергия көздерін оңтайлы пайдаланудың артықшылықтарын көрсетеді.

"Сайран" қосалқы станциясы мен цифрлық қосалқы станцияны салыстырмалы талдау дәстүрлі және заманауи энергиямен жабдықтау әдістерінің артықшылықтары мен кемшіліктерін анықтауға мүмкіндік береді. Бұл зерттеу жаңартылатын энергия көздерін қолдану арқылы қосалқы станциялардың энергия тиімділігін арттырудың және оларды цифрлық деңгейге жеткізудің тиімділігін көрсетуге бағытталған.

Экономикалық тиімділік

Экономикалық тиімділікті бағалау үшін әрбір қосалқы станцияның ішкі қажеттіліктеріне арналған энергияны күн энергиясы арқылы өндіру тиімділігін есептейміз. Бұл есептеулерде күн панельдерінің қажетті қуатын, бастапқы инвестицияны, жылдық үнемді және өтелу мерзімін қарастырамыз.

Негізгі параметрлер мен есептеу шарттары

1. Қосалқы станциялардың ішкі қажеттіліктері:

- "Сайран" қосалқы станциясы: ішкі энергия қажеттілігі шамамен 567 кВт құрайды.
- "Digital Energy Substation Automation" қосалқы станциясы: цифрлық жүйелерді пайдалану арқасында бұл қосалқы станцияның ішкі энергия қажеттілігі төмен және шамамен 450 кВт деп есептейміз.

2. Күн радиациясы:
 - Алматыда орташа күн радиациясы тәулігіне шамамен $4.5 \text{ кВт} \cdot \text{сағ} / \text{м}^2$.
 3. Күн панельдерінің тиімділігі:
 - Жүйенің жалпы тиімділігін 80%-ға тең деп аламыз, бұл шығындарды, инверторлар мен басқа компоненттерді ескереді.
 4. Электр энергиясының құны:
 - Электр энергиясының құнын $0.05 \text{ USD} / \text{кВт} \cdot \text{сағ}$ деп аламыз.
 5. Күн панельдерінің құны:
 - Күн панельдерін орнату құны 1 кВт қуатқа шамамен 1000 USD деп есептейміз.
1. "Сайран" қосалқы станциясы үшін есептеулер
 Күн панельдерінің қажетті қуаты
 Орташа тәуліктік энергия қажеттілігі:

$$E_{\text{тәулік}} = 567 \text{ кВт} \times 24 \text{ сағ} = 13608 \text{ кВт} \cdot \text{сағ}$$

Тәуліктік энергия қажеттілігін $4.5 \text{ кВт} \cdot \text{сағ} / \text{м}^2$ орташа күн радиациясына бөлу арқылы қажетті панель қуатын анықтаймыз:

$$P_{\text{панельдер}} = \frac{13608}{4.5} = 3024 \text{ кВт}$$

Жүйенің тиімділігін ескерсек, қажетті қуат шамамен:

$$P_{\text{қажетті}} = \frac{3024}{0.8} = 3780 \text{ кВт}$$

Инвестициялық шығындар:

$$\text{Шығындар} = 3780 \text{ кВт} \times 1000 \text{ USD} = 3780000 \text{ USD}$$

Жылдық үнем

Жылдық энергия қажеттілігі:

$$E_{\text{жылдық}} = 13,608 \text{ кВт} \cdot \text{сағ} \times 365 = 4,968,920 \text{ кВт} \cdot \text{сағ}$$

Электр энергиясын сатып алудан жылдық үнем:

$$\text{Үнем} = 4968920 \text{ кВт} \cdot \text{сағ} \times 0.05 \text{ USD} = 248446 \text{ USD}$$

Өтелу мерзімі

$$\text{Өтелу мерзімі} = \frac{3780000}{248446} = 15.2 \text{ жыл}$$

"Digital Energy Substation Automation" цифрлық қосалқы станциясы үшін есептеулер

Күн панельдерінің қажетті қуаты

Цифрлық қосалқы станцияның орташа тәуліктік энергия қажеттілігі:

$$E_{\text{тәулік}} = 450 \text{ кВт} \times 24 \text{ сағ} = 10,800 \text{ кВт} \cdot \text{сағ}$$

Қажетті панель қуаты:

$$P_{\text{панельдер}} = \frac{10800}{4,5} = 2400 \text{ кВт}$$

Жүйенің тиімділігін ескерсек, бұл шамамен:

$$P_{\text{қажетті}} = \frac{2400}{0,8} = 3000 \text{ кВт}$$

Инвестициялық шығындар

$$\text{Шығындар} = 3000 \text{ кВт} \times 1000 \text{ USD} = 3000000 \text{ USD}$$

Жылдық үнем

Жылдық энергия қажеттілігі:

$$E_{\text{жылдық}} = 10800 \text{ кВт} \times 365 = 3942000 \text{ кВт} \times \text{сағ}$$

Электр энергиясын сатып алудан жылдық үнем:

$$\text{Үнем} = 3942000 \text{ кВт} \times \text{сағ} \times 0.05 \text{ USD} = 197100 \text{ USD}$$

Өтелу мерзімі

$$\text{Өтелу мерзімі} = \frac{3000000}{197100} = 15,2$$

Қорытынды салыстыру

Көрсеткіш	"Сайран" қосалқы станциясы	"Digital Energy Substation Automation"
Қажетті қуат, кВт	3,780	3,000
Инвестициялық шығындар, USD	3,780,000	3,000,000
Жылдық үнем, USD	248,446	197,100
Өтелу мерзімі, жыл	15.2	15.2

Қорытынды

Осы зерттеуде "Сайран" трансформаторлық қосалқы станциясы және әлемдік деңгейдегі цифрлық қосалқы станция ("Digital Energy Substation Automation" үлгісі) үшін ішкі энергия қажеттіліктерін жаңартылатын энергия көздері, әсіресе күн энергиясы арқылы қанағаттандырудың экономикалық және техникалық тиімділігі қарастырылды. Зерттеу нәтижесінде әрбір станция үшін күн панельдерінің қажетті қуаты, инвестициялық шығындар, жылдық үнем және өтелу мерзімі анықталды.

"Сайран" қосалқы станциясы мен цифрлық қосалқы станцияны салыстыру олардың арасында айтарлықтай айырмашылықтарды көрсетеді. Цифрлық қосалқы станция цифрландыру және тиімді басқару технологияларының арқасында төмендеу энергия тұтынуын талап етеді, бұл күн энергиясын пайдалану тиімділігін арттырып, шығындарды азайтады.

Есептеулер күн панельдерін орнату арқылы екі станцияда да ұзақ мерзімді үнемділікті қамтамасыз етуге болатынын көрсетті. Өтелу мерзімі шамамен 15.2 жылды құрайды, бұл Қазақстан жағдайында күн энергиясын пайдалану экономикалық тұрғыдан мақсатқа сай екенін білдіреді. Сонымен қатар, күн энергиясын қолдану арқылы экологиялық жағынан тиімділік артып, CO₂ шығарындылары едәуір азаяды, бұл тұрақты даму мақсаттарына да сай келеді.

Қорыта айтқанда, күн энергиясын қосалқы станциялардың ішкі қажеттіліктеріне қолдану – экономикалық және экологиялық тұрғыдан тиімді, әрі энергетикалық тәуелсіздікті арттыратын оңтайлы шешім. Болашақта цифрлық технологиялар мен жаңартылатын энергия көздерін үйлестіре отырып, Қазақстанның энергетикалық секторында жоғары тиімді, экологиялық таза және инновациялық инфрақұрылым құруға мүмкіндік бар.

УДК 681.5.574.46

ИССЛЕДОВАНИЕ И РАЗРАБОТКА АВТОМАТИЗИРОВАННОЙ МНОГОСТУПЕНЧАТОЙ СИСТЕМЫ ФИЛЬТРАЦИИ ДЫМОВЫХ ГАЗОВ НА ОБЪЕКТАХ ЭНЕРГЕТИКИ

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Введение. В настоящее время функционирование объектов энергетики для государств и, в частности, для отдельных городов, играет очень существенную роль. Однако, применение разного рода топлива для нагрева теплоносителя на объектах энергетики напрямую влияет на состояние экологической ситуации окружающих территорий. Мировой опыт показывает, что большинство современных ТЭЦ использует природный газ в технологическом процессе нагрева, при таком варианте выбросы вредных веществ минимальны. В Казахстане большинство объектов энергетики используют высокотеплотное угольное топливо, из-за чего создаются весьма серьезные экологические проблемы в крупных городах. Например, в городе Алматы уголь применяют на станциях ТЭЦ-2 и ТЭЦ-3, а на ТЭЦ-1 уголь и мазут являются резервными видами топлива. Также, важно отметить, что задействованные ТЭЦ находятся в сильно изношенном состоянии, в том числе это касается систем газоочистки на данных станциях. В результате использования высокотеплотного угля и применения изношенных систем фильтрации в воздушный бассейн города Алматы выбрасывается множество неочищенных мелкодисперсных частиц РМ-10, РМ-2,5 и токсичных оксидов азота и серы. Текущее положение вещей пытаются исправить за счет газификации объектов энергетики, но, фактически, до конца это не решит сильную проблему экологии, так как газификация в целом для Казахстана несет больше рисков, чем плюсов. В свою очередь, разработка новой многоступенчатой системы газоочистки на объектах энергетики позволило бы не только отказаться от дорогостоящей газификации, но и позволит безопасно для экологии города применять угольное топливо для функционирования объектов ТЭЦ.

Целью настоящей работы является разработка автоматизированной многоступенчатой системы фильтрации на объектах энергетики.

Анализ экологической проблемы города Алматы. Алматы из трех ТЭЦ только ТЭЦ-1 перешла на природный газ, хотя уголь и мазут остаются резервным топливом. «На сегодняшний день основным топливом ТЭЦ-1 является природный газ, который поступает по двум газопроводам среднего давления...» [1]. Перевод остальных ТЭЦ на газ планируется на 2025-2026 гг., однако, учитывая постоянные задержки, этот процесс может снова затянуться на более долгие сроки. С 2023 года на территории ТЭЦ-2 строится новая газовая

станция, где газ сжигается в замкнутом технологическом цикле, что исключает выбросы в атмосферу. «Алматинскую ТЭЦ-2 планировали перевести на газ в течение многих лет прежде, чем решили в итоге строить газовые турбины рядом с ней» [2]. При этом закрытие старых объектов энергетики невозможно из-за дефицита электроэнергии, который к 2030 году может достичь 2,4 млрд кВтч. В 2023 году из 106 млрд кВтч, произведенных в Казахстане, 80% обеспечили ТЭЦ, 75% из которых за счет угля (63,6 млрд кВтч), около 25% электроэнергии было произведено с использованием природного газа (21,2 млрд кВтч) (рисунок 1) [3].



Рисунок 1 – Выработка электроэнергии разными видами топлива

Угльное топливо остается доминирующим, а происходит это в силу его простоты использования, большой теплоемкости, огромных запасов и распространенности соответствующего энергетического оборудования на большинстве ТЭЦ, которое поддерживает именно угльное топливо, а не природный газ. Экологическая проблема ТЭЦ также прослеживается из регулярных штрафов предельно допустимых выбросов (ПДВ). Но официальная позиция заключается в том, что основным источником загрязнений является автотранспорт города и его избыточное количество. «Последнее [исследование 2018 года] было проведено в прошлом году по заказу самого акимата и доказало: никакие пробки не отравляют воздух так, как это делают три Алматинские ТЭЦ» [4].

Также в результате исследования было установлено, что выбросы вредных веществ, которые не были очищены, в 2006 году составили около 4,85 тыс. тонн, а в 2018 году – уже 10,4 тыс. тонн. Данный показатель выбросов продолжает увеличиваться.

Разновидности ископаемого топлива и его применение на объектах энергетики. В Казахстане используются разные виды угля для разных целей, но все они характеризуются основным показателем качества – степенью зольности угля. При этом зольность напрямую влияет на выбросы взвешенных частиц в атмосферу. В несгоревшей фракции всегда присутствуют тяжелые частицы (как правило, всегда оседают), средние частицы (могут улетучиваться, но со временем оседают) и мелкие частицы (практически всегда улетучиваются и могут не оседать годами) [5].

На рисунке 2, представлена диаграмма сравнения степени зольности разного вида угля, который используется в Казахстане.

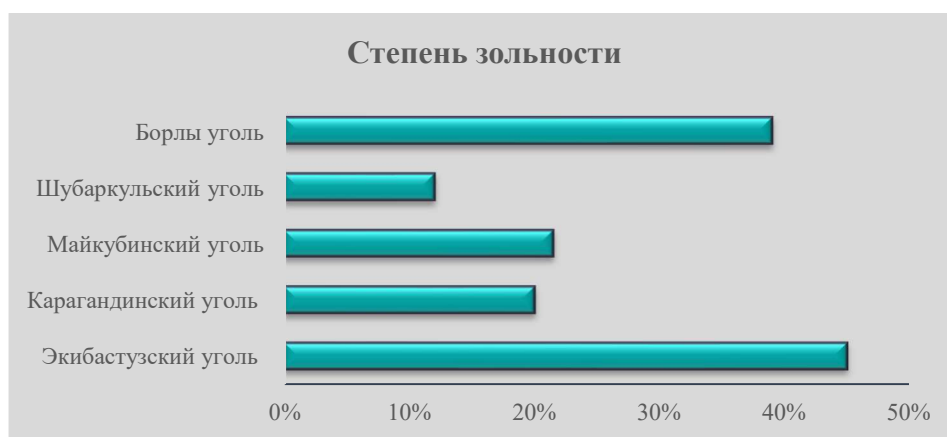


Рисунок 1.2 – Сравнение степени зольности разного вида угля

В качестве основного топлива для ТЭЦ-2, ТЭЦ-3 и частично для частного сектора является уголь Экибастузского месторождения, который поставляется предприятием «Богатырь Комир» [6]. Как следует из рисунка 2 именно этот вид угля обладает наибольшей степенью зольности (около 45% и выше).

Также в ходе выполненного обзора по возможности обогащения данного вида угля было установлено, что Экибастузский высокозольный уголь относится к очень труднообогатимым материалам (IV категория), а значит данный процесс будет очень затратным и малоэффективным [7].

Исследование проблемы газификации объектов энергетики. В настоящее время существует распространенное мнение о том, что перевод объектов энергетики полностью на газ может поспособствовать решению проблем экологии города. Конечно, использование газа в качестве основного топлива действительно повлияет на конечные выбросы, сделав их более экологичными, но выделяют следующие проблемы.

Во-первых, в Казахстане большая часть газа экспортируется в другие страны, что существенно поддерживает экономику страны, однако, излишек газа для ТЭЦ нет, поэтому будет использоваться импортный газ России и других стран. Это, в свою очередь, приведет к повышению тарифов на газ [8].

Во-вторых, газификация требует значительных затрат средств: ожидается, что переход ТЭЦ-2 на газ обойдется в 327 млрд. тенге, по заявлениям управляющих компаний, таких средств в бюджете нет, поэтому на модернизацию уже берутся кредиты, соответственно займы будут оплачиваться через тарифы алматинцев [8].

В-третьих, согласно расчетам предварительного технико-экономического обоснования, перевод Алматинской ТЭЦ-2 на газ не представляется возможным из-за повышенной взрывоопасности, вследствие активной сейсмической зоны. Это происходит из-за того, что конструкция станции уходит на глубине 12 метров, там и располагается оборудование и котлы. В случае, если оборудование будет газифицировано, то любое сильное землетрясение будет способно вызвать утечку газа, а что будет очень опасно.

В-четвертых, в результате газификации объектов энергетики, согласно прогнозам, качество воздуха будет улучшено на 10,5%. На фоне колоссальных затрат и повышенных тарифах такой эффект будет малозаметен, а целесообразность всего проекта будет активно подвергаться сомнениям.

В связи с этим наиболее перспективным вариантом будет разработка и внедрение сравнительно нового технологического процесса очистки дымовых газов.

Исследование методов газоочистки на объектах энергетики. В ходе выполненного обзора методов газоочистки определены наиболее перспективные методы для реалий Алматинских ТЭЦ. Также было установлено, что на Алматинской ТЭЦ-2, на данный момент,

применяется двухступенчатая система очистки, состоящая из труб Вентури и скрубберов. Ранее на станции использовались электрофилтры, но из-за технических неисправностей и недостатка финансирования на ремонтные работы, фильтры были демонтированы. Таким образом, по установленной информации, только скрубберы Вентури используются для очистки дымовых газов, однако, этого недостаточно, чтобы полностью нейтрализовать выбросы. Неэффективность очистки также подтверждается тем, что из дымовых труб Алматинской ТЭЦ выходит достаточно едкий черный дым, который явно не прошел полный цикл фильтрации.

В результате, в работе предложена четырехступенчатая система фильтрации дымовых газов.

Первая ступень газоочистки использует систему скрубберов Вентури, которые предназначены для первичного удаления взвешенных частиц и уменьшения общей температуры газового потока. Данная ступень неспособна полностью удалить все взвеси, а лишь их некоторую часть, но более важно то, что существенно снижается общая температура газа. Это необходимо для следующей ступени газоочистки.

Ускорение газа, которое происходит за счет трубы Вентури и создаваемой области низкого давления, описывается следующим образом:

$$P_1 + \frac{\rho_{\text{газ}} \cdot v_1^2}{2} = P_2 + \frac{\rho_{\text{газ}} \cdot v_2^2}{2}, \quad (1)$$

где P_1 и P_2 – давление газа на входе и в горловине трубы Вентури, Па;

v_1 и v_2 – скорость газа на входе и в горловине трубы Вентури, $\frac{\text{м}}{\text{с}}$;

$\rho_{\text{газ}}$ – плотность дымовых газов, $\frac{\text{кг}}{\text{м}^3}$.

В скруббере происходит теплообмен между потоком горячего газа и холодной распыляемой водой. Уравнение теплового баланса можно описать следующим образом:

$$Q_{\text{передан.}} = m_{\text{расх.}} \cdot c_{\text{тепл.}} \cdot (T_{\text{вход}} - T_{\text{выход}}), \quad (2)$$

где $Q_{\text{передан.}}$ – количество тепла, переданное от газа жидкости, $\frac{\text{Дж}}{\text{с}}$;

$m_{\text{расх.}}$ – массовый расход газа $\frac{\text{кг}}{\text{с}}$;

$c_{\text{тепл.}}$ – удельная теплоемкость газа $\frac{\text{Дж}}{\text{кг} \cdot \text{К}}$;

$T_{\text{вход}}, T_{\text{выход}}$ – температуры газа на входе и выходе из скруббера, К.

Таким образом, можно будет определить выходную температуру газового потока после прохождения скруббера.

Математическая модель улавливания частиц выглядит следующим образом:

$$\eta = 1 - e^{-\frac{K \cdot A}{Q}}, \quad (3)$$

где η – эффективность удаления взвесей, %;

K – коэффициент массопереноса, $\frac{\text{м}}{\text{с}}$;

A – площадь контакта газа и распыляемой жидкости, м^2 ;

Q – объемный расход газа, $\frac{\text{м}^3}{\text{с}}$.

Вторая ступень фильтрации задействует электрофилтр. Благодаря существенному понижению температуры газа удельное электрическое сопротивление взвесей также падает, что в разы увеличивает показатель золоулавливания в электрофилтре. Данная

ступень практически полностью удаляет все взвешенные частицы из потока газа, остаются лишь сверхмалые частицы, которые электрофильтр уловить уже неспособен.

Подобная система из двух ступеней фильтрации применяется на Экибастузской ГРЭС [9]. Благодаря такому варианту системы, было установлено, что при влагосодержании газа на уровне $8 \frac{\text{г}}{\text{м}^3}$ электросопротивление взвесей снижается в 7 раз.

Зависимость удельного электрического сопротивления от температуры газа и зависимость для скорости дрейфа частиц приведены на рисунке 3 [10].

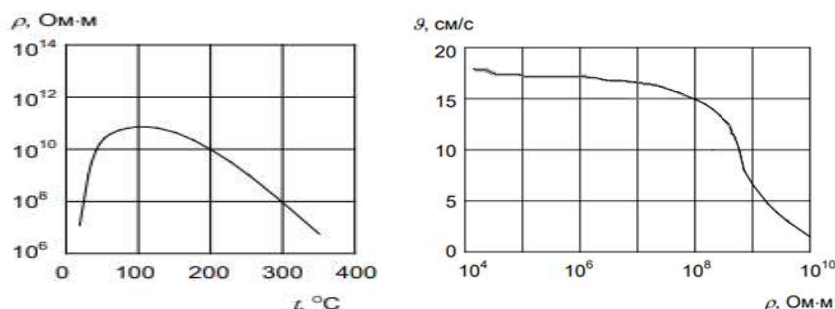


Рисунок 3 – Зависимость удельного электрического сопротивления газа от его температуры

Таким образом, существует два варианта решения проблемы высокого сопротивления газа. Первым вариантом является снижение температуры газа, например, за счет скруббера Вентури, как это было описано выше, а вторым вариантом является значительный нагрев газа, что само по себе затратно и сложно.

Математическая модель эффективности золоулавливания электрофильтра имеет следующий вид [10]:

$$\eta = 1 - e^{-\frac{A_{\text{осад.}} \cdot \vartheta_{\text{дрейфа}}}{v}}, \quad (4)$$

где $A_{\text{осад.}}$ – площадь поверхности осаждения, м^2 ;

$\vartheta_{\text{дрейфа}}$ – скорость дрейфа взвешенных частиц, $\frac{\text{м}}{\text{с}}$.

v – общая скорость газа, $\frac{\text{м}}{\text{с}}$.

Одним из важнейших параметров для эффективного золоулавливания в электрофильтре является напряженность электрического поля E , данный показатель напрямую влияет на скорость дрейфа частиц в активной зоне электрофильтра, соответственно, и на эффективность золоулавливания. Часто верхним значением напряженности электрофильтра является примерно $15 \frac{\text{кВ}}{\text{см}}$. Более высокие значения напряженности могут вызвать искровой пробой, что является нежелательным фактором для оборудования электрофильтра. Считается, что чем ближе напряженность к максимально допустимому значению, то тем лучше проходит золоулавливание. Однако, постоянное поддержание максимального значения напряженности вызывает значительные затраты на электроэнергию.

Также, если свойства газа не требуют развития максимальной напряженности электрического поля, то достаточно, например, половины мощности. Таким образом, можно оптимизировать работу электрофильтра. Но, поскольку, существуют такие входные параметры, которые достаточно сложно предсказать математически, то имеются основания для разработки нечеткой системы регулирования напряженности электрофильтра.

Таковыми факторами являются температура газа (после прохождения скруббера Вентури достаточно сложно предсказать итоговую температура газа), запыленность газа (аналогично, после прохождения скрубберной очистки содержание взвешенных частиц в

газе уменьшится, но сложно предсказать насколько именно) и скорость газа (параметр также может вариативно меняться). В результате имеются три входных параметра для нечеткой системы и один выходной параметр – напряженность электрического поля. Общий вид системы представлен на рисунке 4.



Рисунок 4 – Вид нечеткой системы

Из рисунка 4 следует, что изначально в реальном времени измеряются температура, запылённость и скорость газа (происходит это с помощью термопары, оптического сенсора и датчика скорости соответственно).

Разработанный блок нечеткой адаптации (нечеткой системы) и результирующая поверхность представлен на рисунке 5.

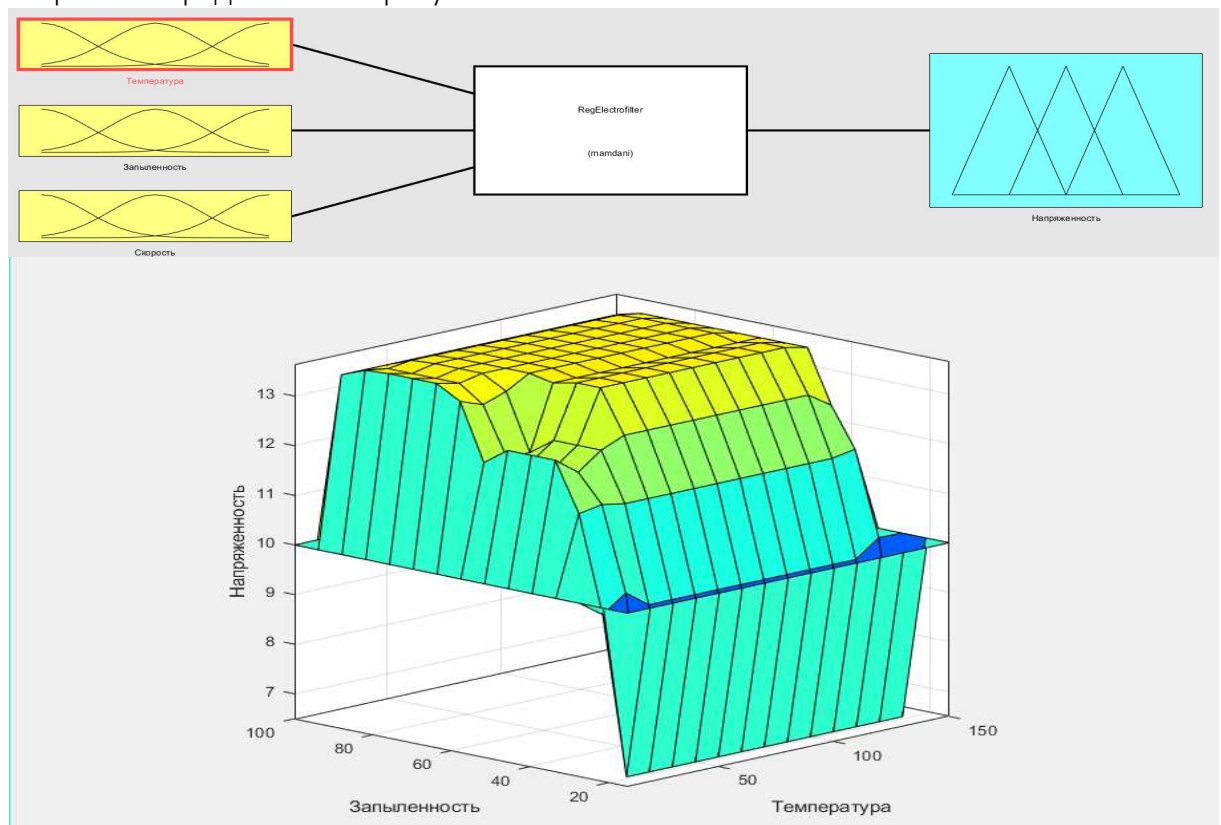


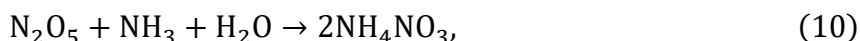
Рисунок 5 – Структура нечеткой системы и результирующая поверхность

Таким образом, нечеткая система определяет значение напряженности на основании входных данных температуры, запыленности и скорости газа. Распределение значений показывается на трехмерной поверхности выше. В будущем планируется доказать устойчивость системы вместе с нечетким регулятором.

Третья ступень газоочистки использует озонно-аммиачную очистку, которая делится на два этапа. Изначально в поток газа вводится озон (O_3), что позволяет окислять токсичные слабореакционные оксиды азота и серы до высших оксидов:



В свою очередь, полученные вещества хорошо реагируют с водой с добавлением аммиака, в результате, образуются твердые соли, которые осаждаются вниз, а очищенный газ идет дальше:



Достоинство метода заключается в его скорости реакций и эффективности. Общий вид такой схемы показан на рисунке 6 [9].

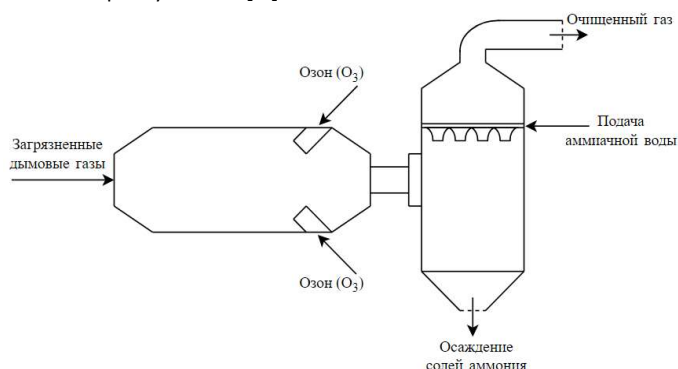


Рисунок 6 – Вид системы озонно-аммиачной очистки

Заключительным четвертым этапом газоочистки является применение тканевого (рукавного) фильтра. Фильтр обладает достаточно тонким фильтрующим материалом, что позволяет задерживать мельчайшие частицы, которые остались в потоке газа, или попали туда в ходе прохождения по технологическому процессу.

Также известно то, что наиболее мелкие взвешенные частицы, как правило, не улавливаются электрофильтром, в связи с этим применение тканевого фильтра является обязательным заключительным этапом. Математическая модель фильтрации, следующая:

$$\eta = 1 - e^{-\frac{K_f \cdot A}{Q}}, \quad (12)$$

где η – эффективность улавливания взвесей;

K_f – коэффициент фильтрации;

A – площадь фильтрации;

Q – объемный расход газа через фильтр.

Таким образом, ожидается, что разработанная система позволит существенно сократить количество выбросов и улучшить экологическую ситуацию, тем самым не будет

необходимости во внедрении дорогостоящей и рискованной газификации объектов энергетики.

Разработка автоматизированной многоступенчатой системы газоочистки. В дальнейшей перспективе планируется выполнить разработку автоматизированной системы управления технологическим процессом газоочистки в качестве распределенной системы управления. Вид такой системы представлен на рисунке 7.

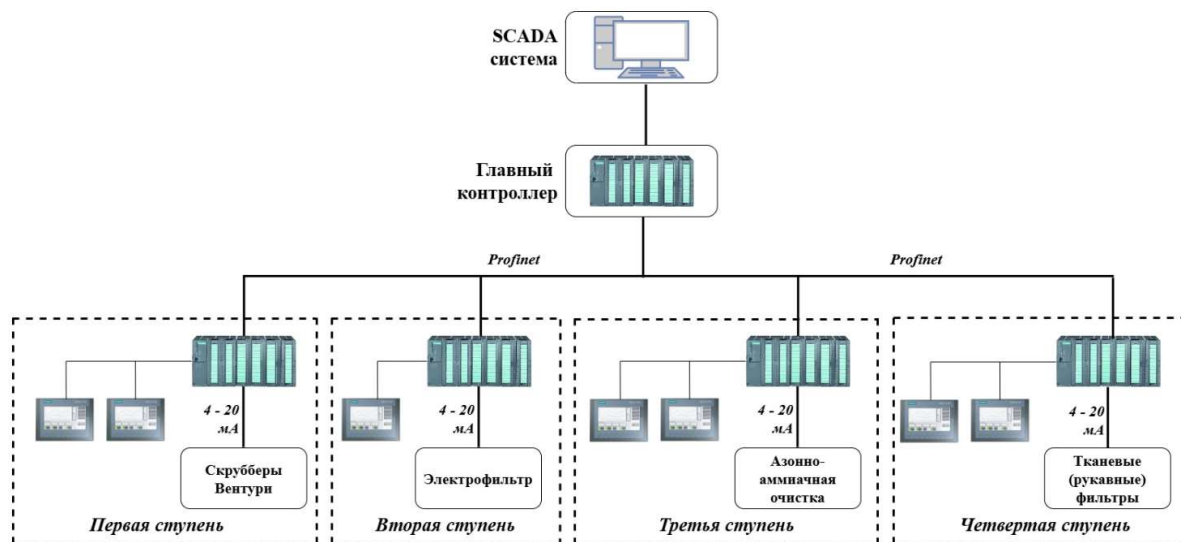


Рисунок 7 – Структура автоматизированной системы

Исходя из структуры, за каждым этапом газоочистки будет закреплен свой автономный программируемый логический контроллер (ПЛК), что, в свою очередь, дает возможность фокусировать вычислительные ресурсы контроллера только на соответствующем этапе технологического процесса. Такой подход позволяет снизить нагрузку на ПЛК, улучшить производительность в целом, также крайне важно то, что, если какая-либо из автономных контроллеров откажет, или необходимо будет остановить определенный этап технологического процесса, то это не приведет к полной остановке технологического процесса благодаря распределенности управления. Для каждого контроллера предусматривается резервирование, что существенно повысит отказоустойчивость системы.

Для осуществления местного управления оператором и снятию текущих значений ключевых параметров каждого этапа фильтрации, предусматриваются HMI-интерфейсы (Human Machine Interface).

Распределенные контроллеры связаны с датчиками с помощью токовой петли 4-20 мА (Current Loop), связь между контроллерами и главным обрабатывающим контроллером налаживается с помощью промышленного протокола Siemens PROFINET.

Главный контроллер отвечает за сбор данных, а также производит управление системой в аварийном режиме, отслеживает соблюдение заданных технологических уставок. Собранные данные отправляются главным контроллерам в SCADA-систему (Supervisory Control And Data Acquisition), где происходит сохранение данных, визуализация всего технологического процесса, происходит построение исторических трендов и реализуется диспетчерское управление.

Программирование контроллеров планируется осуществить в программном обеспечении TIA Portal V15, а разработку SCADA-системы – на WinCC 7.5.

Закключение. Выявлена главная экологическая проблема города Алматы, которая заключается в значительном загрязнении воздушного бассейна из-за сильно изношенных угольных объектов энергетики города.

Установлено, что большая часть электроэнергии 75% (84,6 млрд квтч) была произведена именно с помощью угольного топлива, а с помощью природного газа только 25% (21,2 млрд квтч), что доказывает доминацию угольного сырья в энергетике Казахстана.

Установлено, что основным энергетическим ресурсом сырьем Казахстана является Экибастузский уголь, в ходе сравнительного анализа с другими видами угля оказалось, что именно данный тип угля имеет самую высокую зольность (около 45%). Таким образом, предварительное обогащение такого угля будет очень затратным и неэффективным.

В ходе исследование проблемы газификации объектов энергетики города Алматы определены основные факторы и риски, которые делают данное мероприятие очень затратным и опасным из-за сейсмической активности в регионе.

В результате исследования методов газоочистки на объектах энергетики, были определены наиболее перспективные методы для Алматинских ТЭЦ и предложен относительно новый технологический процесс, который включает четыре основным этапа фильтрации дымовых газов. Для каждого этапа были определены математические модели, описывающие эффективность процесса фильтрации. Для оптимизации работы электрофильтра (второй ступени фильтрации) разработана нечеткая система регулирования напряженности коронирующих электродов на электрофильтре. В будущем планируется доказать устойчивость системы вместе с нечетким регулятором.

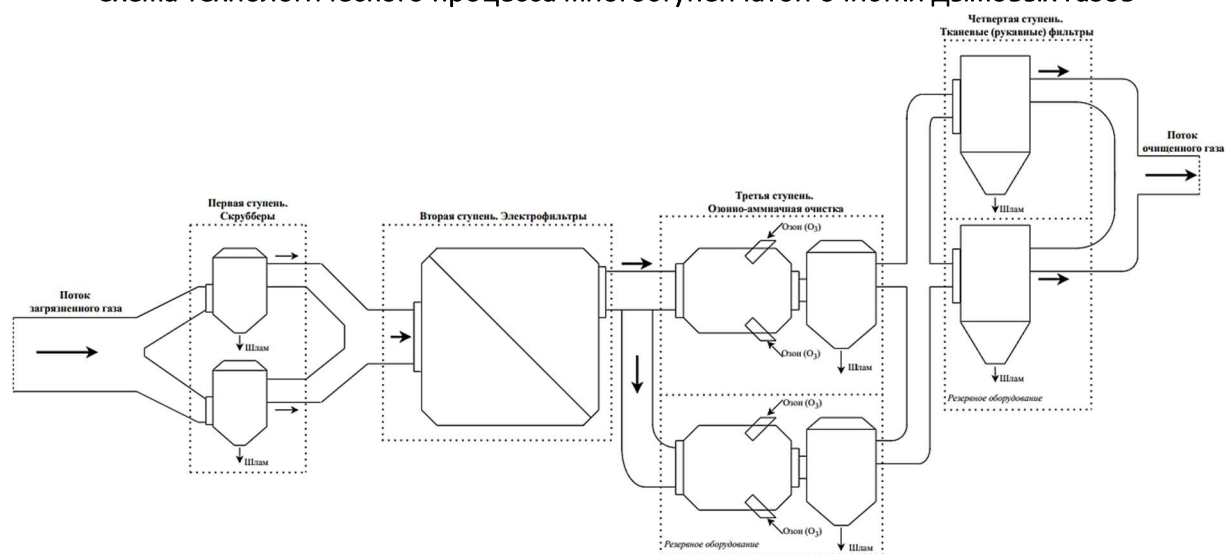
Также планируется разработать автоматизированную систему управления технологическим процессом фильтрации дымовых газов на основе модели распределенной системы управления.

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Приложение А

Схема технологического процесса многоступенчатой очистки дымовых газов



KOMPUTER ŞƏBƏKƏLƏRİNDƏ İSTİFADƏ EDİLƏN ELEMENTLƏR

Leyla Bəylər qızı Xanbatova

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Abstract

Physical Devices: Network Interface Card (NIC): Connects computers to a network.
Router: Directs data between networks.
Switch: Connects devices and optimizes data transmission within a network.
Hub: Broadcasts data to all connected devices (less commonly used now).
Modem: Converts internet signals into a usable format.
Access Point: Connects wireless devices to a network.
Cables: Ethernet and fiber-optic cables used for data transmission.
Software: TCP/IP, DNS, HTTP/HTTPS: Essential protocols for data transfer and management.
Firewall and VPN: Ensure network security.
Monitoring Tools: Used for network management and performance tracking.
Security Devices: Antivirus and Proxy Servers: Protect the network from malware and unauthorized access.
DDoS Protection and DPI: Enhance security and prevent cyberattacks.
Emerging Technologies: SDN (Software-Defined Networking): Networks managed through software.
IoT and 5G: Enable the Internet of Things and high-speed mobile networks.
Zero Trust Architecture: Creates a secure network environment.
Network Topologies: Bus, Star, Ring, Mesh: Different types of network structures.
VLAN: Segments networks into logical groups for easier management.
Keywords: Network Equipment: Router, Switch, Hub, Modem, Access Point. Protocols: TCP/IP, HTTP, HTTPS, DNS, FTP. Network Security: Firewall, VPN, Antivirus, Proxy Server, DDoS Protection. Wireless Network: Wi-Fi, Access Point, Antenna. Network Management:: Star, Ring, Bus, Mesh, Hybrid, VLAN. New Technologies: IoT, 5G, SDN, Zero Trust Architecture. Data Storage: NAS, SAN, Cloud Computing. Network Tools: Nagios, SolarWinds, PRTG,. Network Infrastructure Elements:

Xülasə

Fiziki Avadanlıqlar: Şəbəkə Kartı (NIC): Kompüterə şəbəkəyə qoşur.
Router: Şəbəkələr arasında məlumatları yönləndirir.
Switch: Şəbəkə cihazlarını birləşdirir, məlumat ötürməsini optimallaşdırır.
Hub: Məlumatı bütün cihazlara göndərir (artıq az istifadə olunur).
Modem: İnternet siqnallarını uyğun formata çevirir.
Access Point: Simsiz cihazları şəbəkəyə qoşur.
Kablolar: Ethernet və fiber-optik kimi məlumat ötürmə vasitələri.
Proqram Təminatları: TCP/IP, DNS, HTTP/HTTPS: Məlumatların ötürülməsi və idarə olunması üçün protokollar.
Firewall və VPN: Şəbəkə təhlükəsizliyini təmin edir. *Monitoring Alətləri:* Şəbəkənin idarə olunması və nəzarəti üçün.
Təhlükəsizlik Avadanlıqları: Antivirus və Proxy Serverlər: Şəbəkəni zərərli hücumlardan qoruyur.
DDoS Qoruma və DPI: Təhlükəsizliyi artırır, hücumların qarşısını alır.

Yeni Texnologiyalar:SDN (Software-Defined Networking): Proqram əsaslı şəbəkə idarəetməsi.

IoT və 5G: Əşyaların internetə qoşulması və yüksək sürətli mobil şəbəkələr.

Zero Trust Arxitekturası: Təhlükəsiz şəbəkə mühiti yaradır.

Şəbəkə Topologiyaları:Bus, Star, Ring, Mesh: Fərqli şəbəkə quruluşları.

VLAN: Şəbəkəni loqik qruplara bölmə.

Açar sözlər: Şəbəkə Avadanlıqları: Router, Switch, Hub, Modem, Access Point. Protokollar: TCP/IP, HTTP, HTTPS, DNS, FTP. Şəbəkə Təhlükəsizliyi: Firewall, VPN, Antivirus, Proxy Server, DDoS Protection. Simsiz Şəbəkə: Wi-Fi, Access Point, Antenna. Şəbəkə İdarəetməsi: Star, Ring, Bus, Mesh, Hybrid, VLAN. Yeni Texnologiyalar: IoT, 5G, SDN, Zero Trust Architecture. Məlumat Saxlama: NAS, SAN, Cloud Computing. Şəbəkə Alətləri: Nagios, SolarWinds, PRTG. Şəbəkə İnfrastruktur Elementləri:

Komputer şəbəkələrində istifadə edilən elementlər müxtəlif növ cihazlar, proqram təminatları və rabitə vasitələrindən ibarətdir. Bunlar aşağıdakı kimi təsnif edilir:

Fiziki Avadanlıqlar

Şəbəkə kartı (NIC - Network Interface Card): Kompüterin şəbəkəyə qoşulması üçün tələb olunan cihazdır. Həm simli (Ethernet), həm də simsiz (Wi-Fi) variantları mövcuddur.

Router (Marşrutlayıcı): Şəbəkələr arasında məlumatların istiqamətləndirilməsini təmin edir. Ev və ofis şəbəkələrində geniş istifadə olunur.

Switch (Kommütator): Şəbəkə cihazlarını birləşdirərək məlumatların ötürülməsini təşkil edir. Yerli şəbəkələrdə (LAN) məlumat paketlərinin yönləndirilməsi üçün istifadə olunur.

Hub (Həb): Məlumat paketlərini şəbəkədəki bütün cihazlara ötürür. Switch-lə müqayisədə daha az səmərəlidir və artıq nadir hallarda istifadə olunur.

Access Point (AP - Giriş nöqtəsi): Simsiz cihazların şəbəkəyə qoşulmasına imkan yaradır. Adətən Wi-Fi şəbəkələrində istifadə olunur.

Modem: İnternet provayderindən (ISP) gələn siqnalları kompüter üçün uyğun formata çevirir. DSL, kabel və ya fiber-optik variantları mövcuddur.

Kablolar və Konnektorlar:

Ethernet kabelləri (UTP/STP): Məlumatların simli ötürülməsi üçün istifadə olunur.

Fiber-optik kabellər: Daha sürətli və uzaq məsafəyə məlumat ötürülməsi üçün idealdır.

RJ45 konnektorları: Ethernet kabellərini şəbəkə cihazlarına qoşmaq üçün istifadə olunur.

Proqram Təminatları

Şəbəkə Protokolları:

TCP/IP: İnternet və şəbəkələrdə məlumat ötürülməsi üçün əsas protokol dəstidir.

HTTP/HTTPS: Veb trafiki idarə edir.

FTP: Fayl ötürülməsi üçün istifadə olunur.

DNS: Domen adlarını IP ünvanlarına çevirir.

Firewall (Şəbəkə Təhlükəsizlik Divarı): Şəbəkəni zərərli hücumlara qarşı qoruyur və trafiki idarə edir.

Şəbəkə İdarəetmə Proqramları: Şəbəkənin işini monitoring etmək, optimallaşdırmaq və idarə etmək üçün istifadə olunur.

Nagios, SolarWinds, PRTG Network Monitor kimi alətlər geniş istifadə olunur.

Simsiz Şəbəkə Elementləri

Wi-Fi Routerlər və Access Pointlər: Simsiz cihazları şəbəkəyə qoşmaq üçün əsas elementlərdir.

Simsiz Antennalar: Şəbəkə signalının əhatə dairəsini genişləndirir.

Şəbəkə Təhlükəsizlik Avadanlıqları

VPN (Virtual Private Network): Şəxsi şəbəkələr üzərində təhlükəsiz bağlantılar yaradır.

IDS/IPS Sistemləri (Intrusion Detection/Prevention Systems):

Şəbəkəyə olan hücumları aşkarlayır və onların qarşısını alır. Bu elementlər birgə işləyərək kompüter şəbəkələrinin qurulmasını və idarə olunmasını təmin edir. Kompüter şəbəkələrində istifadə edilən elementlərin davamı olaraq, bəzi xüsusi növlər, anlayışlar və onların funksiyaları haqqında ətraflı məlumat:

Şəbəkə Topologiyaları və Konsepsiyaları

Şəbəkə Topologiyaları: Bus (Avtobus) Topologiyası: Şəbəkənin bütün cihazları eyni xəttə qoşulur. Sadə və ucuzdur, lakin bir problem bütün şəbəkəyə təsir göstərə bilər.

Star (Ulduz) Topologiyası: Şəbəkənin bütün cihazları mərkəzi bir cihazla (məsələn, switch və ya hub) birləşir.

Ring (Halqa) Topologiyası: Cihazlar dairəvi formada birləşir. Sinyallar dövr edərək təyinatına çatır.

Mesh (Tor) Topologiyası: Bütün cihazlar birbaşa bir-birilə bağlıdır. Yüksək etibarlılıq təmin edir.

Hybrid (Hibrid) Topologiya: Yuxarıdakı topologiyaların kombinasiyasından ibarətdir.

VLAN (Virtual LAN):

Şəbəkə cihazlarını fiziki birləşmədən asılı olmayaraq ayrı-ayrı loqik qruplara bölmək üçün istifadə olunur.

QoS (Quality of Service): Şəbəkədə müəyyən trafik prioritetləşdirərək video, səs və digər önəmli məlumatların gecikmədən ötürülməsini təmin edir.

Load Balancing: Şəbəkə yüklərini birdən çox cihaz arasında bölərək səmərəliliyi artırır və yüksək əlçatanlığı təmin edir.

Data Center və Bulud Texnologiyaları Data Center Avadanlıqları:

Serverlər: Məlumatların saxlanması və işlənməsi üçün istifadə olunur.

Blade Serverlər: Şəbəkədə daha kompakt və yüksək performanslı serverlərdir.

Storage Systems (NAS/SAN): Məlumatların saxlanması üçün xüsusi qurğulardır.

NAS (Network Attached Storage): Şəbəkə üzərində məlumat saxlama və paylaşma cihazıdır.

SAN (Storage Area Network): Yüksək sürətli məlumat saxlama şəbəkəsidir.

Bulud Şəbəkə Avadanlıqları:

Bulud Təminatçıları: AWS, Microsoft Azure, Google Cloud kimi platformalar.

Orkestrasiya Alətləri: Bulud resurslarının idarə edilməsi üçün Kubernetes, Docker kimi texnologiyalar.

Şəbəkə Təhlükəsizliyi və Monitoring Elementləri Antivirus və Antimalware: Şəbəkəyə və cihazlara daxil olan zərərli proqramların qarşısını almaq üçün istifadə olunur.

Proxy Server: İstifadəçilər və internet arasında vasitəçi rolunu oynayaraq təhlükəsizliyi artırır və məzmun filtrası təmin edir.

DPI (Deep Packet Inspection): Trafiki analiz edərək potensial təhlükələri və icazəsiz məlumat ötürmələrini aşkarlayır.

Şəbəkə Monitoringi: SNMP (Simple Network Management Protocol): Şəbəkə cihazlarının vəziyyətini izləmək üçün istifadə olunur.

NetFlow: Trafik analizi üçün məlumat toplayır.

DDoS Qoruma Sistemləri: Şəbəkəyə yönəlmiş yüksək həcmli xidmət əngəlləmə hücumlarına qarşı müdafiə edir.

Yeni Texnologiyalar və Trendlər

SDN (Software-Defined Networking): Şəbəkənin idarə edilməsini proqram təminatı vasitəsilə avtomatlaşdırır və dinamikliyi artırır.

IoT (Internet of Things): Əşyaların internetə qoşulması ilə daha çox cihaz şəbəkəyə inteqrasiya olunur. IoT cihazları üçün xüsusi şəbəkə protokolları, məsələn, **MQTT**, istifadə olunur.

5G Şəbəkələri: Yüksək sürət, aşağı gecikmə və geniş bağlantı imkanı təmin edir. Mobil və IoT cihazlar üçün geniş istifadə olunur.

Zero Trust Şəbəkə Arxitekturası: Şəbəkəyə qoşulan bütün cihazlar və istifadəçilər mütləq olaraq autentifikasiya olunur. Bu elementlərin hamısı birlikdə işləyərək, şəbəkənin funksionallığını, təhlükəsizliyini və effektivliyini təmin edir. Şəbəkələrin inkişafı ilə daha çox yeni texnologiyalar və avadanlıqlar ortaya çıxır, bu da daha sürətli, təhlükəsiz və etibarlı sistemlər qurmağa imkan yaradır.

Nəticə: *Komputer şəbəkələri müasir texnologiyanın əsasını təşkil edən mürəkkəb sistemlərdir. Onlar cihazların, proqramların və rabitə vasitələrinin harmonik şəkildə işləməsini təmin edir.*

Əsas Avadanlıqlar və Protokollar: *Şəbəkələr router, switch, access point kimi fiziki elementlərdən və TCP/IP, DNS, HTTP/HTTPS kimi protokollardan istifadə edir. Bu elementlər şəbəkələrin işini təşkil edir və məlumatların etibarlı şəkildə ötürülməsini təmin edir.*

Təhlükəsizlik: *Firewall, VPN, antivirus kimi sistemlər şəbəkənin təhlükəsizliyini qoruyur, DDoS hücumlarına və zərərli proqramlara qarşı müdafiəni təmin edir.*

İnnovasiyalar və Gələcək: *SDN, IoT və 5G kimi yeni texnologiyalar şəbəkələrin daha çevik, sürətli və təhlükəsiz olmasını təmin edir. Bu yeniliklər şəbəkələrin tətbiq sahələrini genişləndirir və daha geniş miqyaslı bağlantılar yaradır.*

Tətbiq Sahələri: *Komputer şəbəkələri biznes, təhsil, səhiyyə, əyləncə və daha çox sahədə istifadə olunur. Onlar məlumat paylaşımını asanlaşdırır, iş proseslərini avtomatlaşdırır və global əlaqələri mümkün edir.*

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ЦИФРОВЫЕ ЭКОСИСТЕМЫ В УПРАВЛЕНИИ КАЗАХСТАНСКИХ ПРЕДПРИЯТИЙ

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Аннотация. В данной статье проводится комплексный анализ цифровых экосистем как стратегического инструмента управления казахстанскими предприятиями в условиях глобальной цифровой трансформации. Особое внимание уделено теоретическим аспектам и концепциям цифровых экосистем, включая их структуру, ключевые компоненты и механизмы взаимодействия. Рассматриваются современные технологии, такие как искусственный интеллект, интернет вещей и блокчейн, их роль в оптимизации бизнес-процессов и укреплении конкурентоспособности предприятий. Исследование акцентирует внимание на текущем состоянии цифровизации в Казахстане, ключевых инициативах государства, включая программу "Цифровой Казахстан", а также на проблемах и барьерах, препятствующих внедрению цифровых решений. В статье представлены практические рекомендации для малых и средних предприятий, крупных корпораций и органов государственной власти, направленные на интеграцию передовых технологий и развитие цифровых экосистем. В заключении обозначены перспективы дальнейших исследований, включая изучение международного опыта, анализ региональных особенностей и разработку новых моделей партнерского взаимодействия.

Ключевые слова: цифровые экосистемы, цифровизация, управление предприятиями, искусственный интеллект, интернет вещей, блокчейн, Казахстан, цифровая трансформация, малый и средний бизнес, "Цифровой Казахстан".

Цифровизация управления предприятиями в современных условиях представляет собой один из ключевых факторов обеспечения конкурентоспособности и устойчивого экономического роста. Казахстан, как развивающаяся страна с высоким потенциалом внедрения цифровых технологий, уделяет особое внимание этому направлению, о чем свидетельствует реализация национальной программы "Цифровой Казахстан". Данная инициатива направлена на стимулирование цифровой трансформации в бизнесе, включая создание и развитие цифровых экосистем. Последние представляют собой сложные структуры, объединяющие технологии, данные, платформы и участников для повышения эффективности бизнес-процессов. В условиях глобальной цифровой экономики казахстанские предприятия сталкиваются с вызовами, требующими активного внедрения таких решений для адаптации к современным реалиям.

Актуальность данной темы объясняется необходимостью адаптации отечественных предприятий к изменяющимся условиям рынка, усилению их интеграции в международные цепочки добавленной стоимости и повышения уровня взаимодействия между участниками бизнес-экосистем. Цифровые экосистемы становятся важным инструментом не только для оптимизации процессов управления, но и для создания новых бизнес-моделей, которые обеспечивают устойчивый рост и инновационное развитие. В контексте Казахстана эта тема особенно значима ввиду необходимости снижения зависимости от сырьевых отраслей и диверсификации экономики, что предполагает активное внедрение современных технологий.

Целью настоящей работы является комплексное исследование цифровых экосистем и их роли в управлении казахстанскими предприятиями. Основные задачи исследования включают анализ теоретических основ цифровых экосистем, оценку текущего уровня цифровизации отечественных предприятий, выявление преимуществ и барьеров их внедрения, а также определение перспектив их дальнейшего развития. Такой подход позволяет не только сформировать целостное представление о феномене цифровых экосистем, но и предложить рекомендации для повышения их эффективности в условиях казахстанского контекста.

Методология исследования базируется на применении системного подхода, включая анализ существующей литературы, изучение практических кейсов, а также использование методов сравнительного анализа. Научные публикации и отчеты послужили основой для анализа теоретических аспектов цифровых экосистем и их структуры. Кейс-анализ позволил изучить успешные примеры их применения на казахстанских предприятиях. Сравнительный анализ с международными практиками дал возможность выявить уникальные особенности цифровизации в Казахстане и обозначить направления для совершенствования. Такой междисциплинарный подход обеспечивает глубину и всесторонность исследования, что важно для получения объективных результатов.

Таким образом, исследование цифровых экосистем в управлении казахстанскими предприятиями является не только актуальным, но и востребованным в научной и практической плоскостях. Полученные результаты могут быть использованы для разработки стратегий цифровизации, направленных на повышение конкурентоспособности отечественных предприятий в условиях глобальной цифровой трансформации.

Цифровые экосистемы представляют собой сложные интегрированные сети, объединяющие предприятия, пользователей, технологии и данные для совместного создания ценности. Они основаны на теории экосистемного подхода, который рассматривает такие структуры как самоорганизующиеся системы, обеспечивающие взаимодействие и координацию участников через цифровые платформы. Впервые концепция цифровых экосистем была подробно изучена Джеймсом Муром в контексте бизнес-экосистем, где ключевыми элементами стали сетевой эффект, адаптивность и децентрализация. Эти характеристики делают цифровые экосистемы крайне важными для управления предприятиями, особенно в условиях быстро меняющегося рынка и растущей конкуренции [1]. В управленческом контексте цифровые экосистемы выступают инструментом для интеграции процессов, автоматизации операций и ускорения принятия решений, что делает их критически важными для повышения эффективности бизнеса.



Рисунок 1-Основные компоненты цифровых экосистем

Основными компонентами цифровых экосистем являются платформы, технологии и пользователи. Платформы формируют основу экосистемы, предоставляя инфраструктуру

для взаимодействия и обмена данными между участниками. Это могут быть облачные хранилища данных, аналитические системы или маркетплейсы. Примеры таких платформ включают глобальные решения, такие как Google Cloud или Amazon Web Services, а также локальные казахстанские разработки. Технологии являются движущей силой экосистемы и включают искусственный интеллект для анализа данных и прогнозирования, интернет вещей (IoT) для взаимодействия устройств, большие данные (Big Data) для работы с информацией, а также блокчейн, который обеспечивает безопасность и прозрачность транзакций [2]. Пользователи, включая компании, потребителей и других участников, занимают центральное место в экосистеме, определяя ее ценность и эффективность через уровень своей вовлеченности и способности адаптироваться к новым цифровым решениям.

Роль цифровых экосистем в управлении предприятиями трудно переоценить, поскольку они обеспечивают значительные преимущества. Во-первых, цифровые экосистемы способствуют оптимизации бизнес-процессов через автоматизацию и интеграцию данных, что позволяет предприятиям сокращать временные затраты и снижать издержки. Во-вторых, они повышают прозрачность управления за счет использования аналитических инструментов, которые предоставляют точные данные в реальном времени. В-третьих, экосистемы способствуют развитию гибкости управления, позволяя быстро реагировать на изменения рынка и разрабатывать новые бизнес-модели, такие как платформенная экономика. Однако, несмотря на преимущества, цифровые экосистемы сталкиваются с рядом вызовов. К числу наиболее распространенных проблем относятся технические сложности, такие как интеграция устаревших систем, финансовые ограничения, связанные с высокой стоимостью внедрения технологий, а также недостаток квалифицированных кадров, способных управлять этими сложными структурами. Кроме того, цифровые экосистемы уязвимы перед киберугрозами, что требует повышенного внимания к вопросам безопасности данных [3].

В контексте Казахстана цифровые экосистемы играют особую роль, так как их внедрение может значительно повысить конкурентоспособность отечественных предприятий. Тем не менее, их развитие сопряжено с рядом проблем, включая ограниченные инвестиции и низкий уровень цифровой грамотности. Несмотря на эти барьеры, перспективы цифровых экосистем в Казахстане остаются высокими благодаря государственной поддержке, таким инициативам, как программа "Цифровой Казахстан", и глобальным трендам в области цифровизации. Это делает изучение цифровых экосистем и их внедрение в управление предприятиями актуальной и важной задачей для экономического развития страны.

Цифровизация управления предприятиями в Казахстане находится на этапе активного развития, что обусловлено необходимостью повышения конкурентоспособности и интеграции страны в мировую экономику. В последние годы был зафиксирован значительный рост интереса казахстанских предприятий к цифровым технологиям, однако степень их внедрения остается неоднородной. Одной из ключевых тенденций является увеличение использования цифровых платформ, аналитических инструментов и автоматизированных систем управления, что подтверждается ростом инвестиций в IT-инфраструктуру. При этом крупные предприятия, особенно в нефтегазовом и горнодобывающем секторах, демонстрируют более высокий уровень цифровизации по сравнению с малыми и средними предприятиями (МСП), которые сталкиваются с ограничениями в финансах и доступе к технологиям.

Текущие показатели цифровизации включают увеличение числа предприятий, использующих облачные технологии, цифровую аналитику и интернет вещей (IoT). Например, по данным Министерства цифрового развития Казахстана, в 2022 году более 40% предприятий внедрило базовые цифровые инструменты, такие как ERP-системы и CRM-

платформы. В то же время уровень использования более продвинутых технологий, таких как искусственный интеллект и блокчейн, остается ограниченным и в основном представлен в крупных компаниях.

Особое внимание в цифровизации уделяется государственным инициативам, среди которых ключевую роль играет программа "Цифровой Казахстан". Эта программа была разработана с целью ускорения цифровой трансформации страны и включает пять основных направлений: развитие человеческого капитала, цифровую инфраструктуру, цифровизацию экономики, электронное правительство и инновационную экосистему. Одним из достижений программы стало создание цифровых платформ для бизнеса, таких как портал egov.kz и электронная система закупок goszakup.gov.kz, которые упростили взаимодействие между предприятиями и государством [4].

Кроме того, в рамках "Цифрового Казахстана" реализуются проекты по внедрению интернет вещей в сельском хозяйстве, автоматизации производственных процессов на промышленных предприятиях и созданию центров инновационного развития. Государство активно поддерживает стартапы и инновационные компании через финансирование и развитие специальных технопарков, таких как Astana Hub, который стал важной площадкой для стартапов в области IT и цифровых технологий.

Несмотря на прогресс, цифровизация в Казахстане сталкивается с рядом вызовов, включая недостаток высококвалифицированных кадров, ограниченную IT-инфраструктуру в регионах и недостаточное финансирование для МСП. Однако эти проблемы постепенно решаются за счет государственной поддержки, международного сотрудничества и привлечения инвестиций в цифровую трансформацию. В целом, развитие цифровых экосистем в Казахстане имеет высокий потенциал для ускорения экономического роста и повышения эффективности управления предприятиями, особенно в условиях глобальной цифровой трансформации.

Таблица 1-Примеры цифровых экосистем в управлении казахстанских предприятий

Компания/Проект	Описание цифровой экосистемы	Ключевые технологии	Результаты/Эффекты
Kaspi.kz	Финансовая экосистема, включающая платформу для онлайн-банкинга, электронной коммерции и платежей.	Мобильные приложения, Big Data, аналитика	Рост числа пользователей, упрощение финансовых операций.
Astana Hub	Технопарк, поддерживающий IT-стартапы и инновационные проекты в области цифровых технологий.	IoT, блокчейн, искусственный интеллект	Создание более 500 стартапов, развитие IT-экосистемы.
АО «Казахтелеком»	Цифровизация телекоммуникационных услуг с использованием Big Data, IoT и облачных технологий.	IoT, облачные вычисления, аналитика	Увеличение скорости передачи данных, оптимизация сервисов.
Halyk Bank	Интеграция мобильного банкинга, платежных систем и цифровых карт для оптимизации финансовых услуг.	Мобильные технологии, кибербезопасность	Увеличение числа клиентов, рост доверия к цифровым услугам.
Kaz Minerals	Автоматизация горнодобывающих процессов с использованием IoT и аналитических систем.	IoT, Big Data, автоматизация	Снижение затрат на производство, повышение производительности.
Samruk-Kazyna Trust	Цифровая платформа для управления социальными проектами и благотворительностью.	Платформенные технологии, управление данными	Улучшение прозрачности проектов, увеличение вовлеченности.
QazTrade	Платформа для поддержки экспорта и международной торговли, основанная на цифровой аналитике.	Big Data, аналитика, экспортные платформы	Поддержка экспортных операций, улучшение аналитики.
Агропортал Qoldau.kz	Цифровой инструмент для сельского хозяйства, включающий GIS-аналитику, прогнозы и управление субсидиями.	GIS, Big Data, аналитика	Повышение урожайности, упрощение доступа к субсидиям.

Цифровые технологии оказывают значительное влияние на оптимизацию бизнес-процессов, обеспечивая предприятиям новые возможности для повышения эффективности и снижения затрат. Внедрение цифровых экосистем позволяет автоматизировать рутинные задачи, улучшать координацию между подразделениями и принимать более обоснованные управленческие решения на основе анализа данных.

Один из ключевых аспектов оптимизации заключается в автоматизации процессов, таких как учет, логистика, закупки и управление цепочками поставок. Цифровые инструменты, такие как ERP-системы (системы управления ресурсами предприятия), помогают интегрировать различные бизнес-функции в единую платформу, что снижает количество ошибок и временные затраты. Например, внедрение систем управления запасами на основе аналитики больших данных позволяет компаниям минимизировать излишки и избежать дефицита товаров, повышая общую производительность.

Использование облачных технологий и IoT (Интернет вещей) предоставляет предприятиям возможность мониторить производственные процессы в реальном времени. Такие решения особенно важны для производственных и горнодобывающих компаний, где своевременная информация о состоянии оборудования позволяет предотвратить аварии и сократить время простоя. В Казахстане подобные технологии активно используются, например, в горнодобывающих предприятиях, где IoT-устройства собирают данные о температуре, вибрации и других параметрах для анализа и быстрого реагирования [5].

Искусственный интеллект и машинное обучение также играют ключевую роль в оптимизации бизнес-процессов. Эти технологии используются для прогнозирования спроса, анализа поведения клиентов и автоматизации принятия решений. Например, в сфере финансов и ритейла алгоритмы AI помогают анализировать большие объемы данных, оптимизировать ценообразование и персонализировать предложения для клиентов.

Большие данные (Big Data) и аналитика позволяют предприятиям не только лучше понимать текущие процессы, но и предсказывать возможные проблемы и оптимизировать ресурсы. Например, анализ данных о производительности сотрудников или потреблении энергии помогает улучшать внутренние процессы и снижать затраты [6].

В контексте Казахстана внедрение цифровых технологий для оптимизации бизнес-процессов способствует повышению конкурентоспособности предприятий на региональном и международном уровнях. Государственные инициативы, такие как "Цифровой Казахстан", играют важную роль в создании инфраструктуры и стимулов для цифровой трансформации. Однако для достижения максимального эффекта необходимо преодолевать барьеры, такие как недостаток квалифицированных кадров и ограниченные инвестиции в IT-сектор. Несмотря на это, потенциал цифровизации для оптимизации бизнес-процессов в Казахстане огромен, особенно в таких секторах, как производство, финансы и сельское хозяйство.

Цифровые экосистемы играют важную роль в укреплении конкурентоспособности предприятий, создавая условия для более эффективного использования ресурсов, повышения производительности и ускорения инновационного развития. Основным механизмом укрепления конкурентоспособности является интеграция участников экосистемы, таких как поставщики, партнеры, клиенты и государственные структуры, в единую платформу, что улучшает взаимодействие и координацию.

Одним из главных преимуществ цифровых экосистем является снижение транзакционных издержек благодаря цифровизации процессов. Например, использование цифровых платформ для управления цепочками поставок позволяет предприятиям оперативно координировать действия с партнерами, минимизировать логистические издержки и сокращать сроки поставок. Это особенно важно в Казахстане, где предприятия сталкиваются с географическими вызовами и необходимостью оптимизации транспортных затрат.

Цифровые экосистемы также способствуют инновациям, обеспечивая предприятия доступом к новым технологиям и лучшим практикам. Например, в Казахстане такие платформы, как Astana Hub, предоставляют стартапам и предприятиям возможность развивать и внедрять инновационные решения, которые повышают их конкурентоспособность на международных рынках. Это способствует созданию новых бизнес-моделей, таких как платформенная экономика, где компании получают возможность монетизировать свои услуги через цифровые каналы.

Еще одним важным фактором является возможность адаптации предприятий к изменениям на рынке. Цифровые экосистемы предоставляют инструменты для анализа данных в реальном времени, что позволяет бизнесу быстро реагировать на изменения потребительских предпочтений, рыночных условий или нормативной базы. Например, финтех-экосистемы, такие как Kaspi.kz, помогают компаниям оптимизировать клиентский

сервис и предоставлять персонализированные услуги, что укрепляет их конкурентные позиции.

В условиях Казахстана использование цифровых экосистем становится важным стратегическим инструментом для предприятий, стремящихся повысить свою эффективность и выйти на новые рынки. Однако для успешного внедрения необходимо решить проблемы, связанные с ограниченным доступом к технологиям в регионах и недостатком квалифицированных кадров.

Управление данными и использование аналитики на основе больших данных и искусственного интеллекта (AI) стали ключевыми аспектами цифровой трансформации. Большие данные (Big Data) позволяют предприятиям собирать, обрабатывать и анализировать огромные объемы информации, что дает возможность принимать более обоснованные и точные решения. В свою очередь, искусственный интеллект автоматизирует процессы анализа, предсказывает события и помогает предприятиям оптимизировать свою деятельность.

Одной из ключевых сфер применения больших данных является анализ поведения клиентов. Компании используют данные о покупках, предпочтениях и активности клиентов для разработки персонализированных предложений и повышения уровня их удовлетворенности. Например, в Казахстане крупные банки, такие как Halyk Bank, применяют аналитические системы для сегментации клиентов и автоматизации процесса принятия решений по кредитованию.

В области производства данные с IoT-устройств (интернет вещей) используются для мониторинга оборудования, предиктивного обслуживания и оптимизации производственных процессов. Такие технологии активно внедряются в горнодобывающей отрасли Казахстана, где анализ данных с оборудования помогает предотвратить аварии и минимизировать простои.

Искусственный интеллект также играет ключевую роль в повышении эффективности управления данными. Алгоритмы машинного обучения используются для прогнозирования спроса, анализа рисков и выявления аномалий. Например, в торговле AI помогает предприятиям оптимизировать запасы и распределение ресурсов, а в финансах — автоматизировать процессы управления рисками и проверок на соответствие нормативным требованиям.

Государственные проекты, такие как "Цифровой Казахстан", также способствуют развитию аналитики и AI, внедряя их в сфере госуслуг и городского управления. Например, использование больших данных в транспортной системе помогает оптимизировать маршруты общественного транспорта, снижая затраты и улучшая качество услуг.

В целом, управление данными и применение аналитики в Казахстане находятся на этапе активного развития. Однако для масштабного использования технологий Big Data и AI необходимо расширять доступ к данным, развивать IT-инфраструктуру и повышать квалификацию специалистов. При условии преодоления этих барьеров аналитика и искусственный интеллект станут важными драйверами роста и эффективности для казахстанских предприятий [7].

Таблица 2-Проблемы и барьеры внедрения цифровых экосистем

Категория барьеров	Описание барьеров	Примеры последствий	Возможные решения
Технические барьеры	Недостаточная инфраструктура, особенно в регионах, ограниченный доступ к интернету, киберриски и уязвимость данных.	Замедление внедрения цифровых технологий, увеличение риска утечек данных.	Развитие инфраструктуры, усиление кибербезопасности, поддержка региональных IT-инициатив.
Экономические барьеры	Высокая стоимость внедрения цифровых технологий, ограниченные инвестиции, особенно для малых и средних предприятий.	Недоступность передовых технологий для большинства предприятий, ограничение инноваций.	Субсидии и налоговые льготы для бизнеса, государственные программы финансирования цифровизации.
Культурные и организационные барьеры	Низкий уровень цифровой грамотности среди сотрудников, сопротивление изменениям, недостаток квалифицированных кадров.	Сопротивление сотрудников внедрению новых технологий, снижение эффективности проектов.	Обучение сотрудников, программы повышения цифровой грамотности, привлечение специалистов.

Перспективы развития цифровых экосистем в Казахстане связаны с внедрением передовых технологий, расширением участия малого и среднего бизнеса (МСП), а также укреплением взаимодействия между государством и частным сектором. Основные направления трансформации включают использование искусственного интеллекта (AI), интернета вещей (IoT) и блокчейна. Эти технологии позволяют значительно повысить эффективность и прозрачность бизнес-процессов. Искусственный интеллект активно используется для анализа больших данных, прогнозирования и автоматизации процессов, особенно в таких сферах, как здравоохранение, финансы, сельское хозяйство и горнодобывающая промышленность. IoT открывает возможности для управления производственными процессами в реальном времени, а блокчейн обеспечивает прозрачность и безопасность операций, что особенно важно для финансового сектора и логистики. Внедрение этих технологий способно не только повысить конкурентоспособность предприятий, но и ускорить цифровую трансформацию экономики в целом.

Расширение участия МСП в цифровых экосистемах является ключевым фактором для устойчивого экономического роста. Малые и средние предприятия составляют значительную часть экономики Казахстана, но их интеграция в цифровые экосистемы пока ограничена из-за высоких затрат на внедрение технологий и недостатка знаний. Государственные субсидии, гранты и налоговые льготы могут упростить доступ МСП к технологиям. Развитие цифровых платформ, которые облегчают взаимодействие между крупными компаниями, государственными структурами и МСП, позволит последним использовать преимущества цифровизации. Важным элементом является обучение и повышение квалификации сотрудников, что сделает цифровую трансформацию более доступной и эффективной для малого и среднего бизнеса [8].

Государство играет ключевую роль в формировании условий для развития цифровых экосистем. Одним из важных направлений является укрепление публично-частного партнерства (ГЧП), которое позволяет объединять ресурсы и компетенции государства и бизнеса для реализации крупных инфраструктурных проектов. Создание технопарков и инновационных центров, таких как Astana Hub, способствует развитию стартапов и внедрению передовых технологий. Государственные программы, такие как "Цифровой Казахстан", продолжают стимулировать цифровизацию через развитие инфраструктуры, поддержку регионов и создание нормативно-правовой базы. Участие международных партнеров в технологической трансформации предоставляет Казахстану доступ к новым знаниям и инструментам, что ускоряет развитие цифровых экосистем.

В заключение можно отметить, что перспективы развития цифровых экосистем в Казахстане являются значительными, однако для их реализации необходимо преодолеть ряд барьеров, включая недостаток квалифицированных кадров, ограниченные ресурсы у МСП и необходимость расширения инфраструктуры. Успешная реализация этих направлений укрепит позиции Казахстана на мировом рынке и повысит эффективность национальной экономики.

В качестве итогов статьи можно выделить ключевые выводы. Во-первых, цифровые экосистемы играют важную роль в повышении эффективности управления предприятиями, оптимизации процессов и укреплении конкурентоспособности. Во-вторых, успешное внедрение цифровых экосистем в Казахстане требует активного участия всех сторон, включая государство, частный сектор и образовательные учреждения. В-третьих, для малых и средних предприятий особенно важна поддержка, позволяющая интегрироваться в цифровую экономику.

В качестве рекомендаций для предприятий можно предложить активное внедрение передовых технологий, таких как IoT и AI, а также повышение квалификации сотрудников. Государству следует продолжать поддержку цифровизации через развитие инфраструктуры, субсидирование инновационных проектов и обучение специалистов. Публично-частное партнерство остается важным инструментом для реализации крупных проектов.

Будущие исследования могут быть направлены на изучение конкретных кейсов внедрения цифровых экосистем, анализ международного опыта и разработку новых подходов к интеграции МСП в цифровую экономику. Особое внимание стоит уделить вопросам кибербезопасности и правового регулирования цифровых платформ.

Pedagogical Sciences

СОЗДАНИИ ИНТЕРАКТИВНОГО МУЛЬТИМЕДИЙНОГО КОНТЕНТА И МЕТОДЫ ОЦЕНКИ ЗНАНИЙ УЧЕНИКОВ С ИСПОЛЬЗОВАНИЕМ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА

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Аннотация

В последние десятилетия информатика стала одной из ключевых дисциплин в образовательной системе. Однако традиционные методы обучения не всегда могут удовлетворить потребности всех студентов. В ответ на эту проблему возникла необходимость внедрения адаптивных подходов, основанных на современных технологиях, такими как искусственный интеллект (ИИ). Адаптивные учебные материалы, использующие ИИ, позволяют персонализировать учебный процесс, подстраиваясь под индивидуальные способности и предпочтения учащихся.

Искусственный интеллект активно используется в системах онлайн-обучения для оценки знаний учащихся. Например, в платформах массового открытого онлайн-обучения (МООС) такие инструменты позволяют автоматически проверять выполненные задания, анализировать ошибки и предоставлять индивидуальные рекомендации. Это делает процесс обучения более интерактивным и эффективным.

Данная статья рассматривает актуальность использования интерактивных учебных материалов по информатике, а также механизмы, лежащие в основе адаптивного обучения. Мы проанализируем, как ИИ может быть использован для сбора и анализа данных о прогрессе учащихся, создания индивидуальных профилей и адаптации контента.

Ключевые слова: Адаптивное обучение, искусственный интеллект, информатика, интерактивные учебные материалы, персонализация, учебные платформы

Введение

В современном мире информационных технологий информатика стала не только обязательным предметом в школах, но и основой для многих профессий будущего. Научить учащихся основам программирования, алгоритмов и структуры данных - важная задача образования. Однако, несмотря на высокую значимость, традиционные методы обучения зачастую оказываются неэффективными для всех студентов. Учебный процесс становится

затруднённым, когда разные учащиеся имеют различные уровни подготовки и темпы восприятия материалов.

Искусственный интеллект стал неотъемлемой частью нашей жизни, влияя на каждую сферу человеческой жизни так, как мы никогда и не представляли возможным. Искусственный интеллект в образовании открыл новые возможности для преподавателей и для обучаемых всех возрастов. Сегодня ИИ коренным образом меняет подходы к работе и обучению. Слияние искусственного интеллекта и образования произвело революцию в традиционных методах обучения: от мобильных цифровых курсов до онлайн-справок и виртуальных классов, а также привело к появлению в отрасли совершенно новой концепции обучения. За последний год разработчики программного обучения выпустили ошеломляющее количество инструментов искусственного интеллекта, которые могут генерировать текст, изображения, музыку и видео без необходимости сложного кодирования, а просто в ответ на инструкции, данные на естественном языке. Эти технологии быстро совершенствуются, а разработчики внедряют новые возможности, которые всего несколько лет назад считались бы научной фантастикой. [1, 364 стр.]

В тексте выше демонстрирует невероятное влияние искусственного интеллекта на образование и нашу жизнь в целом. Я думаю, что искусственный интеллект радикально изменит не только традиционные методы образования, но и понимание того, как преподавать и учиться. Очень впечатляет, насколько быстры эти инструменты и, как правило, доступны только профессионалам в области программирования, но теперь они становятся доступными для широкого круга пользователей из-за простоты использования... Например, создание текстов, изображений или музыки с помощью ИИ может уменьшить препятствия для творческих людей и студентов и позволить им быстро реализовать свои идеи.

Однако с этим развитием также возникают такие проблемы, как конфиденциальность данных, технологическая зависимость и влияние на профессии. Мне кажется важным найти баланс, чтобы ИИ стал надежным инструментом, который поддерживает людей, а не заменяет их.

В целом, я считаю, что ИИ в образовании — это не только тенденция, но и важный шаг к инклюзивному и эффективному обучению, которое может раскрыть

Методы оценки знаний с помощью искусственного интеллекта (ИИ) появились в исследовательских лабораториях и нашли практическое применение в конкретных аудиториях для создания адаптивной учебной среды. Кроме того, некоторые из них встроены в системы онлайн-образования (например, МООС и другие платформы онлайн-образования) для предоставления качественного образования студентам по всему миру, экономя время и расходы. [2]

По моему мнению, использование методов искусственного интеллекта для оценки знаний и создания адаптивной учебной среды является революционным подходом к образованию. ИИ позволяет не только персонализировать обучение, но и масштабировать этот процесс, что особенно важно в контексте массового онлайн-образования.

Основным преимуществом таких систем является мгновенная обратная связь и возможность адаптировать контент к индивидуальным потребностям каждого учащегося. Это делает обучение более эффективным, чем традиционные методы, особенно для сложных тем, требующих глубокого понимания.

Применение ИИ в разработке адаптивных учебных материалов может включать в себя следующие аспекты:

- *генерация контента* - использование ИИ для автоматической генерации текстов, задач, вопросов и другого учебного контента, адаптированного к уровню знаний и

навыков студентов, может помочь преподавателям создавать разнообразные и индивидуализированные материалы для своих студентов

- *определение индивидуальных стратегий обучения* - ИИ может анализировать данные о студентах, например, их предыдущие успехи, предпочтения, обучающиеся стили и др., чтобы определить наиболее эффективные стратегии обучения для каждого студента
- *обратная связь и оценка* - ИИ может использоваться для предоставления мгновенной обратной связи студентам, а также анализа их ответов на задания с целью определения их прогресса, успеха и направлений для развития. [3, 65 стр.]

Интерактивный мультимедийный контент: особенности и преимущества

ИМК включает в себя видео, анимацию, виртуальную реальность, дополненную реальность и интерактивные приложения, которые могут вовлечь учащихся в процесс обучения. Создание такого контента требует нескольких ключевых аспектов:

1. *Простота использования*: независимо от уровня подготовки или технических навыков, важно, чтобы контент был интуитивно понятен и доступен для всех учащихся.
2. *Адаптивность*: технология искусственного интеллекта позволяет создавать контент, который адаптируется к индивидуальным потребностям учащихся. Система может изменять сложность задания в зависимости от успехов ученика.
3. *Визуальная привлекательность*: Эффективный искусственный интеллект должен быть не только информативным, но и визуально привлекательным, чтобы привлечь внимание учащихся.
4. *Интерактивность*: возможность взаимодействовать с контентом помогает учащимся лучше усваивать материал. Это включает в себя различные тесты, викторины, игры и симуляторы.

Методы создания интерактивного мультимедийного контента

Для создания учебных пособий можно использовать различные технологии и инструменты. Вот некоторые из них:

Средства разработки: программные решения, такие как Adobe Captivate и Articulate Story, позволяют создавать интерактивные курсы без необходимости в глубоких знаниях программирования.

Виртуальная и дополненная реальность: технологии VR и AR позволяют создавать захватывающие впечатления, которые погружают студентов в учебную среду. Это особенно полезно при изучении предметов, требующих практического применения знаний, таких как медицина или инженерное дело.

Мобильное приложение: Разработка приложений для смартфонов и планшетов позволяет учащимся учиться в удобное для них время, а также развитие школьной системы.

Искусственный интеллект в оценке знаний

Искусственный интеллект играет важную роль в оценке знаний учащихся и предлагает множество способов и подходов для улучшения как качества оценивания, так и опыта обучения.

Анализ данных: ИИ может собирать и анализировать данные о процессе обучения, от количества выполненных заданий до времени, затраченного на их выполнение. Это позволяет выявить слабые места в учебном процессе каждого учащегося.

Персонализированное обучение: технология адаптивного обучения с использованием искусственного интеллекта способствует созданию индивидуальных маршрутов для учащихся, предоставляя задания, соответствующие их уровню знаний и стилю обучения.

Автоматизированное оценивание: использование ИИ для автоматического анализа домашних заданий и тестов сокращает время, затрачиваемое на оценивание, и позволяет преподавателям сосредоточиться на более важных аспектах преподавания.

Система интерактивного тестирования: ИИ может создавать тесты, которые адаптируются по ходу курса, увеличивая сложность по мере успешного выполнения учащимися заданий или предоставляя дополнительные пояснения в сложных случаях.

Примеры успешного применения

Некоторые учебные заведения уже активно внедряют системы, использующие искусственный интеллект, и искусственную разведку. Например:

Образовательная платформа: Coursera и Khan Academy используют адаптивную систему, которая анализирует успеваемость студентов и предоставляет индивидуальные курсы в соответствии с их потребностями.

Виртуальные классы: Платформы, такие как Google Classroom и Microsoft Teams, объединяют инструменты для создания мультимедийного контента и тестирования, что позволяет преподавателям более эффективно взаимодействовать с учащимися.

Разработка игр для обучения: платформа игрового образования, такая как Kahoot! и Quizlet активно используют элементы геймификации для повышения вовлеченности учащихся и оценки их знаний.

Заключение

Развитие технологий и интеграция искусственного интеллекта в образование сделали создание интерактивного мультимедийного контента чрезвычайно важным для повышения эффективности обучения. Такие инструменты погружают учащихся в материал, повышают мотивацию и понимание сложных концепций.

Методы оценки, основанные на искусственном интеллекте, позволяют учащимся адаптировать процесс обучения к их индивидуальным потребностям, что позволяет им получать более целенаправленную поддержку. Однако существует также множество проблем, включая этические вопросы и необходимость подготовки преподавателей.

В целом, синергия между интерактивным контентом и методами оценки с использованием искусственного интеллекта может значительно повысить качество образования и подготовить к современным вызовам. Открытость инновациям и желание учиться – ключевые составляющие успешной образовательной среды.

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RELATIONSHIPS THAT FORM THE BASIS OF EDUCATIONAL WORK

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Abstract. Hard work, diligence, discipline, responsibility, demandingness, the ability to define a goal, the ability to choose the way to achieve it, organization, willpower, and systematically raising the level of one's profession are the most important conditions for the teaching profession. In addition to these, the teacher's humanity, compassion, tolerance, honesty, morality, fairness, patriotism, determination, objectivity, including respect for people, high morale, optimistic, demanding in communication, unity with word and deed, friendly, highly cultured to be etc. should include such human qualities. For example, if the "teacher" is not patriotic, lively, in short, a true patriot, if he does not love his country, his country, he cannot educate the person in front of him in this spirit. The great Sadi said: If there is a bad teacher, he cannot raise a happy generation. Integrity between a teacher's words and deeds is one of the requirements for his work. A teacher who stands very high in the eyes of the student becomes ordinary when he does not follow what he says. For example, a teacher calls a student to an advisory hour, an extra lesson, but does not come. Students are waiting and waiting. Next time, the reaction of the students to the teacher's call is not positive. Because they don't believe the words of the teacher. Such teachers are not recognized by the students as frivolous people and lose their reputation. Let's also note that the ordinary word used by the teacher becomes a legal issue for the student. Therefore, the teacher should think and express all his words.

Key words: *education, student, teacher, relationships, teacher personality, teacher ethics, teacher educator, educational influence, etc.*

Children who have just come to school first of all meet the teacher's sincere, smiling and kind face. The student's attitude towards training and school begins with the teacher's example. As they move from class to class, students meet the teacher's sincerity and well-structured communication. The teacher's speech, sitting, and even walking do not escape the attention of the students. The teacher gains self-respect due to positive qualities. Sometimes students choose such a teacher as their ideal and try to imitate them. Students can easily choose a good teacher from a bad one. A student never respects a teacher who can't speak, who sends the student to buy cigarettes, or calls him to help at home.

Noting that the example of the teacher has a great role in the work of education, K.D. Ushinsky shows that the influence of the educator, the teacher on the young soul is such an educational force that no textbook, no moral advice, no punishment and sympathy can replace it". Not only the teacher, the example of parents, friends, scientists, cultural figures, historical figures, including positive heroes in fiction, fairy tales and epics also has great power in education. Kindness can save our world. Kindness is not the only key to personal success. In fact, this is the factor that can change our noisy world. Big changes always start with small changes. Kindness can also start with small things. If you want your family to live in a friendly and peaceful environment, you must be kind. He who is kind is free, even if he is in prison. He who is a tyrant is a slave, even if he is a king. Kindness can do wonders. Love and kindness can change the world. Kindness means paying attention to others and identifying their needs. Kindness means valuing everyone who encounters it. We can make kindness a habit. The teacher can choose it like other virtues and develop it in himself. We must feel the responsibility of our choice. Kindness may be at odds with

today's human culture and worldview. That is, today they try to take more from you than give. They ask, what can this job do for me? We are not alone in this mortal world and man was born as a social being. In order for him to be happy, the people around him must be happy. Otherwise, his happiness will be incomplete. If a person pays attention to others and tries to see their needs and tries to make them happy, he himself will be happy (1, p.3). This feeling of kindness is such a feeling that creates a sense of peace and joy in a person's soul. If a person can make others happy in this cruel world, then he has received the blessing of kindness. But how can we be kind?

1. Let's try to praise those around us. We can see the good in others and praise and encourage them to move forward. At the same time, we can thank everyone whose work has affected us.

2. Talking with a smile. Smile when talking to a friend or colleague. At the same time, try to look him in the eye so that he believes that you are listening to him.

3. Be quick to help people. If your loved ones need help, rush to him. Try to make it easy for others to communicate with you. Make it easy for them to find you. Try so that others can trust you in this matter. No act of kindness, however small, goes to waste.

Humanism means having a humane attitude towards the student's personality and respecting his rights and freedom. In addition:

- to give appropriate and reasonable demands to the student;
- respect the student's position (even if the student does not want to fulfill the given request);
- respect the student's desire (right) to be alone;
- bring to his attention the specific goals related to the education of the student;
- not to form the required qualities by force;
- refuse physical punishment, other punishments that degrade the honor and dignity of the person;
- for one reason or another, to introduce the right to refuse the qualities that are contrary to the personality's convictions and that we want to form in it, etc. gives its demands.

The Universal Declaration of Human Rights states: "All men are born free and equal." They have reason and conscience and should have a brotherly relationship with each other." An educator should not abuse his position as a teacher, but should fight for the good future of his students together with them. Principledness - To consistently implement certain principles in word and deed, and strictly adhere to them. Criticism in education requires consistency and principle. Pedagogical-psychological studies of the last decades show that taking into account the personality characteristics and capabilities of students is more important than knowing their age and individual characteristics. Approach to personality is understood as referring to his personality qualities. These qualities express the direction of the personality, its evaluation (evaluation) tendency, life plans, formed state, other motives that prevail in its activity and behavior (2, p.5).

The principle of personality approach in education requires that the teacher:

- to regularly study and know well the individual characteristics, character traits, views, tastes, customs of his students;
- personality's way of thinking, motives, interests, psychological states, attitude to life, work, evaluation tendency, life plans, etc. to know and diagnose the level of real formation of important qualities such as;
- involve every student regularly in strengthening and increasingly difficult educational activities and ensure his development;
- detect and eliminate the reasons that prevent the achievement of the goal, if it is not possible to detect and eliminate these reasons in time, promptly change the educational tactics depending on the new circumstances;
- refer to the personal activity of the personality as much as possible;

- to combine upbringing with self-education, to help choose the goals, methods and forms of self-education;

- to develop students' independence, initiative, and self-activity, to organize and direct their activities leading to success. The complex implementation of these requirements requires the teacher to take into account the deep development of the processes, not the surface.

Age and individual characteristics take a new direction when approaching personality. Potential opportunities, near prospects are diagnosed. It is known that the primary school age creates the most favorable conditions for the formation of moral and social qualities. Therefore, it is easy to cultivate positive habits in the period of junior school age and early adolescence, accustom students to work, discipline, and behavior in society. Older teenagers become active and proactive, they set tasks for themselves in useful activities. But teachers should organize this activity and tendency to independence well. High school students are distinguished by their desire for independence. Referring to this feature, they develop high moral ideals and a sense of responsibility. It should be remembered that the potential possibilities of education of students gradually decrease, because as the child gets older, the plasticity of the nervous system decreases, and the psychological resistance to external influences increases. Individual characteristics include characteristics of perception, thinking, memory, speech, character, temperament, and will. It is extremely difficult to learn all these features in the conditions of mass education (3, p.37).

A teacher should spend extra time, energy, and resources to be successful. Caring is a term used in the sense of taking care, recording, recording. It is the duty of every teacher to show caring attitude to his students.

The role of the teacher's work in the correct formation of the students we are engaged in training and education is irreplaceable. The life path of every student who goes to school is illuminated by the teacher's knowledge like a torch. Years pass, this torch does not go out, the student grows up as a simple, humble, intelligent, honest person. As long as he lives independently and happily in life, he never forgets his teacher who brought him up, suffered a thousand hardships on this path, spared the light of his eyes and the warmth of his heart for his happiness. The teacher is proud of his former students who have won names in one or another field, and feels immense joy in his heart. He does not regret that his hair is graying, his eyes are losing light, he devotes all his energy to the education of his students sitting behind the desk, he tries to cope with his work with dignity and honesty. The students of such teachers want to be like them in life, they do all kinds of hard work to justify their trust and confidence, they study well, they fulfill their teachers' assignments properly, they are able to present themselves as disciplined students in school, family and public places, they maintain the respect of adults, and they take care of the younger ones. . All this is the priceless fruit of the work of a leading teacher. This success is directly related to the teacher-student relationship. If there is no kind, sincere and good relationship between the teacher and the student, then it is difficult for them to succeed.

Experience shows that. Heads of schools, subject teachers and classroom teachers who appreciate the importance of extracurricular and extracurricular training and direct their students' attention to this work, witness the significant development of creativity in their students. It should be taken into account that extracurricular educational institutions can organize their events in the building in which they are located, as well as in other places, including general education schools. (4, p.45)

Based on the mentioned aspects, the essence of the concept of out-of-school education can be expressed as follows: all purposeful, planned and organized activities carried out by an out-of-school educational institution in relation to the young generation, regardless of the location, are called out-of-school educational activities.

In the school itself, extracurricular training and education activities of various contents and different directions are organized. Every student can engage in creative work that matches his

interests, wishes and dreams. This is not enough, the student also learns that in addition to the educational work at the school, a wide network of extra-curricular educational institutions serving children, adolescents and young people has been established. As a student, as a citizen, this information cannot but make him feel proud. In addition, this student will become a parent, have a family, and have children tomorrow. Then, based on their information, that parent can inform their children about out-of-school educational institutions and direct them in the direction that suits their taste. Knowledge of extracurricular and co-curricular activities is more necessary for the student than in other ways. After all, she is preparing to be a classroom teacher! Acting as a classroom teacher, today's student will have to communicate with both his students and their parents much more than subject teachers and their students. Since the class teacher works with the same students throughout the year and meets with their parents, he can learn more about what each student is capable of. For this reason, it is such a class teacher who can give detailed information about extracurricular and extracurricular educational activities and extracurricular educational institutions to his students and their parents; only an informed class teacher knows the reasoned advice about which field of knowledge and ability, talent and ability of the child is more appropriate to develop. The teacher, who is an active presence in the pedagogical process, can achieve the efficiency of the educational process when he is well versed in the mechanism of creating communication (5, p.28).

In the training process, the teacher should take into account three aspects of communication: information exchange between the participants of the joint activity, correct interaction, interaction of individuals with each other, perception and understanding of each other. Types of communication can be distinguished according to the content and the way the teacher addresses the students. This includes organizational, evaluative, disciplinary pedagogical communication. To teach the students something new, that is, to instruct the individual, to be with someone, to talk, etc. can have a purpose. The content of communication is the exchange of information between the teacher and the student. This content is measured by the goal set by the teacher in the learning process. Communication should have a single goal and should be directed towards it. The effectiveness of pedagogical communication also depends on its motives. Understanding and correctness of the motive makes pedagogical communication more effective. Pedagogical communication depends on external and internal conditions. The environment and situation in which communication is established are its important conditions. For example, a student who changes his school due to his place of residence is affected by the external environment he has just entered. (6, p.39)

So, he treats the teacher whom the students admire in the same spirit. Internal conditions and are added to the external conditions as we come to the sleeping classes. A more personal, relatively stable attitude towards the teacher is formed. Over time, it becomes selective.

Special professionalism and public duties place high demands on the personality of the teacher, the face of the teacher. The requirement given to the teacher is an unconditional system of professional values that determine the success of pedagogical activity. It should be taken into account that only half of practical pedagogical activity is based on appropriate technology. The other half of it is skill, mastery. That is why the first requirement of a professional educator should be the requirement to achieve pedagogical ability. Pedagogical ability is primarily manifested in working with children, loving children, enjoying contact with them.

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ENVIRONMENTAL EDUCATION AS A PRIORITY ISSUE OF EDUCATION

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Abstract. In the article, a number of issues related to the holding of the 29th session of the Conference of the Parties to the UN Framework Convention on Climate Change - COP29, including environmental education and environmental education for the prevention of environmental risks, are put forward. It is noted that a person should understand from a young age that soil, air and water pollution can cause an environmental disaster that threatens human life. Every person should understand that the elimination of environmental pollution depends on his environmental culture, upbringing and education. It is no coincidence that many scientists consider environmental education as a systematic pedagogical activity aimed at the development of environmental culture in children.

The formation of ecological culture is the development of ecological awareness and ecological sensitivity to nature in daily communication with it in the pedagogical process. Environmental education includes a person's knowledge in the field of ecology and the formation of his moral responsibility for the protection of the natural environment.

Key words: *ecology, climate changes, environmental risks, green world, environment, healthy lifestyle, environmental education, environmental education, etc.*

The modern complex environmental situation in the world, the growing scale of anthropogenic effects on the environment have made it inevitable to solve a number of serious problems facing humanity. The ecological crisis is connected not only with the achievements of scientific and technological progress, but also with the loss of a number of values in relation to nature. In this regard, the field of education is undergoing radical changes. The formation of ecological culture, renewal of ecological education today puts the formation of a modern citizen loyal to ecological values as a serious task in front of the educational system. As it is known, the 29th session of the Conference of the Parties to the UN Framework Convention on Climate Change - COP29 will be held in our country this year. The holding of such a prestigious event in Azerbaijan is considered by the international community as a clear example of great trust in Azerbaijan, as well as appreciation of our country's contribution to environmental protection and prevention of climate change at the national, regional and global levels. Undoubtedly, hosting COP29 demonstrates Azerbaijan's determination to contribute to global efforts to tackle climate change.

In this regard, the organization of a number of environmental events in the education field of our country would be an invaluable contribution to the "Year of Solidarity for the Green World" where such a prestigious event was held.

In the Decree signed by President Ilham Aliyev on the declaration of 2024 as the "Year of Solidarity for the Green World", it was noted that Azerbaijan, as a reliable and responsible member of the international community, has contributed to the fight against the consequences of climate change. It was stated that one of the 5 national priorities for socio-economic development was defined as "Country of clean environment and green growth". In accordance with that priority, it is mentioned in the document that measures have already been started in our country in the direction of improving the environment, restoring and increasing greenery, effective use of water resources, and sustainable energy sources.

Azerbaijan has ratified the UN Framework Convention on Climate Change since 1995. On July 18, 2000, our country ratified the Kyoto Protocol, which includes obligations to reduce greenhouse gases, and on April 22, 2016, our country joined the document by participating in the signing ceremony of the Paris Agreement of the UN Framework Convention on Climate Change. By the Order of the Head of State dated February 2, 2021, Azerbaijan's National Priorities for socio-economic development until 2030 were determined. Clean environment and "green growth" country, which is one of those 5 National Priorities, has set new tasks. Taking into account the scale of global climate changes, giving a significant place to the application of environmentally friendly technologies, using clean energy sources, recycling waste and promoting the restoration of polluted areas has been defined as a decisive task. In order to achieve a high-quality ecological environment and a green energy space in Azerbaijan, concrete steps are being taken in the direction of ensuring the balance of the ecological environment with economic growth and increasing the share of green areas in the country during the last 3 years of restoring our territorial integrity. There is a great potential for the development of alternative and renewable energy sources in Azerbaijan. On May 18, 2021, President Ilham Aliyev announced that all of Karabakh will become a "green energy" zone in a meeting with public representatives in Agdam. Azerbaijan's transition to the "Green Energy" strategy is an invaluable contribution to energy security.

The logical result of Azerbaijan's environmental policy is that the 29th Conference of States Parties to the UN Framework Convention on Climate Change (COP29) will be held in Baku in 2024. As stated by President Ilham Aliyev, this is "a clear example of the great respect and trust of Azerbaijan by the international community, as well as the appreciation of our country's contribution to environmental protection and prevention of climate change at the national, regional and global levels."

The declaration of 2024 as the "Year of Solidarity for the Green World" is a first in the international arena. Undoubtedly, Azerbaijan, which constantly innovates, will duly fulfill the duties and obligations arising from this year. Within the framework of COP29, which will take place in the year of solidarity for the sake of a green world, the processes going on all over the world, including issues related to climate, other green ideas, and the green program, will be reviewed on the Azerbaijani platform and Azerbaijan's experience will be demonstrated.

As it is known, 2024 was declared the "Year of Solidarity for the Green World" in our country by the relevant decree of the President of the country Ilham Aliyev. It is noted in the decree that one of the five national priorities for socio-economic development of Azerbaijan until 2030 is defined as "Country of clean environment and green growth". In accordance with that priority, work is being done to improve the environment, restore and increase greenery, and ensure efficient use of water resources and sustainable energy sources. In addition, creation of green energy types and transportation of green energy to world markets is the priority of Azerbaijan's energy policy. Immeasurable works - "smart city", "smart village" and alternative energy projects are being carried out in the Karabakh and East Zangezur economic regions, which have been liberated from the occupation. Undoubtedly, the declaration of 2024 in Azerbaijan as "the year of solidarity for the sake of a green world" will give further impetus to our country's work in this direction.

The order in question also imposes relevant duties on the education system of our country. In accordance with the decree, it would not be bad to organize events in the following direction among students of general education institutions within the framework of the "Year of Solidarity for the Green World":

Organizing an innovative lesson on "Let's get to know the green world" among elementary school students, including taking an excursion to nature, achieving the formation of an emotional attitude to living natural objects in them;

Organization of educational events and tours on the theme "Get to know the green world" among secondary school students; here, acquaintance with the secrets of nature takes place both through academic knowledge and practical skills during expeditions and care for nature.

Events called "Let's protect the green world" can be organized among relatively high school students, and these activities have more practical significance; At this stage, students with high talent can be encouraged for nature conservation and research activities. At this time, students exchange experience, participate in various actions, scientific-practical conferences and partnership meetings.

Encouraging students to do greening in the territory of the institution where they study and organizing such events can also be considered appropriate.

The mentioned measures are aimed at the formation of students' ecological worldview, moral attitude towards nature, cognitive competence through the study of natural resources, preparation of new forms of learning and research skills, involvement in the ecological movement, ecologically oriented activities, various forms and methods of knowledge search, practical skills, organizational abilities. can stimulate their acquisition.

Later, a wide spectrum of activities based on mutual cooperation of ATM and its teacher-student staff can be defined under the name "Year of solidarity for the sake of the green world". First of all, within the framework of the "Green University" project, environmental sanitation, purposeful use of energy, waste minimization and regular transportation from campuses should be ensured in higher education institutions.

In most universities of the world, the concept of "Green university campus" (green campus) is widespread, which includes the introduction and improvement of environmental practices in the university, raising the level of eco-culture of students and employees.

A "green university" is a university whose activities are focused on protecting the environment: it reduces carbon dioxide emissions, collects waste separately, saves water and electricity, and develops ecological infrastructure. For these purposes, positive eco-actions and eco-festivals are held, a separate garbage collection system is organized, energy efficiency is increased, the territory is beautified, and educational work is carried out. These measures apply environmental principles in the university's field of activity; raising the general level of environmental culture and sense of responsibility among students and employees; the inclusion of the higher school in the international environmental ratings, the formation of the new "green" image of the university; serves the international recognition of the higher education institution by organizing environmental actions.

In this regard, within the framework of the "Year of Solidarity for the Green World", it is possible to promote the level of environmental education of students, improve environmental culture, and conduct scientific research in these areas.

First of all, we must note that the objective of the basilica should be the renewal of environmental education. The future of humanity is related to ecological culture. Solving environmental problems is one of the most important issues today.

As it is known, human influence on the environment and ecology as an anthropogenic factor has existed since ancient times. Genius Nizami Ganjavi paid special attention to nature-human relations in his works. For example, in the poem "Seven Beauties", which we mentioned, there are many ideas about the attitude to the environment. The thoughtful poet sharply criticizes the negative attitude of man towards nature:

This is a wild, predatory, monstrous person
He is not a sincere friend, stay away from him!
Every deer flees from the hunter's oppression,
People are still wild and predatory.
A gazelle can't be caught outside,

He takes refuge from people in the mountain, in the village.

Even in our modern times, these relations have not yet been fully formed. Thus, in the last two centuries, the normal harmony of the environment, its factors, natural resources, biosphere, ecosystems, flora and fauna has been completely disrupted and a very serious ecological imbalance has arisen as a result of the anthropogenic and man-made activities of man. Wars, ethnic conflicts, terrorism, space research, industrial and transport waste, toxic chemicals used in agriculture have completely destroyed the rhythm of the ecological balance by polluting the atmosphere, hydrosphere and lithosphere, bringing it to a state of collapse and agony. We would not be wrong if we say that climate change is the first in the list of the most global problems that concern humanity. According to experts on climate change, the average temperature on Earth has increased by 0.8 degrees in the last 100 years due to the influence of anthropogenic factors. The reason for the increase is gases that create a heat effect (carbon, methane gas, nitrogen oxide, etc.).

Scientific studies show that if people and states do not take necessary and effective measures to reduce gas emissions that cause natural disasters (storms, floods, hurricanes, hot winds, floods, fires, etc.), the annual average temperature of the world in the 21st century it can rise at least 3 degrees. It is not so difficult to imagine the serious consequences of this.

So what to do? After all, all this is created in the process of world development. How to regulate this process?

Everyone should just understand that the future of the world depends only on us. I think that it is possible to slow down, slow down and stop this process, for this, first of all, it is necessary to acquire ecological culture as a society and as an individual. But what is ecological culture itself? First of all, there are many approaches that differ in the ambiguity of the concept of "culture". Wikipedia reflects the essence of the definition very well: "ecological culture - a part of universal human culture, a system of social relations, social and individual moral and ethical norms, views, attitudes and values about the relationship between man and nature; harmony of coexistence of human society and natural environment; It is an inseparable mechanism of human and nature integration, carried out by the attitude of human society to the natural environment and environmental problems in general. Simply put, these are deep-rooted ideas about respect for the environment that are reflected in the thoughts and actions of every member of society. At the same time, ecological culture is the level of appreciation of the nature of people, the surrounding world and their position in the universe, a person's attitude to the world.

The ecological culture of an individual is literally a complex and long process, which means "swallowing with mother's milk", rational use of natural resources, conscious fulfillment of individual ecological rules and requirements for environmental protection. The beginning of this process should be based on education, and the next should be based on scientific knowledge and scientific creativity.

In modern times, the rapid and dynamic development of scientific and technical progress, the integration of ICT, the Internet, robots, and nano-technology into all areas of human life require the formation of a creative attitude towards nature, its resources, flora and fauna in the consciousness of society.

At present, everyone in the international world agrees with the idea that a new type of culture, civilization - ecological culture should be formed in people. Otherwise, people's negative attitude towards nature and its resources will not change, but will deepen. Today, the formation of ecological culture, civilization, thinking, consciousness, upbringing and education in people has already become the demand of the day and era. Ecological culture does not mean only certain views of nature and development of its system. It is also related to specific human activities. Increasing the level of environmental culture in society depends on the environmental education of the next generation and how they acquire environmental knowledge. This requires the

formation of a form of civilized development of culture and an educational environment that embodies human culture in all people, and at the same time, it requires all nations to prepare and implement a continuous development strategy, concept, and program of ecological education as the main direction of cultural development. In order for ecological education to be consistent and systematic, this process should be started from the first moments of personality formation, from childhood, and its foundation should be laid precisely in the family, in preschools, in primary classes, and it should be completely formed in secondary, secondary and higher schools.

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Особенности обучения на фортепиано инклюзивных студентов без музыкального образования

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Образование в области музыки является важной частью развития личности, ведь музыка способствует улучшению когнитивных, эмоциональных и социальных навыков. В последние годы все больше внимания уделяется инклюзивному обучению, которое направлено на создание условий для равного доступа к обучению для студентов с различными особенностями. Однако обучение музыке, в частности на фортепиано, студентов, не имеющих музыкального образования, представляет собой серьезную задачу. Особенно это касается инклюзивных студентов, так как они могут столкнуться с дополнительными трудностями из-за особенностей восприятия или обучаемости.

Цель данного доклада — рассмотреть особенности обучения инклюзивных студентов без музыкального образования на фортепиано, выявить методы и подходы, которые могут помочь в процессе обучения, а также проанализировать возможные трудности и способы их преодоления

Инклюзивное образование предполагает интеграцию студентов с различными потребностями в обычную образовательную среду. Это значит, что обучение должно быть адаптировано под особенности каждого ученика, будь то физические, эмоциональные или когнитивные трудности. В контексте музыкального образования инклюзия требует, чтобы педагог использовал различные методы и подходы, направленные на максимальное вовлечение всех студентов в процесс.

Студенты без музыкального образования — это люди, которые не имеют начальных знаний о музыке, нотах, ритмах или музыкальных инструментах. Для инклюзивных студентов, такие базовые концепты могут быть особенно сложными для освоения, особенно если они сталкиваются с дополнительными трудностями восприятия или обучаемости.

Проблемы и особенности обучения на фортепиано инклюзивных студентов без музыкального образования:

1.Отсутствие музыкальных навыков и знаний

Студенты без музыкального образования часто сталкиваются с трудностями на самых первых этапах обучения. Они не знают, как читать нотную запись, не имеют навыков слухового различия высоты звуков или ритма, что делает восприятие музыки затруднительным.

2. Индивидуальные особенности восприятия и моторики

Некоторые инклюзивные студенты могут иметь особые потребности в обучении, такие как аутизм, синдром дефицита внимания и гиперактивности (СДВГ), нарушения слуха или зрения, что также накладывает свои ограничения на восприятие музыки. Например, дети с СДВГ могут испытывать трудности с концентрацией внимания на длительных занятиях или с выполнением сложных движений на пианино.

3. Эмоциональные барьеры и тревожность

Инклюзивные студенты без музыкального образования могут испытывать чувство неуверенности, стеснительности или страха перед неудачами, особенно в публичных

выступлениях или перед другими студентами. Это может тормозить их прогресс и снизить мотивацию к обучению.

Подходы и методы обучения на фортепиано для студентов инклюзивного образования.

1. Дифференцированное обучение

Дифференцированный подход предполагает индивидуализацию процесса обучения в зависимости от потребностей каждого студента. Для студентов без музыкального образования важно обеспечить гибкость и адаптировать уроки, чтобы они соответствовали их уровню подготовки и способности к восприятию материала.

Методы дифференцированного обучения включают:

- Использование различных темпов обучения. Уроки должны быть адаптированы с учетом скорости восприятия информации студентом.
- Разнообразие форм подачи материала. Некоторые студенты лучше усваивают информацию визуально, другие — через практическое выполнение, третьи — через слуховые упражнения.
- Повторение и постепенное усложнение заданий. Задачи должны быть разделены на более простые этапы, которые можно успешно освоить.

2. Визуальные и тактильные методы

Для студентов, не имеющих музыкального образования, использование визуальных и тактильных методов может значительно облегчить процесс обучения:

- Цветная кодировка: Использование цветных наклеек на клавишах фортепиано, обозначающих различные ноты, помогает студентам быстрее ориентироваться в пространстве клавиш и запоминать их.
- Большие и ясные нотные листы: Нотные листы с увеличенным размером и четкими знаками облегчают восприятие для студентов, которые испытывают трудности с мелким шрифтом.
- Модели пальцев и схемы для рук: Визуальные подсказки, такие как изображения правильных позиций для рук и пальцев, могут облегчить понимание того, как правильно играть на инструменте.

3. Медленное введение в теорию музыки

Начинать обучение фортепиано нужно с основ теории музыки. Ноты и ритмы, основные понятия, такие как различие между целыми, половинными и четвертными нотами, должны быть введены постепенно. Упражнения на восприятие ритма, такие как хлопанье в такт, помогают студентам развивать чувство времени и синхронизации.

Гармония и аккорды-постепенно можно вводить основные аккорды и учить их простому исполнению. Начать можно с простых трезвучий.

4. Развитие слуховых и моторных навыков

Важной частью обучения является развитие слухового восприятия и моторики:

- Элементы слуховой тренировки:
Упражнения на распознавание высоты звуков, интервалов и аккордов помогают студентам развить музыкальный слух.
- Моторные навыки:
Регулярные упражнения для рук и пальцев, направленные на развитие координации и силы, необходимы для успешного исполнения на фортепиано.

5. Создание безопасной среды

Очень важно, чтобы инклюзивный студент чувствовал себя уверенно и безопасно. На занятиях должна царить атмосфера терпимости и поддержки, где ошибки воспринимаются как неотъемлемая часть процесса обучения. Это способствует снижению тревожности и

повышению мотивации. Преподаватель должен поощрять любые успехи, даже если они маленькие, и поддерживать студентов в моменты затруднений.

6. Интерактивные методики

Инклюзивным студентам часто помогает использование игровых элементов в обучении.

Музыкальные игры: Задания, в которых студент должен находить нужные клавиши на пианино, играть простые мелодии или следовать за ритмом.

Интерактивные приложения и программы: Использование специализированных программ для изучения нотной грамоты, слуха и исполнения может дополнить традиционные уроки.

7. Препятствия и их преодоление

Основными трудностями, с которыми могут столкнуться инклюзивные студенты на занятиях фортепиано, являются проблемы с концентрацией внимания и физическая и моторная неуклюжесть. Студенты с нарушениями могут испытывать трудности с длительными занятиями. В таких случаях необходимо разбивать уроки на короткие блоки, использовать элементы геймификации, поощрять активное участие. Некоторые студенты могут не обладать развитыми моторными навыками для точного и координированного выполнения движений на пианино. Для них подходят специальные упражнения на развитие моторики и координации.

В заключении, обучение инклюзивных студентов без музыкального образования на фортепиано требует терпения, индивидуального подхода и применения разнообразных методов обучения. Важно учитывать не только образовательные потребности студентов, но и их психологические и эмоциональные особенности. Применение дифференцированного подхода, использование визуальных и тактильных средств, постепенное введение теории и развитие слуховых и моторных навыков поможет создать эффективную образовательную среду, способствующую успешному освоению фортепиано.

Teaching the topic "Bionics" with 5E

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Effective planning ensures that the lesson is structured, involving and meaningful. Establishment of lessons with the 5E's promotes active participation, stimulates thinking and problem solving. Let's consider planning the topic of bionics. In the daily planning of the lesson, the teacher mainly focuses on which sub-standard to implement firstly in this lesson. Then defines the learning objectives pursuant to the standard. The course of the whole lesson, the educational strategies are based on standard and non-standard objectives. The aim of the lesson:

- Explains the role of bionics science achievements in our life.
- Prepares presentations on the achievements of bionics via modern equipment.

After the aim is specified, integration opportunities, working form and method, resources to be used in the lesson are determined. Interdisciplinary integration may be conducted with computer science. Vertical intra-disciplinary integration is carried out with lower-class subjects. The learning form is appropriate for group and collective and applying brainstorm, discussion, and presentation methods. A3 sheets, colored markers, pictures, projector are used as resources. The subject is taught in the sequence pursuant to the stages of the 5E model. The 5E model consists of the stages of "Interest", "Research", "Explanation", "Reinforcement" and "Evaluation". In the first stage of the lesson, students are asked questions using a familiar situation and involved to discuss. The aim is to establish a connection between students' initial knowledge and the learning conclusions of the lesson, to arouse interest in the topic and direct to research.

- Most of the devices and machines created by people over the years are based on the structure or features of plants and animals. What knowledge do you think helped inventors create such devices? In the meantime, the demonstration of the electronic presentation would be very interesting. For example, by showing pictures of birds, mollusks, jellyfish, fish, dandelions, and bats, "Which devices and machines do you liken to these creatures?" Why? For what features?" questions are asked.

At the second stage, the inquiry stage, students participate in activities, discuss the conclusions, and are prepared to move from specific conclusions to a more general understanding. The tasks in the "Activity" part of the textbook are implemented. For the explanation stage to be effective, the teacher synthesizes and summarizes what the students have learned at the second stage before directly presenting the information pursuant to the 5E lesson model. At this stage, videos, computer programs or other aids from various resources are used. Explained: Bionics science and its achievements; computer and human brain; jet motion of a rocket. The questions, problems or tasks presented at the reinforcement stage aim at strengthening and deepening the knowledge learned by the students. Students are divided into groups by the Number method. Worksheets with tasks related to the topic are presented. Evaluation criteria and time will be stated.

Task:

- Comment on bionics and its achievements.
- Make a presentation on devices referring to living things.

A general conversation opportunity may be created through the think, discuss, share strategy.

- Why is the research of bionics necessary not only for technology, but also for biology?

At the fifth Evaluation stage, the teacher may observe the students and check that they understand completely the main concepts. During the evaluation, the teacher draws up criteria pursuant to the aim of the lesson. Evaluation criteria: interpretation, presentation preparation. When working in a group, the task is carried out completely and accurately, pursuant to the criteria

of collaboration, listening, design and presentation. Self-evaluation sheets may also be provided to encourage students to evaluate their own learning.

To carry out reflection, it is enough to ask a few questions helping you to follow the steps of the learning process.

- What surprised you today?
- What helped you solve the problem set?

Home assignment: Research and report on the achievements of bionics.

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Objective and Success-Stimulating Assessment of Students' Knowledge Quality

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President K. Tokayev, at a meeting on the socio-economic development of the country held on April 19, 2023, highlighted certain problems in the field of education. Noting the low quality of knowledge among school students, he remarked that the country focuses not on quality but on high performance indicators. "There is a discrepancy between the grades students receive on the Unified National Testing (UNT) and their school grades; the difference between these grades can be 30% or more," said the head of state. Indeed, analysis shows that annually, on average, 25–30% of school graduates do not overcome the threshold level of the UNT, which corresponds to the lowest quality level—"recognition." Such a discrepancy indicates that schools have a "percentomania," stemming from an unobjective assessment of the quality of students' knowledge. As is known, percentomania is the pursuit of high (percentage-wise) quantitative indicators at the expense of work quality. Considering this negative phenomenon, the president instructed the government to solve the problem of objectively assessing the knowledge acquired by students in school.

Renowned educators [1,2,3,4], as well as we in our own research [5,6], have shown that the root cause of unobjective student assessment lies in the absence of a diagnostic method of goal-setting in schools. The goal of education must be set diagnostically—that is, so precisely and definitively that one can unequivocally conclude the degree of its realization and achievement [1,2,5,6]. A diagnostic formulation of the educational goal is characterized by learning outcomes expressed in students' actions, which can be precisely recognized, evaluated, and measured [1,5,6,7].

From the phrase "learning outcomes expressed in students' actions," inherent in the definition of diagnostic goal-setting, the following ensues:

- a) Education should be organized based on students' independent cognitive activity;
- b) Learning outcomes form a hierarchically dependent structure, as students' activities are characterized by a hierarchy of reproductive, transformative, and productive actions [5,6].

Based on this hierarchy of activities, scientists have defined corresponding hierarchies of learning outcomes. For example, Academician V. P. Bepalko identified the following levels (hierarchies) of mastering educational material: student level, algorithmic level, heuristic level, and creative level of mastery [1].

The most well-known system of goals built on diagnostic goal-setting methodology is the taxonomy of educational objectives by American scholar B. Bloom. Bloom's system of goals includes the following components, hierarchically dependent on each other: knowledge → comprehension → application → analysis → synthesis → evaluation [4,6,7].

Thus, B. Bloom substantiated a hierarchically arranged structure of educational goals (Bloom's taxonomy)—that is, a vertical hierarchy of one of the elements of a holistic methodological system of education. It should be noted that Bloom's taxonomy, developed in the mid-20th century, played a progressive role in the development of learning theory and didactics as a whole. Globally, Bloom's taxonomy serves as the basis for planning education and objectively assessing students' academic achievements. Abroad, based on Bloom's conceptual ideas, the "theory of mastery learning" and instructional technology implementing this theory, oriented toward results, were developed.

As is known [2], a goal is an extremely specific, qualitatively characterized image of a desired (expected) result that a student can achieve at a strictly defined moment in time. Diagnostic goal-setting in education implies that when formulating it, there is always a mechanism (method) allowing one to verify the correspondence of the result to the set goal. The correlation between goal and result determines the quality of education. Hence, the goal and result should be presented, measured, characterized, and described in the same units and parameters [2].

Thus, to objectively assess the quality of education, we must first diagnostically define educational goals, which, in turn, characterize the expected learning outcomes.

Due to the absence of diagnostic goal-setting methodology in knowledge-centric didactics, the concept of "quality of education" was interpreted incorrectly. Under "quality of knowledge," it was understood as "the percentage ratio of the number of students who received '4' and '5' to the total number of children in the class." The percentage ratio of the total number of students to those who received unsatisfactory grades determined the "achievement rate" of the class. In this context, students often received '4' and '5' for correctly repeating and memorizing the studied material. Receiving good grades depended on the teacher's mood and subjective attitude toward a particular student. Often, grades became a means of punishing children for disobedience, excessive activity, and so on.

These negative factors were a consequence of the underdevelopment of pedagogical qualimetry in knowledge-centric didactics, the absence of diagnostic goal-setting, and clear assessment criteria. To be fair, it can be noted that normative documents of that time also presented "assessment criteria," which determined for what and how many points should be given in the form of grades on a 5-point scale. For example, in a pedagogy textbook [8], high marks '4' and '5', serving as the basis for determining the "quality of knowledge" of students in knowledge-based pedagogy, are described as follows: "The highest grade '5' (excellent) is given for deep and complete mastery by the student of the content of the educational program, the ability to highlight the theoretical and factual in the educational material, the ability to independently construct a response, explain the stated definitions and concepts, as well as the correct style and literary form of the answer." "Grade '4' (good) is also given for deep and complete assimilation of the content, for the ability to correctly state and prove the studied concepts, rules, definitions, positions. However, the student allows inaccuracies and individual errors in content, form, and style of the answer" [8].

In these assessment descriptions, there is a lack of clarity. For example, the expression "deep and complete mastery by the student of the content of the educational program" requires a detailed explanation of what constitutes "depth" and "completeness" in mastering textbook content. There is also no requirement regarding the development of students' abilities to apply the learned content in various situations. These descriptions are permeated with the main concept of the knowledge-centric approach—to master the content of educational material. In these assessment criteria of knowledge-centric didactics, the degree of content mastery is not linked to Bloom's taxonomy of educational objectives—that is, to their diagnostic formulation and scientifically substantiated descriptions of classifications of knowledge qualities. Moreover, they are not expressed in students' actions characterized by their dynamic cognitive activity

(reproductive, transformative, productive (creative)), which can be precisely identified, measured, and evaluated. Such vagueness in assessment standards led to arbitrariness both in grades and in reports on the state of students' knowledge quality, and consequently, to the notorious "percentomania" in schools.

As part of the implementation of the "Updated Content" project, the Ministry of Education and Science of the Republic of Kazakhstan declared the introduction of a criterion-based assessment system and the practical implementation of diagnostic goal-setting methodology. The expected results of the State Compulsory Educational Standard (SCES) were determined based on Bloom's taxonomy.

The definition of the concept of "quality of education" acquired a new meaning in accordance with global experience requirements. A 10-point assessment system was introduced. All these progressive changes became a decisive step in the transformation of pedagogical qualimetry in the education sector of the Republic of Kazakhstan [9].

Analysis shows that multi-point grading scales have been implemented in most countries worldwide and serve as a means of objectively assessing students' academic achievements [10].

Indeed, the 5-point system does not allow for precise and objective assessment of a student's knowledge; hence, teachers resorted to using grades that do not officially exist, like "3–", "3+", "4–", "4+", and so on. Moreover, as noted above, grades were assigned based on the teacher's subjective decision. The low degree of objectivity in the assessment procedure and the narrow range of marks led to poor grades negatively affecting a student's self-esteem and becoming the cause of serious psychological trauma for students.

The 10-point assessment system implies a flexible approach to evaluating students' knowledge, as the expanded range of marks allows for a more precise assessment of students' knowledge and skills. Consequently, the 10-point system allows children to feel more comfortable. It facilitates establishing more humane and ethical relationships among all participants in the educational process, including parents. The normative document states that the academic achievements of students in grades 2–11 will be assessed daily, while first graders will not receive grades. It is also specified that the 10-point grading can be correlated with the 5-point scale, where 1–3 are equivalent to a "2," 4, 5, 6 to a "3," 7, 8 to a "4," and the highest marks 9 and 10 to a "5."

The normative document states that the updated (10-point) assessment system in Kazakhstan implies formative assessment of students' knowledge across five degrees of material mastery:

1. **First Degree:** Manifested in recognizing a new object, understanding meanings, and the ability to identify differences and similarities between studied topics.
2. **Second Degree:** Characterized by actions of reproducing the material from memory; however, reproduction is often unconscious.
3. **Third Degree:** Involves understanding the studied material and its conscious reproduction.
4. **Fourth Degree:** Manifested in applying the acquired knowledge to solve educational tasks using examples and models.
5. **Fifth Degree:** The final stage, showing that the student understands the material and can apply the acquired knowledge in unfamiliar situations [9].

These degrees of material mastery characterize the expected results; however, it is not difficult to notice that they do not fully correspond to the expected results presented in the SCES and established based on Bloom's taxonomy. Moreover, in the specified five degrees of material mastery, the characteristics are not described in students' actions that can be precisely identified, measured, and evaluated. In a multi-point system, each point should characterize the degree of conformity of the students' actually achieved results, based on exploratory-cognitive activity, to

the planned educational objectives (expected results). The degree of conformity can have three levels: low, medium, and high.

The normative document states that the assessment system in Kazakhstani schools has an integral scale for assessing students' knowledge, where each point determines the level of students' activity, their understanding of the subject, the quality of completed tasks, and a creative approach to solving assigned problems. However, the document lacks a section describing how the degrees of material mastery correspond to the levels of knowledge quality among students. In the five degrees of mastery, there is also no mention of a creative approach to solving tasks. The final degree—applying acquired knowledge in an unfamiliar situation—can serve as a basis for a creative approach but does not demonstrate the creative level of mastering educational material.

It is also stated that the 10-point assessment system allows students to independently choose assignments for self-study according to difficulty levels, which stimulates their educational and cognitive activity. However, in practice, level-based content that allows achieving all educational goals across the entire taxonomy range was not developed. Our experience has shown that these level-based assignments for independent work do indeed facilitate developmental learning; however, the level of difficulty should not be chosen by the students. The necessity of obtaining solid foundational knowledge, serving as the basis for forming skills to apply the acquired knowledge in practice, requires students to progress through all degrees of difficulty in level-based tasks—from simple to more complex. Such activity-based developmental learning, allowing the achievement of the entire range of educational objectives and having a hierarchical content structure, we have called **three-dimensional educational content** [5,6]. It is well known that conducting formative and summative assessments requires the development of collections of level-based control assignments for all subjects [4,5,6].

However, the Center for Pedagogical Measurements (CPM) of Nazarbayev Intellectual Schools (NIS) did not create level-based control and measurement materials for the subjects.

"The diagnostic definition of educational objectives and the development of materials for objective control over the quality of students' knowledge is the main task in overcoming formalism and percentomania in schools," asserts Academician V. P. Bespalko [1]. Moreover, he reasonably argues that, with a focus on diagnostically set educational objectives, content selection should be carried out in all academic subjects of the curriculum.

These assertions by V. P. Bespalko and our conclusions—that the content of developmental education, based on an activity-competence approach, has a hierarchical structure and should correspond to the requirements of the taxonomy of objectives—are also confirmed by the findings of the English educational scientist Geoff Petty [4]. Geoff Petty rightly believes that Bloom's taxonomy has many applications [4]: "The six main stages of the taxonomy can be considered as a hierarchy of skills and abilities. These stages can also be viewed as levels of assignments offered to students." "The word 'assignment' is used here in a broad sense—it can be a teacher's question, an exercise, problems, a project, etc. Since teaching at the levels of 'knowledge' and 'comprehension' leads to superficial learning, to develop students' functional literacy, teachers should offer assignments that require high-level thinking—at the levels of 'application,' 'analysis,' 'synthesis,' and 'evaluation,'" asserts Geoff Petty [4].

Our research has shown that level-based content—assignments—provides increasingly deepening student activity along the ladder of the taxonomy of educational objectives, including the qualities of knowledge of the corresponding level. Therefore, in advanced countries, when designing the educational process, the "backward design" approach is widely used, where the main criterion is not the content but the planned results defined in educational standards and curricula [4].

Having declared the introduction of a criterion-based assessment system along with a multi-point grading scale into practice, the Ministry of Education and Science of the Republic of Kazakhstan (MES RK) was unable to implement it effectively. According to OECD data (2014), assessment based on criteria will make education more equitable, as it makes the assessment process as objective as possible. In global practice, the following definition is given for the objective assessment of students' academic achievements: **Objective assessment is the evaluation of students' academic achievements in accordance with pre-known assessment criteria, allowing for the adjustment of individual development trajectories to achieve expected results in accordance with educational objectives.** Consequently, the criterion-based assessment system is a means of transitioning from a subjective assessment system to an objective one. The main task of criterion-based assessment is the objective evaluation of students' academic success, where the result of the student's activity is compared with a pre-defined and known criterion. Thus, criterion-based assessment is the process of correlating the actually achieved learning outcomes by students with the expected learning outcomes based on developed criteria [10]. An **assessment criterion** is a characteristic on the basis of which the evaluation of students' academic achievements is conducted [10]. From this, it is clear that a criterion of a certain level describes the quality of students' knowledge corresponding to that level. In the normative document [9], the following levels of mastery are indicated as criteria for assessing students' academic achievements: **knowledge, comprehension, application, analysis, synthesis, evaluation.**

The degree of correspondence between the set goals and the results actually achieved by students determines the number of assessment points. Therefore, based on the possible three options for degrees of correspondence (low, medium, and high levels of correspondence), V. P. Bespalko proposes a 12-point assessment system, where the criteria are descriptions of four levels of mastery. The objective necessity of a multi-point system stems from the number of educational objectives (according to B. Bloom—6; according to his modification and V. P. Bespalko—4 educational objectives) multiplied by 3, i.e., by three options for the degree of their correspondence to the obtained (expected) result.

The criteria for assessing students' academic achievements can be the characteristics (descriptions) of educational objectives according to Bloom's taxonomy, as well as characteristics of the levels of mastery (taxonomy) by V. P. Bespalko and the classification of levels of knowledge quality by Yu. K. Babansky [3,5,6].

Having declared in the "Updated Content" project the intention to introduce a criterion-based assessment system of students' academic achievements, the AEO "Nazarbayev Intellectual Schools" (NIS) was unable to fully organize the implementation of this innovation in pedagogical qualimetry in practice. Firstly, because the interconnection of the criterion-based assessment system with the hierarchy of knowledge quality—showing the degree of correspondence of students' levels of mastery to diagnostically set goals, which can be precisely identified and measured—was not substantiated. Secondly, level-based control and measurement materials (CMM) for formative and summative assessments in subjects across grades were not developed. In work [11], AEO NIS states the need to develop level-based measurement materials for summative assessment; however, collections of control and measurement tasks for all subjects corresponding to diagnostically set educational objectives were not compiled.

In the MES RK norms for assessing students' knowledge, the concepts of "quality of knowledge" and "quality of education" are absent. In work [6], we have presented definitions of these concepts and revealed their essence. From the definition of criterion-based assessment, it is clear that it determines the quality of students' knowledge by levels of mastery, allowing for objective evaluation. In work [6], we have shown that the six objectives in Bloom's taxonomy can be transformed into four objectives, which corresponds to V. P. Bespalko's assertions about four levels of mastery and the need to modify Bloom's taxonomy by his followers. By integrating the

objective concepts of "analysis," "synthesis," and "evaluation," the resulting integral objective can be equated with judgment and generalization of the learned material, determining the result of creative activity, which is a prototype of the productive objective "creation." Bloom's followers also propose completing the taxonomy of objectives with "creation." The best global experience shows that innovative trends in the development of modern education, such as digitalization and STEM approaches, imply the "creation" of original products based on students' creative activity [12,13]. Thus, the modified Bloom's taxonomy of educational objectives includes the following four levels: **knowledge, comprehension, application, creation**. The didactic matrix we developed visually demonstrates the design of the educational process with a modified control and assessment part, which is intended for the application of a criterion-based assessment system [5,6].

In the five degrees of material mastery approved in the MES RK norms, the level of mastery corresponding to the educational objective "creation" is absent. Note that without this level of mastery, it is impossible to form engineering and technological skills in students, which are required by digitalization and STEM approaches. As is known, these approaches transform the education system in the context of the requirements of the Fourth Industrial Revolution [12,13].

At the same time, it should be noted that when studying educational material, the goal of "creation" is not always set, which requires solving educational-research tasks, project research, assignments with integrated content of an applied nature, solid foundational knowledge, subject-specific and cross-curricular competencies. In such cases, a grade of "5" is given for achieving the goal of "application," where the application of acquired knowledge is used in an unfamiliar situation. As is known, "creation" requires a non-standard creative approach to applying the acquired knowledge, where the highest score is awarded for successful defense of project work, proven results of educational-research activities, as well as for innovation and invention of new original products (for example, creating an original robot).

Global experience shows that the implementation of a diagnostic method of goal-setting, a criterion-based multi-point assessment system, as well as the development of corresponding level-based content and control and measurement materials (CMMs), are sufficiently complete necessary conditions for the practical use of a new objective method of assessing students' academic achievements. However, for motivating towards developmental learning and organizing the in-depth progression of students through level-based content, these conditions are insufficient [4,5,6,14,15]. For this, it is necessary to change the existing philosophy of assessment, moving from assessing for mistakes made to assessing as encouragement for success.

The humanistic paradigm of education and the health-preserving approach to learning pose a task for 21st-century didactics to radically restructure the conceptual foundations of pedagogical qualimetry. Humanization requires that in the new school model, there should be no formal control or "percentomania" in assessment. Assessment should have a pronounced educational and developmental orientation, connected with self-control, self-assessment, and self-correction. In the traditional school, the assessment of a student's activity is oriented toward the maximum level of mastering educational material. However, such an assessment system is quite rigid for those who fall below the maximum level according to their abilities. In such a traditional method of assessment, called the "subtraction" method, the starting point is the maximum grade "5," from which the student's grade is lowered depending on shortcomings and errors made. In this case, the grade serves as a means of punishment rather than encouragement and does not reflect the true level of the learner's achievements. As a result of such an approach to assessing students' activities, their motivation to learn decreases, and a "fear of failure" syndrome forms, characterized by the fear of being punished for an incorrect answer. In a traditional lesson, the teacher usually manages to question one or several students, during which other students may consider themselves free, not showing activity or initiative.

The pedagogical technology of the Three-Dimensional Methodological System of Instruction (TDMSI) developed by us involves the use of a new concept of assessment, allowing not only criterion-based (objective) evaluation of students' academic achievements but also contributing to the introduction of a stimulating method of assessment into practice. The new assessment methodology provides for a transition from the principle of "assessment as punishment for a mistake" to the principle of "assessment as a stimulus for success." Assessment by the "subtraction" method shifts to assessment by the "addition" method [5,6].

Thus, under the conditions of applying the pedagogical technology based on the three-dimensional methodological system of instruction, assessment is carried out by the "addition" method, which is based on the minimal level of general educational preparation. Achieving this level is required from each student as mandatory. Criteria for grades of higher levels of personal preparation are formed through their substantive increment in the depth of mastery based on the minimal level. Assessment of students' activities by the "addition" method returns to school the motivation for academic success, guaranteed support based on the achieved basic level of preparation. Changing the approach to control in this case naturally entails the expediency of changing the assessment system. The transition from the "subtraction" assessment method to the "addition" method is carried out by introducing the measurement unit "credit" [5,6].

Our experience shows that thanks to the "credit," underachieving students ensure overcoming the student level, i.e., the "knowledge" level. As a rule, having first overcome the mandatory level, they strive further; they develop motivation to learn and self-confidence [4,5,6,14,15].

Such objective and success-stimulating assessment creates a favorable, comfortable educational environment. Thus, the most stressful part of the educational process—the control and assessment stage—acquires the form of ceremonial encouragement, rewarding for successful work. The negative consequences of the traditional assessment process—"fear of failure," "overachiever syndrome"—disappear. With such a constructive model of learning, students, unafraid of the consequences, engage in discussions, openly expressing their opinions.

Thus, the introduction of a new concept of assessment allows for the elimination of stressful situations arising from the lack of objectivity in assessment and the essence of traditional assessment based on punishment for students' mistakes during learning. A transparent, objective, and understandable assessment policy for everyone (students, teachers, parents) contributes to the triumph of justice and creates a comfortable educational environment.

Experience has shown that TDMSI contributes not only to the introduction into practice of objective and success-stimulating assessment of students' knowledge quality and the successful use of three-dimensional developmental educational content and diagnostic goal-setting methodology but also to organizing learning that guarantees the achievement by all students of the necessary mandatory level of State Educational Standards requirements.

When applying this technology, the goals of the first and second levels (knowledge, comprehension) are realized at 100%, ensuring a dynamic growth of indicators at the levels of "application" and "creation" [5,6]. Such effectiveness is guaranteed by the strict sequence of complicating level-based tasks (knowledge, comprehension, application, creation), high internal motivation, and student activity, the formation of which, along with active methods, is facilitated by the use of a stimulating method of assessment.

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Protection of children's rights during differentiated education and remediation

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Key words: differentiation, teaching, remediation, rights, , opportunity, motivation, lesson

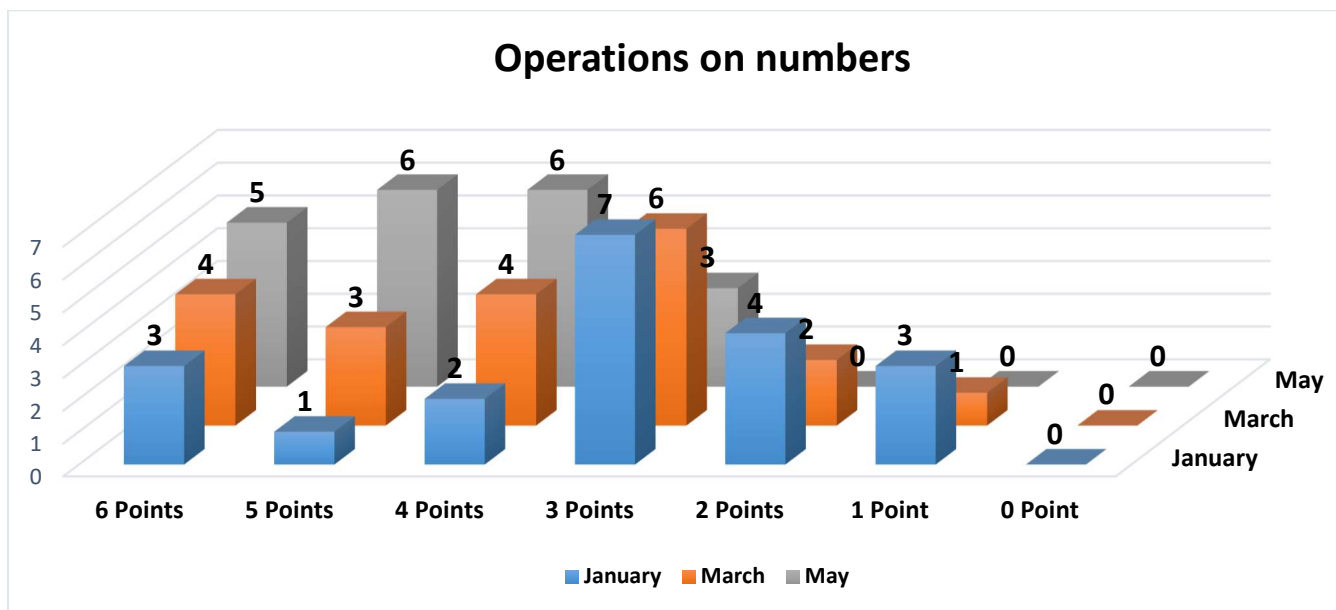
During differentiated teaching, the educational process is adjusted to the interests and needs of students, that is, students with different achievements in the same class learn differently. Each right outlined in the Convention on the Rights of the Child applies to all children with no discriminatory exceptions. The goal of differentiated instruction is for each student to achieve the best results within his or her abilities, so it does not aim to achieve equal results despite differences.

In all countries of the world, the rights of the child are strengthened by international or local legislative acts, administrative legislation and their enforcement. It is differentiated teaching that allows the teacher to overcome barriers and improve the results he/she achieves through continuous formative assessment and flexible grouping while respecting the rights of the child. Assessment is formative if we analyze the results and adapt them to the needs of the students. Interventions planned and implemented with students enable them to overcome existing problems and improve their knowledge level.

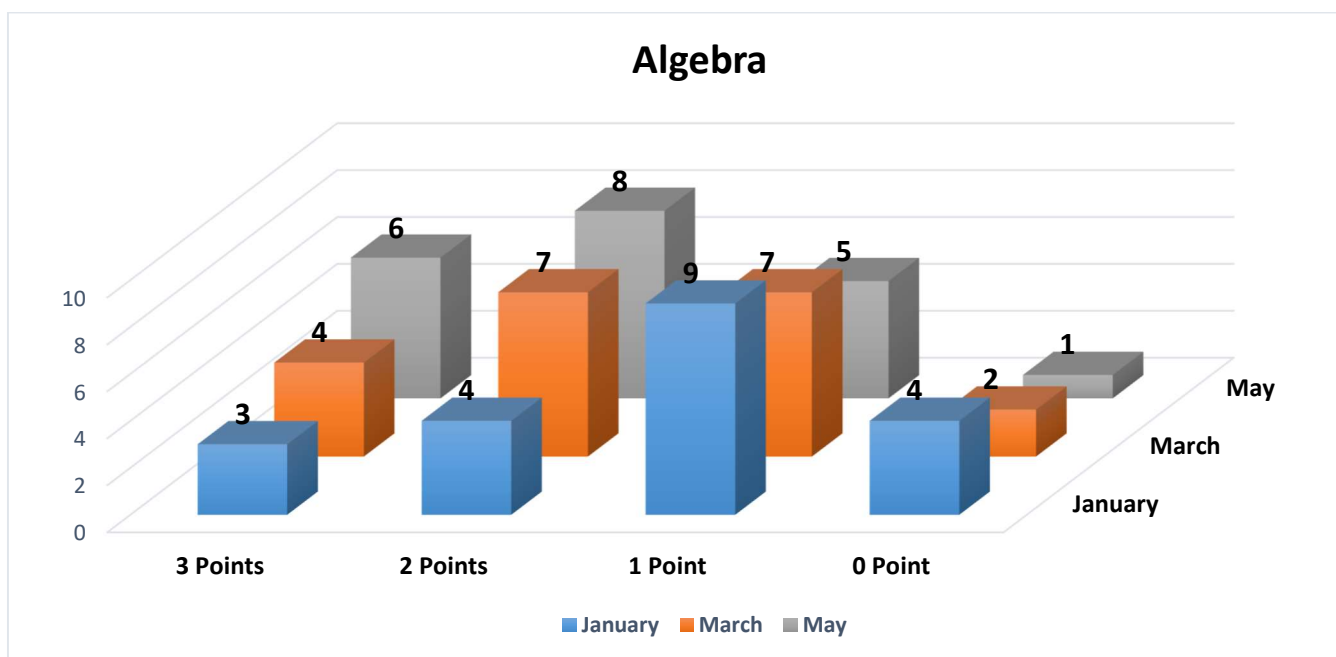
An intervention study with formative assessment, differentiated approach and remediation was conducted in mathematics with 2nd grade students of one of the public schools in Kutaisi, Georgia. The study was carried out in three phases: the first phase at the end of January, the second at the end of March to understand how well the interventions were selected, and the third phase at the end of May. Quantitative research was chosen as the research method.

A 24-point diagnostic test of varying difficulty was used during the research. The tests were divided according to the following criteria: counting, number recognition, comparing numbers, operations on numbers, regularity, algebra, data analysis and geometric figures. Diagnostics confirmed our findings that there were both high and low readiness students in the class. Based on these results, we planned various interventions tailored to the needs of the students. A repeat assessment showed that the interventions worked, with students' performance increasing significantly compared to the first test. Let's see how the data was according to several criteria:

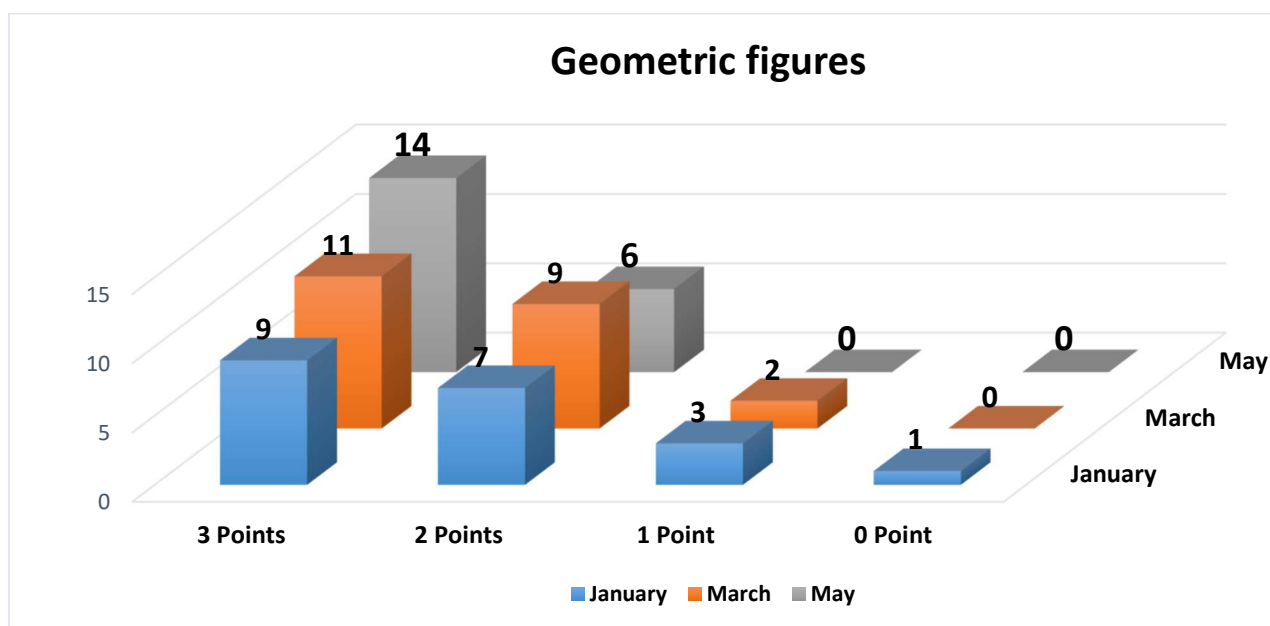
Actions on numbers: the maximum grade was 6, in the month of January 6 points were scored by 3 students, 5 points by one student, 4 points by 2 students, 3 points by 7 students, 2 points by 4 students, 1 point 3 students, none of them got 0 point. During the process of intervention work, the results at the end of March were as follows: 4 students scored 6 points, 3 students scored 5 points, 4 students scored 4 points, 6 students scored 3 points, 3 students scored 2 points. , 1 point by 1 student, 0 point by none. The results have improved, so we started quite intensive interventional work. The evaluation conducted in the month of May gave us the following results: 6 points for 5 students, 5 points for 6 students, 4 points for 6 students, 3 points for 3 students, and none of them received 2 points, 1 point and 0 point. .



Algebra: the maximum grade in this part was 3 points, in January 3 students earned 3 points, 4 students got 2 points, 9 students got 1 point, 4 students got 0 points. During the process of intervention work, the results at the end of March were as follows: 3 points earned by 4 students, 2 points by 7 students, 1 point by 7 students, 0 point by 2 students. The results have improved, so we started quite intensive interventional work. The assessment conducted in May gave us the following results: 6 students earned 3 points, 8 students got 2 points, 5 students got 1 point, 1 student got 0 points.



Geometric figures: the maximum score in this part was 3, in the month of January 9 students got 3 points, 7 students got 2 points, 3 students got 1 point, one student got 0 point. During the process of intervention work, the results at the end of March were as follows: 11 students earned 3 points, 9 students earned 2 points, 2 students earned 1 point, no one earned 0 point. The results have improved, so we started quite intensive interventional work. The evaluation conducted in the month of May gave us the following results: 14 students earned 3 points, 6 students earned 2 points, 1 point and no one earned 0 point.



The effective use of differentiated instruction depends entirely on how well the teacher knows his students and how well he takes into account the knowledge, skills, attitudes and unique experiences of each of them, which are formed by daily interactions with parents, peers, and the world in general. This will work very well when performing a complex task. At this time, we have a full opportunity to differentiate the product - taking into account the student's ability, need, knowledge level and desire. In the process of fulfilling short-term goals, the teacher can freely use group, pair and individual work. Here we can use not only a differentiated approach, but also a remedial program if necessary. At this time, the teacher provides customized activities that increase self-esteem, increase engagement and motivation. The student is involved in the educational process with full protection of his rights.

It is important to continuously monitor the progress of students. It focuses on the teacher's observation of the student's development and improvement of results, and on the other hand, the student's involvement in the process of observing his own progress. The next activities of the program should be planned with this in mind. In addition, students should constantly have the opportunity to receive constructive feedback from the teacher, in particular, they should clearly explain what results they have achieved and what they need to correct.

Comparing the conducted studies, we can conclude that:

- The quality of students' academic performance improved, which was our goal;
- Students have more motivation to study.

The tasks offered to the students were varied and appropriate to their cognitive levels. By protecting the rights of the students, the approaches planned according to their needs helped the students to master the learning material better.

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Биология сабағында STEM білім беру бағдарламасын жобалау әдістемесінде қолдану

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Зерттеудің мақсаты – STEM білім беру арқылы биология сабағында оқудың мәні мен мазмұнын талдау және білім берудің негізгі проблемалары мен қайшылықтарын анықтау және оны дамытудың негізгі тәсілдерін анықтау.

Қойылған міндеттерді шешу үшін зерттеу пәніне және қойылған мақсатқа сәйкес келетін теориялық әдістер кешені пайдаланылды.

Зерттеудің теориялық және әдістемелік негізі жүйелік, құзыреттілік және тұлғалық-белсенділік тәсілдер болды [1]. STEM білім беруді жүзеге асырудағы бірқатар маңызды мәселелер мен қарама-қайшылықтар көрсетілген: дәстүрлі білім беру жүйесі 21 ғасырдағы жұмыс күшін тәрбиелеу мен оқытудың талаптарына толық жауап бермейді; STEM технологиясы (Science, Technology, Engineering, Mathematics) білім беру процесінде, әсіресе Биотехнология саласында танымал бола бастады. STEM технологиясын қолдана отырып, білім алушылардың зерттеу құзыреттіліктерін қалыптастыру олардың болашақ кәсіби жетістіктерінде шешуші рөл атқарады. STEM білім беру бағдарламасын қолдану студенттерге сыни ойлауды, аналитикалық дағдыларды, командада жұмыс істеу және күрделі мәселелерді шешуге көмектеседі [2]. Олар шығармашылық, бастамашыл және тәуелсіз болуды үйренеді, бұл табысты ғалымның негізгі қасиеттері. Осылайша, STEM білім беру бағдарламасы арқылы білім алушылардың зерттеу құзыреттіліктерін қалыптастыру олардың кәсіби өсуіне және осы саладағы болашақ мансапқа дайындалуына ықпал етеді. Олар тек білім ғана емес, сонымен қатар өз білімдерін іс жүзінде сәтті қолдануға және биотехнология саласындағы мамандардың сұранысына ие болуға көмектесетін дағдыларды алады.

Бүгінгі күннің білім беру жүйесінде STEM (Science, Technology, Engineering, Mathematics) пәндеріне көп назар аударылуда. Бұл бағыт оқушыларды ғылыми ойлауға, технологиялық шешімдер қабылдауға, инженерлік жобаларды іске асыруға және математикалық әдістерді қолдануға бағытталған. Биология сабағында STEM жобалау технологиясын қолдану білім алушылардың пәнге деген қызығушылығын арттырып қана қоймай, олардың практикалық дағдыларын жетілдіруге мүмкіндік береді.

Қазіргі уақытта әлемнің жетекші елдері STEM білім беру саласындағы кемшіліктерді шешу жолдарын ұсынатын орта және жоғары кәсіптік білім беру үшін әртүрлі мамандандырылған бағдарламаларды қамтитын білім беру стратегияларын әзірледі. Австралия, Англия, Шотландия және АҚШ сияқты елдер STEM реформасын жүзеге асыру бойынша ұсыныстарды қамтитын ұлттық баяндамаларды жариялады[3]. Австралия, Қытай, Англия, Корея, Тайвань және Америка Құрама Штаттары интеграциялық, пәнаралық тәсілдер жиынтығы білім беру бағдарламаларында студенттердің STEM білім беру олардың кәсіптегі мансабына қалай әсер ететінін түсінуіне көп көңіл бөлінеді. Францияда, Жапонияда, Оңтүстік Африкада жалпы білім беру бағдарламасында мектептен тыс кәсіптік ұйымдар мектеп оқушыларының назарын STEM кәсіптеріне аударатын және әртүрлі мамандықтарға оқытуға мүмкіндік беретін STEM білім берудің бейресми бағдарламаларын (мысалы, жазғы

лагерьлер, мектептен тыс іс-шаралар, жарыстар және т.б.) әзірлеуде. STEM білім беру бағыттары айта кету керек, тек арнайы дайындықтан өткен мұғалімдер немесе қосымша кәсіптік оқудан өткен және жаратылыстану пәндері мен технологияларының бірыңғай жүйесінде жұмыс істеуге дайындық барысында бұл мәселені шешу үшін АҚШ-та, мысалы, алдағы 10 жылда STEM білім беру саласында 100 мыңнан астам мұғалімді дайындау үшін 62 PEDAGOGICS SCIENCES ұлттық бағдарламасы қабылданды. Ресей Федерациясының қазіргі білім беру жүйесінде мұғалімдердің айқын тар мамандануын атап өтуге болады, нәтижесінде мектеп түлектерінің білімі негізінен үзінді болып табылады[4]. Қазіргі заманның сын-қатерлеріне жауап ретінде Ресей Федерациясы да STEM білім беруді дамыту бағытында жұмыс істеп жатқанын айта кеткен жөн. Intel корпорациясының STEM орталықтарының жобасы бар - бірақ бұл жоба тек жоғары сынып оқушыларының инженерлік, техникалық және өнертапқыштық әлеуетін дамытуға бағытталған және студенттер қазірдің өзінде дайындалып, мотивацияланады деп күтілуде.

STEM білім беру бағдарламасын қолдана отырып зерттеу құзыреттілігін қалыптастыру әдістері оқытудың жобалық әдістерін, проблемаға бағытталған оқытуды, топтардағы ынтымақтастықты, сондай-ақ зерттеу қызметін ынталандыратын ортаны құру үшін маңызды.

Оқытудың жобалық әдістері-бұл нақты жобалар немесе міндеттер төңірегінде оқу процесін ұйымдастыруға негізделген педагогикалық тәсіл, бұл білім алушылардан белсенді қызметті, өз бетінше зерттеуді және алған білімдерін практикалық қолдануды талап етеді[7]. Бұл әдіс білім алушылардың проблемалық ойлау, ынтымақтастық, сыни ойлау және шығармашылық дағдыларын дамытуға ықпал етеді. Жобалық оқыту әдістерінің кейбір сипаттамалары:

- Білім алушылардың белсенді қатысуы: оқытудың жобалық әдістеріне білім алушылар жобаның мақсаты мен міндеттерін тұжырымдаудан бастап нәтижелерді ұсынуға және алынған қорытындыларды талқылауға дейінгі оқу процесінің барлық кезеңдеріне белсенді қатысады. Бұл оларға оқу материалын тереңірек түсінуге және өз бетінше зерттеу және шешім қабылдау дағдыларын дамытуға мүмкіндік береді.
- Нақты проблемалар мен міндеттер: оқытудың жобалық әдістері білім алушылар үшін практикалық маңызы бар нақты мәселелер мен міндеттерді шешуге бағытталған. Бұл инженерлік жобаларды әзірлеу, зерттеу жұмыстары, әлеуметтік жобалар немесе білім алушылардың қызығушылығы мен мотивациясын ынталандыратын басқа да міндеттер болуы мүмкін[6].
- Пәнаралық тәсіл: жобалық оқыту әдістері көбінесе әртүрлі салалар мен пәндерден білімді біріктіруді қамтиды. Білім алушылардың жобаның нақты мәселелерін шешу үшін математика, ғылым, технология, инженерия, өнер және басқа салалардағы білімді қолдана алады. Бұл оларға әртүрлі пәндер арасындағы байланысты көруге және алған білімдерін әртүрлі контексте қолдануға мүмкіндік береді.
- Ынтымақтастық және топтық жұмыс: көбінесе білім алушылар идеялармен алмасуға, бірлесіп жұмыс істеуге, мәселелерді бірге шешуге және жобаны орындау жауапкершілігімен бөлісуге болатын топтарда қамтиды. Бұл қарым-қатынас, ынтымақтастық және көшбасшылық дағдыларын дамытуға ықпал етеді.
- Нәтижелер бойынша бағалау: бағалау жобаны орындау және білім алушылардың алдына қойылған мақсаттарға қол жеткізу нәтижелері бойынша жүргізіледі. Бұл білім мен дағдыларды ғана емес, сонымен қатар студенттердің оларды практикада қолдану және нақты мәселелерді шешу қабілетін бағалауға мүмкіндік береді. Оқытудың жобалық әдістері білім алушыларда дербестік, шығармашылық, сыни ойлау және ынтымақтастық дағдыларын дамытудың тиімді құралы болып табылады. Олар оқуға деген қызығушылықты арттырады, оқу материалын түсінуді жақсартады және білім алушыларды қазіргі ақпараттық қоғамдағы

табысты мансапқа дайындауға көмектеседі[10]. STEM (Science, Technology, Engineering, Mathematics) жобалау биология сабағында қолдану өте тиімді әдіс. Бұл тәсіл білім алушылардың ғылыми білімді тек теориялық тұрғыда ғана емес, нақты тәжірибе арқылы түсінуге мүмкіндік береді. Биология сабағында STEM жобалау әдісін қолдану және білім алушылардың проблемаларын шешу дағдыларын, шығармашылық қабілеттерін және топта жұмыс істеу дағдыларын дамытуға ықпал етеді. Мұндай жобалар білім алушылардың биология мен технологияның өзара байланысымен таныстырып, оларды ғылыми зерттеулер жүргізуге ынталандырады.

STEM жобалау әдісін әр бағытта қолдану мысалында:

1. **Экологиялық жүйелерді зерттеу мысалында:**

Білім алушылар экосистема моделін жасау арқылы табиғи ортадағы биологиялық қатынастарды зерттейді. Бұл жобада олар әртүрлі түрлердің бір-бірімен қалай әрекеттесетінін, қоректік тізбектерді қалай құрайтынын және экосистеманың тұрақтылығын қалай сақтайтынын түсінеді[8].

2. **Генетика және ДНҚ зерттеулерінде:**

3. Білім алушылар ДНҚ құрылымын модельдеу немесе генетикалық зерттеулер жасау арқылы тұқым қуалау заңдылықтарын зерттейді. Мұндай жобада олар молекулалық биология мен генетиканың негіздерін түсініп, генетикалық кодты талдай алады.

4. **Биологиялық зерттеулер үшін бағдарламалауда:**

5. Оқушылар биология саласында қолданылатын деректерді талдау үшін бағдарламалау тілдерін қолдана алады. Мысалы, олар тірі организмдердің геномын немесе экологиялық зерттеулердің мәліметтерін өңдеуге арналған қарапайым бағдарламалар жаза алады [9].

6. **Өсімдіктер мен жануарлардың физиологиясында:**

7. Биология сабағында оқушылар өсімдіктер мен жануарлардың физиологиялық процестерін модельдеу арқылы олардың денсаулығын және тіршілігін сақтаудың ғылыми негіздеріне көз жеткізеді. Мысалы, олар су айналымы немесе фотосинтез процессін интерактивті түрде зерттей алады.

8. **Жасанды интеллект және экологиялық мониторинг құруда:**

9. Оқушылар жасанды интеллекттің көмегімен экологиялық мониторинг жүргізетін жүйелерді зерттей алады. Мысалы, олар ауа сапасын немесе судың ластану деңгейін анықтауға арналған датчиктер мен қосымшаларды жасауға бағытталған жобалар әзірлей алады.

STEM жобаларында қолданылатын әдістер:

- **Проблемалық оқыту:** білім алушылар нақты биологиялық мәселелерді шешу үшін зерттеу жүргізеді.
- **Коллаборативті жұмыс:** Топтық жұмыс арқылы оқушылар бір-біріне көмектесіп, ғылыми мәселелерді шешеді.
- **Инновация:** Жаңа идеяларды енгізу арқылы оқушылар өз шешімдерін табуға тырысады.

Эксперименттер мен модельдер құру: Теориялық білімді тәжірибе арқылы тексеру.

Бұл жобаларды жүргізу барысында оқушылар тек биология пәнін ғана емес, сонымен қатар ғылыми зерттеулердің әдіснамасын, инженерлік шешімдерді және технологияның маңызын түсінеді. STEM жобалауы оқушылардың ғылымға деген қызығушылығын арттырып, оларды болашақта осы салаларда жұмыс істеуге ынталандырады[2].

Аннотация

STEM білім беру бағдарламасы арқылы білім алушылардың зерттеушілік қүзыреттіліктерін қалыптастыру олардың кәсіби өсуіне және осы саладағы болашақ мансапқа дайындалуына ықпал етеді. Олар тек білім ғана емес, сонымен қатар өз білімдерін іс жүзінде сәтті қолдануға және биология саласындағы мамандардың сұранысына ие болуға көмектесетін дағдыларды алады. Биология сабағында STEM жобалау әдісін қолдану және білім алушылардың проблемаларын шешу дағдыларын, шығармашылық қабілеттерін және топта жұмыс істеу дағдыларын дамытуға ықпал етеді.

Аннотация

Формирование исследовательских компетенций студентов посредством образовательной программы STEM способствует их профессиональному росту и подготовке к будущей карьере в этой области. Они получают не только знания, но и навыки, которые помогут им успешно применить свои знания на практике и быть востребованными как специалисты в области биологии.

Чтобы использовать метод проектирования STEM на уроках биологии и развивать у учащихся навыки решения проблем, способствует развитию творческих способностей и навыков работы в команде.

Annotation

Building students' research competencies through a STEM education program helps them grow professionally and prepare them for future careers in the field. They acquire not only knowledge, but also skills that will help them successfully apply their acquired knowledge in practice and become sought-after specialists in the field of biotechnology.

To use the STEM design method in biology classes and develop students' problem-solving skills, promotes the development of creativity and teamwork skills.

Кілт сөздер: Биология сабағында STEM , білім беру, зерттеу, дағды

Ключевые слова: STEM на уроке биологии, образование, изучать, навык

Key words: Biology in STEM class, I'll take it, education, study, skill

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МУЗЫКА САБАҒЫНДА ОҚУШЫЛАРДЫҢ РУХАНИ МӘДЕНИЕТІН ҚАЛЫПТАСТЫРУДЫҢ ӘДІСТЕРІ

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Серікбай Қарақат

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Аннотация: Еліміз егемендік алып, келешекке үлкен үмітпен бұрыс жасап жатыр. Қандай мемлекеттің болса да, бет бейнесі мен келешегі жастарға байланысты. Жастар болғанда да, талапты өнерлі жастарды айтамыз. Олай дейтін себебіміз, ұлттық тәрбие алмаған жастың ұлттық рухы болмайды. Алға қойылған орасан зор міндеттерді жүзеге асыратындар да - жастар. Сондықтанда біз келешекте қуатты мемлекет, зиялы қауым құрамыз десек, жастарды өнегелі рухта, т.б. көптеген салт-дәстүрлеріміз тұрғысынан тәрбиелеуіміз қажет. Осы талап, міндеттерді орындаған ең бір пәрменді құрал-оқу, тәлім-тәрбие жұмыстарында халықтық педагогиканың алтын мұрасын, қанша уақыт өтсе де-тот баспайтындай адалдығы айнадай ұлттық қазынаны пайдалану.

Қоғам жаңашаланып, өткеннің мәдени – тарихи мұралары ортамызға қайта оралып, оның рухани құндылықтары, дәстүрлері, өнерлері адамның адамзат болып қалыптасуына, тұтас алғанда жеке адамды әлеуметтендіру ісінде маңызды роль атқаратындығын көрсетіп отыр. Сондықтан адамзат тарихындағы ең асыл мұраларын қолдан шығарып алмай, білім саласындағы осы “Ақтаңдақтардың” бетін ашып, көне мәдениетімізге тереңірек үңіліп өткен уақыттың рухани мұрасын саралау, талдау қажеттігі туып отыр. Осы орайда, қазіргі кезде қоғам алға қойып отырған мәселе осы төңіректе. Көптеген білім беру жүйесіндегі жаңашаландыру бағыты, ең алдымен, тәрбие мәселесіне әкеліп соқтырады. Оқу-тәрбие процесін бір тұтас алып жүретін халықтық педагогика аталған білім мен тәрбиелеу мазмұнын жаңартуға жәрдемдесе алады.

Кілт сөздер: құндылық, оқу, тәрбие, қалыптастыру, тұлға, салауатты өмір, ұлттық педагогика, рухани.

Кіріспе: Жалпы білім беретін мектептердегі музыка сабағын оқыту тарихына назар аударсақ, қолданылып келген 1-6 сыныптарға арналған музыка сабағы бағдарламаларының негізінде музыкалық сауаттылық, хормен ән айту, музыка тыңдау сияқты музыкалық іс-әрекеттің түрлері қолданылады. Үйрену және тыңдау үшін атақты қазақ халқының музыкалық шығармалары яғни ән-күйлері ұсынылады.

«Елім-ай», «Мұрагер», «Музыка» бағдарламаларының тақырыптық мазмұны өмірмен байланыстыру ұстамына негізделі отырып, мақсатты түрде тәрбиелік бағытқа бағытталған. Бағдарламада туған жерге, Отанға, Қазақстан табиғатына сүйіспеншілікке баулуды, көңіл-күйді сезімдік қабылдау арқылы жүзеге асыруды көздейді.

Музыка сабағы барысында оқушылар ән өнерінің қандай жанрлары, түрлері, олардың ерекшелігі туралы түсінік алады. Мысалы, қазақтың халық әні қорында тұрмыс-салттық, лирикалық және еңбекке байланысты туған әндермен қатар әр алуан тақырыптарды қамтитын тақпақты, сазды әуендердің де кең өрістенгенін көрсетеміз. Қазақ халқының ән өнерінің кең айдынынан типтік екі сала анық байқалады. Ол – тақпақ сазды-речитативті

әндер және әуенді, шалқымалы, кең үнді әндер. Басқаша айтқанда, бірінші түрі – желдірте, термелеп, толғай айтылатын жырлар, екіншісі – созылып айтылатын кең үнді, әуез-мақамының сымбаттылығы әр күйлі, бірде бәсең, бірде көтеріңкі келетін шалқымалы, күрделі әндер. Мұның екеуі де халық арасына кең тараған, әрі ән өнерінің биік тұғырына айналып, оның бүкіл даму барысына әсерін тигізгенін оқушыларға көрсету керек.

Эпос негізінде қалыптасқан терме ән формаларының мазмұн жағынан алып қарағанда, алуан сырлары бар. Тарихи оқиғаларды, халықтың салттық-ғұрыптық ерекшеліктерін сипаттауда терме мен желдірменің көркемдік ерекшелігі мол. Ел өмірінің барша тыныс-тірлігінің ең нәзік деген пернелерін, алып ұшар көңіл күйін дөп басып, бірде екпінді, бірде баяу түрлі нақышпен суреттейтін терме мен желдірменің өлеңдік, әндік, әуендік формалары мол. Мұнда бірде мақтау, мадақтау, бірде дидактикалық сарын, сатира кездессе, енді бірде лирикалық нәзік леп ұшырасады. Терме мен желдірме кәнігі, профессионал орындаушылардың тәжірибесінен де мықтап орын алды. Әсіресе суырып салма, төкпе ақындар творчествосында олардың негізгі әуен сазына айналып, берік бекінген. Бұл формалар кеңінен кездеседі.

Термедегі әуен сазына, вокалдық речитацияға сыңаржақ қарау ағаттық болар еді. Өйткені музыка ағылған ақын жырына көтеріңкі леп қосып, дауыс бояуын қоюлата түседі де, тыңдаушыны эстетикалық ләззатқа бөлейтін ерекше пәрменді фактор. Терме сөзі көркем де келісті болса, ал айшықты музыка сазы – оның мазмұнын байытып, көркемдігін арттырып, құлпырта түседі.

Қазақ әндерінің дені лирикалық сипатта болғанымен, әр алуан қамтиды. Бұл әндерге көбіне сұлу табиғат көріністері арқау болып, адамның жүрегіне етене жақын туған өлкеге деген іңкәрлік жыр маржаны болып төгіледі. Көшпелі ел тұрмысында маңызы зор болған төрт түлік мал, үй жануарлары туралы да көптеген лирикалық әндер баршылық. Алайда лирикалық әндерде негізінен екі жастың арасындағы махаббат, ғашықтардың бір-біріне деген ынтық сезімі, хас сұлудың ғажайып көрік-келбеті жырланады.

Сонымен қатар мұндай шығармаларда жүректегі мұң мен зар, қайғы мен қуаныш, сүйеніш пен күйініш суреттеледі. Лирикалық халық әндеріне тарихи тақырыптар да арқау болады. Тарихи тақырыптағы әндерге мұң мен зар өзек болғанымен, бұл әндер жасық, жылауық емес, оларда қайтпас қажыр-қайрат, өрттей шалқыған оттылық пен жігер мол.

Халқымыз жанға жайлы, эпикалық серпінді лирикалық әндерге де бай. Оларға әңгіме түрінде баяндаушылық әдіс, эпостық шалқар еркіндік қасиет тән.

Халық творчествосының интонациясы, саздылығы мен нақыш-бояуы әр түрлі болғанымен, олар өнерімізге тән ортақ ұлттық сипатты айқын аңғартады. Қазақстанның әр тарапында әр түрлі орындалатын әндерге ортақ қасиет олардың халықтық музыка өнерінің өзіне тән сипатын бейнелеудегі бір тұтастығы болып табылады.

Кең үнді, шалқымалы лирикалық әндері сан ғасырлар бойы эпостық сипатта, речитативті-тақпақ сазды әндермен қатар дамып келген еді. Ал одан бергі дәуірде де қазақ халқы өзгеше ұлттық белгілері мол ән өнерін кемелдендіре отырып, мезгіл тынысымен үйлесімді музыкалық дәстүрін қалыптастырды. Ұлттық ән дәстүрі қазақ музыка мәдениеті жанрларының қалыптасып, дамуы үшін сарқылмас қайнар көз болып келеді.

Музыка сабағы барысында оқушылар атақты әнші туралы мәліметтер алады. Ол, мысалы, Біржан сал, Ақан сері, Жаяу Муса, Естай, Майра және т.б. Олар ұрпақтан ұрпаққа асқақ әншілік эстафетасын жеткізушілер, музыкалық мұрамызды түрлендіріп, оны мазмұндық жағынан байыта түскен шеберлер. Әрбір ұлттың өмір салты, тұрмысындағы, әдет-ғұрпындағы өзгешелігі, түсінік-тағлымы, психикалық-мінез ерекшеліктері оның өнер өрісіне үлкен әсер етеді. Сондықтан да ән жанры ұлттық музыка мәдениетіміздегі ең танымал, халыққа неғұрлым етене жанр саналады.

Ән – қазақ опера жанрының шығуына (әсіресе, алғашқы опералары – «Қыз Жібек», «Жалбыр») негіз болды деп оқушыларға түсіндіру керек.

Композитор Е. Брусиловский ән-күй арқылы музыкалық образ жасаумен бірге драматургиялық шиеленістерді, оқиғаларды бейнеледі. Мәселен, «Қыз Жібек» операсында әр образға лайықтап «Гәкку», «Толқыма», «Раушан», «Дүние-ай», «Жиырма бес» тәрізді әндер алды. «Жалбыр» операсында «Елім-ай» әнін шығарманың басынан аяғына дейін музыкалық арқау – лейтмотив ретінде пайдаланып, халық творчествосының екінші өмірге – профессионалдық жаңа арнаға жеткендігін көрсетті.

Осылай оқушылардың музыка сабағы барысында ән өнері жанрлары, орындаушылық мәдениеті, ұлттық дәстүрі, өнер қайраткерлері туралы алған мәліметтер арқылы эстетикалық көзқарасы қалыптасады.

Негізгі бөлім: Оқушыларға музыкалық білім беру бірнеше сатыда өтеді. Белгілі музыкатанушы А.Н.Сохор жүйелік-құрылымдық жолмен шартты түрде оны екі үлкен сатыға топтайды: алдын ала және негізгі. Алдын ала өтетін саты шығармаға қызығушылықтың пайда болуынан және оны қабылдауға мақсаттанудан құралады. Ал негізгі саты тыңдау, түсіну, толғану, оны өз жанымен ұқсастыру яғни өз сезіміне бейім тұлға және бағалау үрдістерін қамтиды [1]. Бұл пікірді музыка зерттеушісі Л.Г.Арчажникова да қолдайды. Сабақта музыкалық шығарманы қабылдауда алдын ала әдебиет материалын қолдану оқушы қызығушылығын күшейтіп, оның тыңдаушылық мақсаткерлігін белгілеуге көмектеседі, музыкаға деген қажеттілікті туғызады.

Сонымен, музыка мұғалімдерінің алдында тұратын талаптар шартты түрде нақты музыкалық шығарманы қабылдауда мынадай кезеңдердің ұйымдастырылуына қызмет етеді:

- шығармамен танысу (мұғалімнің кіріспе сөзі, шығарманың авторы, туу тарихы туралы әңгіме, шығарманы алдын ала ұнтаспалардан тыңдату);
- оны талдау (жеке көріністерін қабылдау, жекелеген мәнерлеу, көркем бейнелердің дамуы мен драмалық шиеленістерін әдебиет материалдарымен байланыстыруға көңіл бөлу, шығарманы бұрыннан белгілі басқа музыкалық шығармалармен салыстыру);
- қалыптасқан, игерілген тәжірибе негізінде шығарманы неғұрлым жоғары деңгейде (композитор туралы, шығарманың шығуы туралы, мазмұны туралы тереңірек деректер, қажетті әдеби баяндамалар қолдану арқылы музыкалық шығарманы тереңірек қабылдауға бағытталған жұмыстарды алдын ала атқара, енгізе, үйлестіре отырып) қайта қабылдау;
- шығарманы қабылдауды одан кейінгі сабақтарында жалғастыру, оны өзгелермен салыстыру.

Музыка сабағының бағдарламалары мазмұнының құрылымына жаңа ізденістер енгізілді. Бағдарламаның тұнғыш рет ұлттық музыка негізінде жасалуына байланысты ондағы қамтылған тақырыптар көбінесе халық музыкасы үлгісінде құрылып, кәсіби музыка дәстүрлерімен жалғасады. Халық әндері, күйлері, билері, домбыра тарту, халық сазгерлерінің әндері, күйлері біртұтас қазақ музыка мәдениетінің салалары ретінде ұсынылса, сонымен қатар бұл ұстанымның Қазақстандағы кәсіби музыка мәдениетінің қалыптасуы, мәдени орындар, музыка мәдениетінің қайраткерлері, Қазақстан сазгерлерінің аспаптық музыкасы, хор, кантата, оратория жанрлары, опера, балет, киномузыка өнерлері сияқты тақырыптармен дамытылып, толығымен түседі. Бағдарламада әлем халықтарының кәсіби музыка өнеріне де елеулі орын берілген.

Е.Брусиловскийдің «Қыз Жібек» операсында пайдаланылған «Гәкку» әнінің кезінде көптеген варианттары болғанын, оның төртеуін В.Затаевичтің Иса Байзақов орындауынан жазып алғанын, ал қазіргі эстрадада орындалып жүрген «Гәкку» әнін халыққа жеткізуші белгілі әдебиетші ғалым М.Дүйсенов екенін айта келіп, оларды салыстыру арқылы В.Затаевичтің өңдеуіндегі ерекшеліктерді «Қыз Жібек» фильмінен немесе Күләш Байсейітова

даусының жазбаларынан тыңдату – бұның бәрі мұғалімнің ән туралы көркем сөзі болып, музыкамен бірқатар өріліп ұсынылды.

Ән өнерінің шығармаларын келтіріп, сабақты кешенді жолмен атқару оның біртұтас үш дидактикалық мақсаттарының жүзеге асуын қамтамасыз етеді. Атап айтқанда: білімділік (жаңа музыкалық білім, жаңа музыкалық шығармалар, т.б.), тәрбиелік (әр түрлі музыкалық әрекеттер барысында адам-сүйгіштікке, елжандылыққа, адамгершілікке, т.б. саналарға баулу белсендігі), дамытушылық (музыканы сезіну сезімдері, оның шығарманың тікелей өз идеясымен байланысын аңғару, түйсіну әрекеттері, музыкалық шығармаларды дауыспен немесе аспаптарда орындау дағдылары, сезім-түйсінулері өткірленіп, оны жеткізуге шығармашылдық түрде өз бетінше ұмтылуы, музыкаға және әдебиет материалдарына көңіл қою, жауап беру сезімталдықтары, шығармашылдық әрекеттері, т.б. дамиды) сияқты мақсаттар қамтылып, жүзеге асып отырады. Сөйтіп, осынау әдіс-тәсілдер арқылы өзара байланысты үш бағыттың – оқушылардың санасына, сезіміне және мінез-құлқына бір мезетте ықпал етуіне жағдай жасалынады.

Сөйтіп, жалпы білім беретін мектептегі сабақта музыкалық шығарманы орындау алдында, ол туралы әңгіменің бірқатар қолданылуы дидактикалық шарт болып есептеледі. Орындалған музыканың түсінікті болуы, бейнелер ассоциациясының пайда болуы да үлкен мәнге ие. Логикалық пайымдауға, тыңдауға, музыка әлеміне енуге оқушыларды неғұрлым жақындату керек. Бұл міндетті шешуге нақты сыныптағы оқушылардың қабылдау мүмкіндіктерін және музыкалық дайындықтарын ескеріп құрылған мұғалім сөзі қызмет етеді.

Сыныптан тыс музыкалық-эстетикалық тәрбие әдістерінің сан түрлілігі музыкалық өнердің ерекшеліктерімен және оқушылар әрекеттерінің өзгешеліктерімен айқындалады. Әдістер бөлек қолданылмайды. Мысалы, музыкалық шығармамен балаларды таныстыруды мұғалім сазгер туралы, оның бұрын оқылған басқа туындылары туралы әңгімемен бастайды, бұл – сөздік әдіс; әңгіме барысында шығарманың жекелеген үзінділерін тыңдатып отырады, ол – көрнекі есіту әдісі; шығарманың туу тарихы, оны орындаушылар туралы аса қызықты мәліметтер, әдебиет материалдары қолданылады, бұл – ынталандырғыш әдісі, оқушылар мұғалім тапсырған шығармашылдық тапсырмаларды орындайды: тыңдай отырып, жеке үзінділерді салыстырады, талдайды, ол – талдау және салыстыру әдісі; шығарманың идеясын, көңіл-күйін анықтайды, бұл – жинақтау әдісі.

Сыныптан тыс жұмыста, музыкалық жұмыс оқушылардың эстетикалық көзқарасын қалыптастыруға, музыкаға қызығушылығын тереңдетуге және дамытуға, музыкалық әрекеттерінің неғұрлым белсенді танылып көрінуіне бағытталады. Оқушыларға арналған концерт-әңгіме, лекция-концерттерде, музыка туралы әңгімелесуде, музыкалық кештерде, музыкалық спектакльдерде, пікір сайыстарда, т.б. сол сияқты музыкалық-эстетикалық мақсаттағы қайсы-бір сыныптан тыс жұмыста болмасын, бірнеше міндеттерді шешуге бағытталады: көркемдік міндет, ол – музыканы неғұрлым қуатты қабылдауға, музыкалық қабылдауды мүмкіндігінше саналы түсінуіне қызмет етеді, мәліметтер мен деректер береді; тәрбиелік, ол – көркем үлгілерді тәрбиелік құрал ретінде қолданылуын қамтамасыз етеді [2].

Сыныптан тыс музыкалық-эстетикалық жұмыстарда оқушылардың музыкалық әрекеттерінің артуына неғұрлым ықпалды да тиімді болуы үшін практикалық жұмыстары белгілі бір шарттар негізінде ұйымдастырылды. Аталмыш жұмыс мына мазмұнда жүргізіледі:

- оқушылардың музыкалық танымын кеңейтуіне мақсатталған сыныптан тыс жұмыстағы сынып жетекшісінің ән өнерінің шығармаларының қаншалықты пайдасы болмақ, оған оқушылар қалауында сұраныс пен мұғалімнің дидактикалық жоспары бойынша қажеттілік бар ма, сауалдардың нәтижесі қорытындыланады. Осы мәселеден кейін ән өнерінің туындылары іріктеліп, сабақ барысы бірізділікке негізделіп жүргізіледі. Оқушы осы

сабақтарының жүргізілуінің пайдасын өздері байқап, оларда көзқарас, ынта-ықылас пайда болады.

Ал танымдық қызығушылықтың пайда болуы музыка өнеріне деген білім, білік, дағдыларының қалыптасуына әсер етеді. Бұл мәселе практикалық зерттеу барысында оң нәтиже беруіне көмектесті. Оның шәкірттердің эстетикалық көзқарасын қалыптастыруға шын әсері қандай? Ән өнерінің материалдары шын мәніндегі қажет материалдар ма яғни олар мақсатталған нәтижелерге жетуді қамтамасыз ете ала ма? Мектептегі жоспарланған сыныптан тыс жұмыс пен мақсатталған материалды қолдануды қабылдау мүмкіндіктері жете зерттелген бе, олардың музыкалық-эстетикалық дайындығына бұл жұмыстар сәйкес пе, оның дамытушылық қуаты, мазмұны бар ма әлде қайталау болып шыға ма? Осындай сұрақтар қойыла отырып, жауабы алынады. Жауап мектепте өткізілген «Қазақтың бұлбұл қызы» атты лекция-концертте оқушыларға ән жанры туралы, әр түрлі қызығлықты әндер орындалумен қатар өрбітіліп, қазіргі жаңа ізденістерге жалғастырылды. Оқушылар отызыншы жылдардың бірінші жартысында көркемөнеріміздің тарихына қазақтың көрнекті әртісі және асқақ әншісі Күләш Байсейітованың (1912-1957) творчествосы туралы мәліметтерді лекция-концерт арқылы қабылдай отырып, жаңа ізденіс, жаңа жанрлық бағыттардың ерекшелігімен танысуға дайын күйге келді.

Мектеп практикасында эстетикалық көзқарасты әрбиелеудің негізгі жолдары - ән айту және музыка тыңдау. Солармен бірге сабақтың ән салу, музыкалық сауат секілді бөлімдері оқушылардың көзқарасын тәрбиелеуде маңызды орын алады.

Ән салу жаттығуы әдетте педагогтың сабаққа қойған басты мақсаты мен сыныптың құрамына байланысты 7-10 минут алады. Бұл бөліктің сыныпты вокалдық және интонациялық сарындау сияқты нақты оқу міндеттері бар. Дидактикалық материал ретінде көбінесе әртүрлі буындар мен сөздерге, нота аттарына, өткен немесе үйреніп жатқан әндерге, қысқа әндерге әндету (попевка) пайдаланылады. Бүкіл музыкалық материал сәл өзгеріспен жылдан жылға қайтталанады.

Егер мұғалім ескі жаттығуларға жаңа талаптар қоя алмаса, жаттығуларды әдеттегідей қайталау пайда әкелмегенімен қоймай, оқушылардың көңілін жабырқатады, бұл ырғаққа кесірін тигізеді.

Аспаптық шығармаларға құрылған тақырыптарда ән айту, әр түрлі міндеттерді орындауға көмектеседі: гармониялық және әуендік есту қабілетін, үйлесімділікті, ритмді сезінуді, сондай-ақ орындаушылық дағдыларының қалыптасуын дамытады, өйткені музыканың әсемдігі балаларды еліктіреді, олар әнді қалай болса солай айтпайды.

Осылайша ән айту жаттығулары педагогқа оқушылардың музыкалық есту қабілеттерін кеңейтуге, күрделі шығармаларды қабылдауға дайындауға, сабақ уақытын ұтымды пайдалануға, оқушылардың эстетикалық көзқарасын тәрбиелеуге көмектеседі.

Музыка тыңдау. Музыкалық тәрбиенің басты міндеттерінің бірі оқушылардың эстетикалық көзқарасын қалыптастыру барысында, біздер музыканы тыңдауға қатысты мектеп бағдарламасын толықтыратын және кеңейтетін материалдар таңдау барысында қиындықтарға кездесеміз. Шығармалар оқу-тәрбиелік мақсаттарға сай, жоғарғы көркем талаптарға келетін, оқушылардың қабылдауына оңай, олардың музыкалық тәжірибесіне жаңаша бір нәрсе енгізетін болуы тиіс. Қандай да бір тілді үйренгенде тек әріптер мен оларды буынға біріктіруді ғана емес, оның морфологиясын, синтаксисін оқу керектігін бәріміз білеміз. Бұларсыз балаларды кітап оқу барысында тілдің байлығын, әдемілігін, салмағын сезінуді, шығарманы бағалауға үйрете алмаймыз. Тұра сол сияқты музыка да қарапайым сауатылыққа ие болу жеткіліксіз. Музыкалық дамудың логикасын білмей және оны бөлшектей талдай алмай, музыканы толық қабылдау, сонымен бірге бағалау мүмкін емес. Мектептегі музыкалық-педагогикалық жұмыстың басты мақсаты – балаларды музыкалық даму процесіне талдау жасауға үйрету. Музыканы көпшілігі тыңдайды, бірақ азы

ғана естиді, әсіресе аспапты музыканы. Аламдар көбінесе қойылған музыканың жеке сәттерін қабылдайды, нақтырақ айтсақ осы сәттердегі аз әсерлерін ұғынады. Ал шығарма толығымен оларға түсініксіз болып қалады.

Оқушыларды музыкалық тәрбиелеу іс-әрекеттің әр түрлерінде жүреді. Баланы музыкаға үйретудің ең жемісті болуы оның өз орындауында – іс-әрекеттің ең жеңіл, белсенді түрі хормен ән айту кезінде болады. Хормен ән айту – рухани мәдениетінің қайталанбас байлығы – тек өткеннің бағасы мұрасы ғана емес, сондай-ақ қазіргі музыкалық мәдениетті дамытудың қайнар көзі.

Хормен ән айтуға үйрету барысында адамның эстетикалық дамуына қажетті көптеген мәселелер қатысады. Бұл музыкалық танымды кеңейту, музыкалық және көркемдік талғамды қалыптастыру, қызығушы және дайын тыңдарманды тәрбиелеу, эмоциялық сфераны байыту және дамыту, музыкалық қабілеттерді шыңдау, эстетикалық көзқарасты қалыптастыру. Ең соңында, ән орындаушылықты тұрмысқа енгізу. Оның үстіне хормен орындаушылықты дамытуға көңіл бөлу маңызды.

Музыка пәндеріне қатысты айтсақ, олардың мақсаттары: оқушылардың музыкалық есту қабілетін дамыту, оларды бағдарламадағы әндерді ырғақпен дұрыс орындауға үйрету, қарапайым музыкалық сауатты игеру. «Музыканы тыңдау» бөлімі бойынша музыкалық шығармаларды білу сияқты маңызды, бірақ жеке міндеттерді орындаумен шектелмейді. Аталған міндеттердің әрқайсысын орындау жалпы кәсіби емес музыкалық тәрбиеде жекелеп емес, негізгі мақсатқа жету үшін қажетті – музыканы сүюге үйрету, ол арқылы эстетикалық әсерлерге бөлену, жоғары музыкалық талғам мен тұлғаның көзқарастары мен моралдық бейнесінің, идеялық-әдептілігінің қалыптасуымен үздіксіз байланысты идеяларды тәрбиелеу секілді кешенді түрде маңызды.

Музыканың тәрбиелік мүмкіншіліктері өте мол. Бірақ оның әсері шындығында эстетикалық, игілікті болуы үшін, нақты жүйелік, дұрыс бағытталған жұмыс қажет, әйтпесе ең әдемі музыканың өзі қажетсіз, түсініксіз, жат болуы мүмкін. Сондықтан да балаларды қандай да бір дағдыларға үйреткенде, музыкалық мағлұматтарды бергенде, музыкалық шығармалармен таныстырғанда мұғалім үнемі бұл білімнің балаларға не беріп жатқанын, қандай ойлар мен сезімдер тудыратынын естен шығармағаны жөн.

Музыкалық-тәрбиелік үрдістің күрделілігі бірқатар сәттермен айқындалады. Мысалы, сабақты ұжымдық түрде өткізу барысында мұғалім әрбір оқушының мүмкіндігін ескеруі тиіс. Оның үстіне, мағынасы бірдей тапсырма оқушылардың жалпы және музыкалық дамуының әртүрлі сатысында олардың жас ерекшеліктеріне қарай әр түрлі орындалады. Әрбір музыка сабағының элементі, тіпті нота жазуын оқуға жаттығу немесе қарапайым ырғақтық-ритмикалық жаттығулар оқушыларды музыкаға тартып, музыкалық өнер сабағы болуы тиіс. Сондықтан да сабақтардың басты қажеттілігі – эмоциялық толыққандылық, оқушылардың кез келген тапсырмаға белсенді шығармашылықпен, эстетикалық тұрғыдан қарауы болуы керек.

Сыныпты бір үнділікке келтіру сияқты ең қарапайым жаттығудың өзі дыбысталудың айрмашылығын үйретіп, әдемі айтуға тәрбиелегенде эстетикалық құнды болады. Балаларға әсем музыкалық шығармаларды айтуға және тыңдатуға болады, бірақ оларды талдау, балалардың ішін пыстырады.

Музыка сабағына кіретін әрбір бөліктің мазмұнын балаларға бірте-бірте бергеннің өзінде музыкалық үрдістің бүтіндігін, бірлігін, жүйелілігін сақтап қалу өте қиын. Хормен ән айтуда, музыка тыңдау да, музыкалық сауат да оларды игеру барысында сабақты құрудың нақты логикасын талап етеді. Сонымен қатар, олардың сабақтағы үздіксіз байланысы бағдарлама материалын толық игеруді қамтамасыз етуі мүмкін.

Егер музыканың біздің оқушыларымыздың өміріне қалай кіретін бақыласақ, оның жолдары мен түрлерінің көп екендігін, кейде олардың өзара байланыстылығының

жоқтығын, мұның өз кезегінде жасөспірімдердің музыкалық дамуы мен тәрбиесінде қиындықтарға алып келетіндігін байқаймыз. Қазіргі заманда кино, радио және телехабарлар арқылы, аудиотаспалар арқылы музыка көп берілетіндіктен балалардың музыкалық мәдениеті туралы ойланбаса да болатын сияқты. Бірақ та, рухани мәдениеттің бұл түрінде ешқандай қауіп-қатер жоқ деп айтуға болмайды.

Осылайша, музыка, оның түрлері, жанрлары туралы, композиторлардың өмірі мен шығармашылығы туралы білімді музыканың өзімен таныса отырып алғанда, ол музыкалық танымның кеңеюше және көзқарасын қалыптастыруында маңызды роль ойнайды. Музыкалық үйрету мен білім беру – музыкалық тәрбиенің маңызды жолы, яғни, дамыған музыкалық қабілеті, жоғарғы талғамы, музыкаға деген қызығушылығы мен сүйіспеншілігі бар мәдениетті адамды тәрбиелеумен құнды. Егер оқушылар тек сауатты ән айтып, нота жазуын түсініп, кейбір шығармалармен таныс болса, бірақ шынайы көркем музыкамен кездескенде, ерекше қуаныш сезімін басынан өткізбесе, егер музыка олардың рухани әлемін байытпаса, адамдарға, олардың ойлары мен істеріне деген ойларын туғызбаса, әсемдікті марапаттап, ұсқынсыздықты төзбеу сезімдерін оятпаса, онда басты мақсат орындалмайды: балалар ең бастысы – музыкалық-эстетикалық тәрбие алмағандығы.

Шығармашылықпен жұмыс істейтін мұғалім ең алдымен сабақтың дидактикалық мақсаты мен оқу материалының мазмұнына сәйкес әр түрлі әдістерді пайдаланып, оқушылардың мәдени деңгейін көтеруге, музыкалық қабілеттіліктерді, эстетикалық көзқарасты қалыптастыруға көңіл бөлуге жөн.

Оқушылармен сабақтан тыс жүргізілетін тәрбие жұмыстары мұғалім сабақ үстінде жүзеге асыратын тәрбие жұмысын толықтыра және тереңдете отырып, ең алдымен балалардың таланттары мен қабілеттерін неғұрлым толық ашудың, олардың белгілі бір нәрсеге қызығушылығы мен ынтасын оятудың құралы ретінде қызмет атқарады; ол оқушылардың бос ауқытын ұйымдастырудың формасы болып табылады және олардың адамгершілік мінез-құлыққа жаттығуын ұйымдастырудың, адамгершілік мінез-құлық тәжірибесін, эстетикалық көзқарасын қалыптастырудың негізі ретінде қызмет атқарады. Оның орамдылығы, мазмұнын түрлендіру және белгілі бір істерді орындау үшін балаларды әр түрлі орналастыру мүмкіндіктері оқушыларға жеке дара қатынас жасауға өте үлкен мүмкіндіктер ашады.

Тәрбие жұмысы бірнеше бағыттар бойынша жүргізіледі. Мұғалім өз пәні бойынша ұйымдастыратын үйірме жұмысын бөліп қарауға болады. Мысалы музыка бойынша пәндік үйірмелерге бірнеше параллель (немесе аралас) сыныптардың оқушылары тартылады: лекторий, аспаптық ансамбль, вокал тобы және т.б. Үйірмелерге әдетте мектеп әдейілеп шақыратын оқытушылар немесе оқушылардың ата-аналарының бірі басшылық жасайды. Жұмыстың бұл саласы өз мамандығына тіпті де байланысты емес, бірақ бос уақыттағы сүйікті ісі болған жағдайда мұндай үйірмелерді мектеп мұғалімдері де жүргізеді.

Үйірмелер жыл аяғында өздерінің қол жеткен табыстарын көрсетуге тиісті. Одан әрі сынып жетекшісі бүкіл сыныппен өткізетін шараларды: сынып жиналысын, арнаулы этикалық әңгімені және т.б. бөліп көрсетуге болады.

Мектептің балалар және жасөспірімдер ұйымдары жүргізетін жұмыстар, атап айтқанда осы ұйымдарының қатысуымен жасалатын мектептің тәрбие жұмысының жоспары бойынша өткізілетін жалпы мектептік шаралар: лекциялар мен баяндамалар, мүшелді тойлар, мектеп бітірушілермен кездесулер, мектеп мерекелері, жалпы мектептік еңбек жұмыстары және т.б. үлкен орын алады.

Оқушылармен оқудан бос уақыттағы барлық сыныптан тыс жұмыстарды (үйірме жұмысын), мұғалімдер, сынып жетекшілерінің қатысуымен және басшылығымен өткізілу мүмкін.

Қазіргі кезде барлық сыныптан тыс, оқудан тыс жұмыстар көркемдік ұйымдары арқылы (сыныптарға сәйкес) өткізіледі. Бұдан осы ұйымдарға мүше оқушылардың инициативасы мен тапқырлық шеберлігінің арта түсуі, олардың өз бетінше әрекет етуінің күшеюі және балалардың ұйымдарының бүкіл оқушылар алдындағы беделінің нығаюы байқалады.

Сабақтан тыс жұмыстарының негізгі мақсаттының бірі — оқушыларға эстетикалық тәрбие беру.

Мектепте оқушылардың бойында өздерін шама-шарқынша өнерде көрсете білуге тәрбиелеу міндеті алға қойылады. Ал бұл үшін оқушының өнермен - музыкамен шұғылдануға қажетті кейбір іскерліктер мен дағдылары болуға тиіс. Бұл салалардағы кейбір іскерліктері мен дағдыларға үйрету ісі музыка сабақтарында эстетикалық тәрбие жөнінде сыныптан тыс өткізілетін түрлі шараларға әзірлену және оларды өткізу процесінде жүргізіледі.

Мектеп өнерге ынта қойған және қайсыбір үйірмелерге, түрлі шараларға қатысқысы келетін оқушылардың бәрін қамтиды.

Эстетиканы қоршаған өмірге, тұрмысқа енгізуге ұмтылу көркемдік талғамды дамытуға ерекше тығыз байланысты және оның өзі алдымен киімнен, таранудан, жүріс-тұрыстан, үйдің, жұмыс орнының жиналуынан айқын көрінеді.

Оқушыларды тәрбиелеуде мінез-құлық эстетикасы жөніндегі, оқушыларды олардың сыртқы кейпіне де, сондай-ақ жүріс-тұрыс және мінез-құлық қалпына да қойылатын эстетикалық талаптар жүйесімен таныстыру жөніндегі жұмыстың едәуір орын алуға тиіс екені сөзсіз.

Жастарымыздың эстетикалық білім алуға деген ынтасы өте зор болып отыр. Оқушылар эстетикалық тәрбие саласында ара-тұра, батыраңқы түрде өткізілетін шаралармен (бұл арада жекелеген жиындар, лекциялар немесе әңгімелер т.б.) қанағаттанатын мектептер барған сайын азайып барады.

Қазіргі уақытта мектептегі бұл жұмыс барған сайын айқын ұйымдық формалар алуда. Мәселен, ең алдымен мектептерде эстетикалық тәрбие бойынша үйірмелер жиірек әрі көптеп ұйымдастырылуда.

Бұлар енді тек әдеби, сурет және хор жөніндегі үйірмелер емес, соңғы уақытқа дейін бұлар неғұрлым көп таралып, оларға мұғалімдердің өздері басшылық ететінді. Қазіргі уақытта мектептерге ақы төлеп арнаулы жетекшілер шақырылатын хореография және музыка үйірмелерін, сондай-ақ бейнелеу өнері жөніндегі үйірмелер құруға ата-аналар мен ата-аналар комитеттерінің қаржысы есебінен рұқсат етілген.

Көптеген осындай үйірмелер мен көркем өнерпаздар үйірмелері ата-ана-лардың өз күштерімен де құрылуда.

Өнер жөніндегі лекторийлер мен түрлі клубтар: «Музыканы сүюшілер клубы» т.б. құрылуда. Эстетикалық тақырыптарға диспуттар мен дискуссиялар ұйымдастырылуда.

Көркем өнерпаздар кештері мен байқаулары, ән мен би мерекелері өткізіледі.

Эстетикалық тәрбие бойынша сыныптан тыс өткізілетін бүкіл жұмыстарды ұйымдастыру, әрине, мамандарды - музыканттарды, көркем сөз оқушыларды, әншілерді, аспапшыларды керек етеді. Алайда мұғалімдердің өздеріне де арнаулы білімдер мен кең мәдени ой-өріс керек болады.

Өнердің белгілі бір салаларында мұғалімнің білімдері мен іскерліктері ғана болып қоймай, сонымен бірге даулы және екінің бірінде теріс бағалаған пікірлер айтатын оқушылармен дискуссия жасай білудің ерекше зор маңызы бар.

Нақ осы арада мұғалім сендіре білуге, айтысып, дәлелдей білуге, білімге, тәжірибеге негізделген өз сенімі арқылы тәрбиелей білуге тиіс.

Оқушылардың бейімділігі мен мүдделеріне немесе олардың тәрбиесінде бақылған олқылықтарға сәйкес бұл жұмыс түрлі кезеңдерде эстетикалық тәрбиенің белгілі міндеттері немесе салалары төңірегіне шоғырландырылуы мүмкін.

Мәселен, мұғалім оқушылардың музыкалық талғамдарының дамымағанына, олардың жеңіл музыкаға, әсіресе Батыстағы қазіргі музыканың формалистік даңғырақтарына құмарлығына алаңдайтын болса, басты назар музыкалық тәрбие беру жөніндегі жұмысқа арнайы шоғырландыруға тиіс. Бұл жұмыс классикалық музыканың таңдаулы үлгілерін тыңдайтын болып лекциялар ұйымдастыруды; бағдарламалық (программалық) музыканың концерттеріне баруды, концерттерде орындауға тиісті шығармаларды алдын ала талқылап, талдауды, оқушылардың өздеріне музыкалық иллюстрацияларды т.б. іріктеп алып, музыка туралы, жекелеген композиторлар немесе орындаушы-лар туралы әңгімелер мен баяндамалар жасауды тапсыруды қамтиды.

Оқушыларды шетелдік жеңіл және джаз музыкасының таңдаулы үлгілерімен таныстыру жөніндегі жұмыс та жүргізіле алады және жүргізілуге тиіс, сөйтіп, оқушылардың бойында осы музыкаға дұрыс көзқарасты қалыптастыру, жеңіл жанр артистерінің орындаушылық шеберлігіне талапты күшейту қажет.

Әсіресе Батыстағы қазіргі жеңіл музыканың насихатталып, бізге жіберіліп жататын кейбір үлгілерінің идеологиялық жағынан бағытталуына зор көңіл бөлінуге тиіс.

Қазіргі уақытта кино, радио, видео және телевизия іс жүзінде барша жұрттың қолы жететін игілікке айналып отыр, сондықтан мектеп олардың ықпалын ескеріп отыра алады және ескеріп отыруға тиіс.

Атап айтқанда, мектеп радио тыңдауға және телевизия хабарын көруге біраз ықпал жасап отыруға тиіс. Мәселен, мектепте қызғылықты әрі пайдалы хабарларды коллектив болып тыңдауды немесе көруді ұйымдастыруға, мұндай хабарларды күні бұрын белгілеп, олар жөнінде оқушыларға дер кезінде хабарлап отыруға болады. Мұғалімдер белгілі бір хабарды үйде тыңдау немесе көру жөнінде арнаулы тапсырмалар беріп, кейін оны мектепте - сабақта, жиналыста талқылай алады немесе тіпті хабарда көтерілген мәселелер жөнінде дискуссия ұйымдастыра алады.

Қорытынды: Эстетикалық тәрбие жөніндегі жұмыс тұтас алғанда әзірге жеткілікті дәрежеде дәйекті әрі жүйелі түрде жүргізілмей келеді. Осының салдарынан біздің оқушыларымыздың білім даярлығының жоғары дәрежесі мен олардың эстетикалық мәдениетінің төмен немесе бір жақтылығы арасында белгілі алшақтық бар екенін байқауға болады.

Осының бәрі эстетикалық тәрбие саласында мектептің алдында қыруар жұмыс тұрғанын көрсетеді.

Бұл жұмыстың жүйесіздігі, оқтатектелілігі, оны жүргізуге мұғалімдердің даярлығының жоқтығы барған сайын төзгіліксіз болып барады. Оқушыларға эстетикалық тәрбие беру жүйесін талдап жасау мектептің алдында тұрған аса, маңызды проблемалардың бірі болып табылады.

Қазіргі кезеңде музыкалық даму саласында ұлттық және халық әндерін жаттауға зор көңіл бөліну керек. Артықшылық жағдайдағы бірқатар мектептерде оқушыларды музыкалық сауат пен мәдениеттің кейбір негіздермен таныстыру қажет.

Жастардың осы музыкамен, әуестенуінің өте-мөте кең етек алағаны сонша, мұның өзі көптеген педагогтарды қатты алаңдатып отыр. Оқушыларға музыкалық тәрбие беру жөніндегі соңғы халықаралық конференциялардың бірінде мектептерде халық музыкасын енгізу туралы ұсыныс та енгізілді, мұндағы мақсат – халық музыкасының формалары мен ырғақтарына талдау жасау арқылы, жастардың әуен, ырғақсыз, даңғырап құртатын қазіргі кең тараған музыкаға деген кеселді ынтасын тым әуестенуін басу.

Оқушылармен оқудан тыс жүргізілетін тәрбие жұмыстарының барынша көптеген қарамастан жүзеге асырылатын бірқатар ортақ ұйымдастыру формаларын бөліп көрсетуге болады:

- салтанатты кештер (ертеңгіліктер) мен мерекелер;
- тақырыптық кештер мен ертеңгіліктер;
- еліміздің атақты адамдарымен және мектепке шақырылған өзге де адамдармен кездесулер;
- лекциялар мен баяндамалар;
- байқаулар, конкурстар, турнирлер, олимпиадалар мен жарыстар;
- көрмелер;
- экскурсиялар;
- демалыс кештері мен ертеңгіліктер;
- үйірмелер.

Жеке оқу пәндері немесе оқушылар қызығатын арнаулы салалар бойынша сыныптан тыс жұмыстар әдетте үйірмелердің, клубтардың, секциялардың, қоғамдардың сабақтары немесе отырыстары формасында өткізіледі.

Бірнеше ұйымдастыру формалары өзара сабақтасатыны жиі кездеседі: экскурсия көрмемен аяқталады; тақырыптық кештерде көркемөнерпаздар өнер көрсетеді, ойындар өткізіледі; көптеген үйірмелер, клубтар мен қоғамдар өз қабырға газеттерін, альбомдар шығарады, көрмелер ұйымдастырады.

Жоғарыда қарастырылған негізгі ұйымдастыру формаларының әрқайсысының өз ерекшеліктері бар екені және әрқайсысын өткізудің ерекше методикасын талап ететіні күмәнсіз.

Сыныптан тыс жұмысты өткізудің формасын таңдағанда ең әуелі тәрбие жұмысының нақты мақсаттары мен міндеттерін есте ұстау жөн. Ұйымдастыру формаларының біразы көбінесе шағын шеңбердегі тәрбиелеу міндеттерін шешу үшін қолданылатыны күмәнсіз. Мысалы, этикалық әңгімелер көбінесе адамгершілік тәрбие мақсаттары үшін қолданылады.

Екінші бір ұйымдастыру формалары неғұрлым универсалды болып табылады және оларға берілетін мазмұнға байланысты неғұрлым кең шеңбердегі тәрбиелеу міндеттерін шешуге қолданылады. Мысалы, кештер мен ертеңгіліктер, байқаулар мен конкурстар, көрмелер мен экскурсиялар, лекциялар мен әңгімелер осындай.

Сыныптан тыс жұмыстың жоғарыда талданған формаларының бәрі оқушыларды жаңа білімдермен байыта, олардың ақыл-ойын және ақыл қабілеттерін дамыта отырып, оқушылардың ой-өрісін кеңейтуге, эстетикалық көзқарасын қалыптастыруға өз үлестерін қосатыны анық.

Сонымен, біз келесі қорытындыларға келеміз:

- оқушыларға эстетикалық білім беріп қалыптастырудың негізгі формалары ретінде музыка сабағы мен сабақтан тыс жұмыстарды қолдануға болады;

- мектеп практикасында эстетикалық көзқарасты тәрбиелеудің негізгі жолдары – ән айту және музыка тыңдау. Солармен бірге сабақтың ән салу, музыкалық сауат, музыкалық тарихы секілді бөлімдері оқушылардың көзқарасын қалыптастыруда маңызды орын алады;

- оқушылармен сабақтан тыс жүргізілетін тәрбие жұмыстары мұғалім сабақ үстінде жүзеге асыратын тәрбие жұмысын толықтыра және тереңдете отырып, ең алдымен балалардың таланттары мен қабілеттерін неғұрлым толық ашудың, олардың белгілі бір нәрсеге қызығушылығы мен ынтасын оятудың құралы ретінде қызмет атқарады; ол оқушылардың бос уақытын ұйымдастырудың формасы болып табылады және олардың адамгершілік мінез-құлыққа жаттығуын ұйымдастырудың, адамгершілік мінез-құлық тәжірибесін, эстетикалық көзқарасын қалыптастырудың негізі ретінде қызмет атқарады.

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Ailədə və məktəbdə estetik tərbiyənin məqsədi

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**Ailə və bağça, uşaqları məktəbə,
məktəb isə həyata hazırlayır.**

Xülasə: Estetika fəlsəfi təfəkkürün bir qolu kimi öz mənşəyini uzaq keçmişdən alır və XVIII əsrə qədər hüsnüyyat, gözəllik elmi və yaxud poetika adı ilə öyrənilir. Estetikanın bizə məlum olan 2500 illik tarixi vardır. Estetika ardıcıl və sistemli olaraq ilk dəfə klassik yunan filosoflarının əsərlərində işlənmişdir. Böyüyən nəsilə bədii yaradıcılıq bacarıq və vərdişləri, bədii-estetik qabiliyyətləri inkişaf etdirmək. Şagirdlər incəsənətin bu və ya digər sahəsində müəyyən bacarıqlara yiyələnməli (musiqi alətində çalmaq, rəqs etmək, şəkil çəkmək, şer və ya hekayə yazmaq, bədii oxu və bədii tikişlə məşğul olmaq və s.), həyata, cəmiyyətə gözəllik ünsürləri bəxş etməlidirlər. Bu, həm də insanın özünütəşdidinin mühüm şərtini təşkil edir.

Açar sözlər: məktəbəqədər dövr, təlim-tərbiyə prosesi, estetik tərbiyə, yaş xüsusiyyətləri;

Ключевые слова: дошкольный период, учебно-воспитательный процесс, эстетическое воспитание, возрастные особенности;

Keywords: pre-school period, educational process, aesthetic education, age features.

Estetik tərbiyə hərtərəfli inkişaf etmiş şəxsiyyətin mühüm keyfiyyətlərindən biridir. Onun başlıca xüsusiyyəti uşaqlarda estetik hisslərin tərbiyə edilməsindən və bədii fəaliyyətin müxtəlif sahələrində yaradıcı qabiliyyətlərin inkişafından ibarətdir. Estetik tərbiyə uşaqda zövqün, bədii hisslərin, mühakimələrin təşəkkül tapmasını, möhkəmlənməsini təmin edən incəsənət əsərlərini, təbiət və cəmiyyətdəki gözəllikləri düzgün başa düşməyə kömək göstərən təsirlərin məcmusudur.

Estetik tərbiyə uşaqların yaş və dərk etmə səviyyələrinə uyğun mühakimələrin formalaşmasına kömək göstərməlidir. Məktəbəqədər yaşlı uşaqlar müşahidə etdikləri gözəlliklər haqqında mühakimə yürütməyi, nəyin pis, nəyin yaxşı olduğunu müəyyənləşdirməyi bacarmalıdırlar. Onlar yalnız baxmaq, eşitmək deyil, həm də görmək və duymaq qabiliyyətinə malik olmalıdırlar. Məktəbəqədər yaşlı uşaqlar tədrisən müşahidə etdikləri gözəl şeylər haqqında "gözəldir", "yaxşıdır", "çirkin şeylər haqqında isə "pisdir", "xəşm gəlmir" kimi ifadələri yerində işlətmək bacarığına yiyələnməlidirlər. Estetik tərbiyə əxlaq tərbiyəsi ilə vəhdətdədir. Uşaqda əxlaqi keyfiyyətlərin təkmilləşməsində estetik hisslərin təsiri, gözəlliklərdən ilhamlanmağın əhəmiyyəti çox böyükdür. Estetik hisslərin digər müsbət keyfiyyətlərlə qarşılıqlı təsiri daha güclüdür. İstər insandan, istərsə təbiət və cəmiyyətdəki gözəlliklərdən alınan zövq məktəbəqədər yaşlı uşaqların əxlaqına güclü təsir göstərir. Bu hiss nifrəti məhəbbətə, kədərini sevincə, xəbəsliliyi cəmərdliyə, kobudluğu nəcibliyə çevirmək qüvvəsinə malikdir. Estetik zövq uşağı kobud hisslərdən, vəhşi instinktlərdən, saxta həzzlərdən qoruyur. Yüksək estetik zövq uşaqda ləyaqətli, əxlaqi keyfiyyətlərin yaranmasını təmin edir. Estetik zövq nəinki uşağın sevincini artırır, həm də onu tərbiyə edir, mədəniləşdirir. Estetik tərbiyə uşaqların fiziki tərbiyəsi ilə də sıx bağlıdır. Gözəl qamət, yerləş, musiqi sədaları altında rəqs, bədii gimnastika, sırada düzgün hərəkət

uşaqların fiziki sağlamlığında çox əhəmiyyətlidir. Estetik tərbiyənin səmərəli olması üçün bir sıra prinsipləri rəhbər tutmaq lazımdır. Həmin prinsiplərə aşağıdakılar daxildir:

- Estetik tərbiyə insanın ideya-mənəvi tərbiyəsi, dünyagörüşünün formalaşması prosesi ilə əlaqəli şəkildə aparılmalıdır.
- Estetik tərbiyə müxtəlif sahələri əhatə etməlidir.
- Estetik tərbiyədə müəyyən sistem, təcridlik, ardıcılıq gözlənməlidir.
- Estetik tərbiyə prosesində uşaqların yaş xüsusiyyətləri nəzərə alınmalıdır.
- Estetik tərbiyədə məktəb, ailə, məktəbdənkənar müəssisələr, mədəniyyət ocaqları, bədii yaradıcılıq təşkilatları (rəssamlar, bəstəkarlar, yazıçılar birliyi və s.) ilə sıx əməkdaşlıq etməli, əlbir işləməlidir. Estetik tərbiyə sisteminə ailədə və uşaq bağçasında tərbiyə, təlim prosesində, sinifdən xaric, məktəbdənkənar tədbirlərdə insanlar arasında xoş münasibətlər daxildir. Estetik tərbiyənin bünövrəsi ailədə qoyulur. Ailə uşaq tərbiyəsinin ilk ocağı, ana laylası uşaqların eşitdikləri ilk melodiyadır. Ailədəki səliqə-sahman, təmizlik, uşaq oyuncaqları, ev avadanlığı və əşyaların gözəlliyi, valideynlərin oxuduqları mahnılar, şeirlər, nəql etdikləri nağıllar, gəzintilər kiçik yaşlardan uşaq zövqünü formalaşdırır.

Uşaq bağçasında estetik tərbiyə daha sistemli xarakter kəsb edir. Uşaqlarla estetikaya dair məşğələlər – təbiətlə, ətraf aləmlə tanışlıq, musiqi, rəsm, gil, plastilindən yapma, aplikasiya, quraşdırma işləri, əmək məşğələləri aparılır, didaktik oyunlar keçirilir, bayram və əyləncələr yüksək estetik səviyyədə təşkil edilir.

Estetik tərbiyə ahəngdar inkişaf etmiş şəxsiyyət tərbiyəsinin tərkib hissələrindən biridir. Estetik tərbiyə dedikdə, incəsənət və həyatdakı gözəlliklərin qavranmasına, estetik zövq və qabiliyyətlərin inkişafına yönələn təsirlərin məcmusu nəzərdə tutulur.

Estetik tərbiyə şəxsiyyət tərbiyəsində böyük rol oynayır. O, tərbiyənin digər tərkib hissələri ilə sıx bağlıdır. Estetik tərbiyə əqli tərbiyəyə kömək göstərir: o, insana bilik verir, həyatı dərk etməyə yardım edir.

Estetik tərbiyə insan əxlaqına güclü təsir göstərir. Ədəbiyyat, incəsənət insan mənəviyyatını zənginləşdirir, humanizm, xeyirxahlıq, vətənpərvərlik və başqa müsbət keyfiyyətlər formalaşdırır.

Varlığın insan tərəfindən estetik qavranması və düzgün əks etdirilməsi öz təbiəti etibarilə mürəkkəb prosesdir. Varlığın və incəsənətin bədii-estetik qavranması - estetik tərbiyənin ilkin mərhələsini təşkil edir. Qavramanın dolğunluğu, tamlığı, parlaqlığı sayəsində insanda müəyyən estetik hisslər, varlığa estetik münasibət formalaşır. Estetik hiss gözəlliyi duymaq, ondan həzz almaq bacarığıdır. Estetik qavramanın doğurduğu hisslər çox müxtəlif çalarlara malikdir: sevinc-kədər, məhəbbət-nifrət, həzz-ikrah, həyəcan, qorxu, təşviş, gülüş və s. Estetik hisslər insanda estetik tələbatların əsasında durur: insanın gözəllikdən keçirdiyi dərin emosional həyəcanlar, hisslər onda bədii-estetik dəyərlərlə ünsiyyətə ehtiyac doğurur. Estetik şüur və hisslərin təsiri ilə estetik zövq formalaşır. Estetik zövq estetik ideal baxımından gözəlliyi qiymətləndirmək bacarığıdır. Estetik zövq əsasında insanda estetik mühakimə - varlığa, incəsənətə əsaslı, ümumiləşmiş ideya-emosional qiymətləndirmə bacarığı formalaşır. Estetik tərbiyənin məqsədinə aşağıdakılar daxildir:

1. Məktəbdə estetik tərbiyə bir neçə vəzifəni həyata keçirir.
2. Gənc nəsilə estetik baxış və təsəvvürlər, estetik şüur aşılamaq və inkişaf etdirmək.
3. Estetik hisslər və bu əsasda varlığa və incəsənətə estetik tələbat formalaşdırmaq.
4. Estetik zövq və mühakimə bacarığı formalaşdırmaq.

Estetik tərbiyənin səmərəsi üçün bir sıra prinsipləri rəhbər tutmaq lazımdır. Həmin prinsiplərə aşağıdakılar daxildir:

1. Estetik tərbiyə insanın ideya-mənəvi tərbiyəsi, dünyagörüşünün formalaşması prosesi ilə sıx əlaqəli şəkildə aparılmalıdır.
2. Estetik tərbiyədə müəyyən sistem və ardıcılıq gözlənməlidir.
3. Estetik tərbiyə hərtərəfli aparılmalıdır.

4. Estetik tərbiyədə tədriciliyi gözləmək vacibdir.

5. Estetik tərbiyədə uşaqların yaş xüsusiyyətləri nəzərə alınmalıdır.

6. Estetik tərbiyədə məktəb, ailə, məktəbdənkənar müəssisələr, mədəniyyət ocaqları, bədii yaradıcılıq təşkilatları (rəssamlar, bəstəkarlar, yazıçılar birlikləri) bir-birilə sıx əməkdaşlıq etməli, vahid xətt üzrə əlbir işləməlidirlər.

Estetik tərbiyənin sisteminə ailədə və uşaq bağçasında estetik tərbiyə, məktəbdə təlim prosesində və sinifdən xaric tədbirlərdə, məktəbdənkənar tərbiyə müəssisələrində, habelə uşaq həyatının təşkilində, insan münasibətlərində estetik tərbiyə işləri daxildir.

Məktəbəqədər dövrdə estetik tərbiyə çox böyük əhəmiyyət kəsb edir. Estetik tərbiyənin bünövrəsi ailədə qoyulur. Ailə gözəlliyin, uşaq zövqünün ilk məktəbi, ana laylası uşaqların ilk melodiyasıdır. Ailədəki səliqə-sahman, təmizlik, uşaq oyuncaqları, ev avadanlığı və əşyalarının gözəlliyi, valideynlərin oxuduğu mahnı və şeirlər, danışdıqları nağıllar, təbiət gəzintiləri - bütün bunlar kiçik yaşlarda uşaq zövqünü formalaşdırır.

Estetik tərbiyə uşaq bağçasında daha sistemli xarakter kəsb edir. Uşaqlarla estetik məzmunlu məşğələlər - təbiətlə və ətraf aləmlə tanışlıq, musiqi, rəsm, gil, applikasiya, quraşdırma işləri, əmək məşğələləri aparılır, musiqili-didaktik oyunlar keçirilir, bayram və əyləncələr yüksək estetik formada təşkil edilir.

Məktəbdə estetik tərbiyə geniş məzmununda aparılır. Təlim prosesi estetik tərbiyənin çox mühüm vasitəsi olub, şagirdlərin estetik zövq və bacarıqlarının formalaşmasında böyük rol oynayır. Bu sahədə xüsusilə musiqi, təsviri incəsənət, əmək, ana dili və ədəbiyyat fənlərinin imkanları genişdir. Musiqi və nəğmə dərsləri estetik tərbiyənin qüdrətli vasitəsidir. Xüsusilə xorla oxunan mahnı zehni yorğunluğu götürür, xoş əhval aşılayır.

Təsviri incəsənət dərsləri də estetik tərbiyədə böyük əhəmiyyətə malikdir. Rəsm şagirdlərin bədii zövqünü, təxəyyülünü, yaradıcılıq qabiliyyətini inkişaf etdirir.

Estetik tərbiyədə ana dili və ədəbiyyat dərsləri də böyük imkanlara malikdir. Bədii nümunələr (şer, hekayə və nağıllar), bədii ədəbiyyat şagirdlərdə estetik hissləri, estetik zövq və mühakiməni inkişaf etdirir.

Estetik tərbiyə məqsədi ilə digər fənlərin də imkanlarından istifadə edilməlidir. Tədris etdiyi fəndən asılı olmayaraq müəllim öz gözəl nitqi, davranışı, münasibəti, geyimi ilə şagirdlərin zövqünü tərbiyə edir: "Hər bir fənn müəllimi estetik tərbiyə müəllimi olmalıdır" (M.Cəfər). Dərsdə istifadə olunan əyani vəsaitlər, sinfin estetik tərtibi, dərsdə yaradılan mənəvi-emosional mühit də estetik zövqün mühüm mənbəyini təşkil edir.

Dərslərdə aparılan estetik tərbiyə sinifdən xaric və məktəbdənkənar işlərdə daha da dərinləşdirilir və genişləndirilir. Bu işlər şagirdlərin maraqlarının və fərdi yaradıcılıq qabiliyyətlərinin inkişafına kömək göstərir. Estetik tərbiyə üzrə sinifdən xaric işlərin məzmunu, forması müxtəlif və rəngarəngdir. Bunları üç qrupa ayırmaq olar: dərək işləri, kütləvi işlər və fərdi işlər.

Bədii yaradıcılıq və incəsənət dərəkələri estetik tərbiyə üzrə sinifdən xaric işlərin geniş yayılmış formalarındandır. Belə dərəkələrə musiqi, xor, rəsm, rəqs, ədəbiyyat, dram, bədii oxu, bədii tikmə və b. dərəkələr daxildir.

Sinifdən xaric tədbirlərlə yanaşı, şagirdlər məktəbdənkənar müəssisələrdə uşaq və məktəblilər sarayları və evlərində, estetik tərbiyə mərkəzlərində, təsviri sənət studiyalarında müxtəlif növ yaradıcılıq fəaliyyətinə cəlb edirlər. Bir çoxları bu yolla öz gələcək həyat yolunu müəyyən edir, böyük sənətə vəsiqə alırlar.

Estetik tərbiyənin mühüm bir vasitəsi təbiət gözəllikləridir. Təbiət gözəllikləri mənbəyidir. O, estetik hisslərin, təxəyyülün inkişafına zəngin material verir. Təbiət ən yaxşı rəssamdır: "Xəyal həqiqi güldən daha yaxşı heç bir şey təsəvvür edə bilməz" (N.Çernişevski). Təbiət həm də tərbiyəçidir.

O, insanın aqlını və qəlbini zənginləşdirir, onda yüksək estetik və mənəvi hisslər - vətənpərvərlik, xeyirxahlıq, həssaslıq, doğma torpağa məhəbbət, ictimai hissləri oyadır. Bütün bunlar isə təbiətə, ətraf mühitə, insanlara estetik münasibətin formalaşmasına kömək edir.

Estetik tərbiyənin mühüm bir istiqaməti məişətdə, geyim və münasibətdə gözəllik ruhunda şagirdləri tərbiyə etməkdir. Onlar məktəbdə, ailədə, şəxsi həyatda gözəllik qanunları ilə yaşamağa, hər yerdə estetik mühit yaratmağa çalışmalıdırlar: gözəl danışmalı, gözəl geyinməli, gözəl yeriməli, gözəl davranmalıdırlar.

Burada müəllimin, valideynlərin nümunəsi, emosional mədəniyyəti böyük rol oynayır. Müəllimin daxili gözəlliyi, uşaqlarla ədalətli münasibəti, həssaslığı, pedaqoji məharəti, hər işdə ölçü hissini gözləməsi, düzlüyü, doğruluğu, mədəniliyi münasibət və davranış estetikasının çox təsirli vasitəsidir. Əgər uşaq ədalətsizliklə, təhqirlə qarşılaşmışsa, təşviş, qorxu, sıxıntı, ümitsizlik keçirsə, bu hisslər onun ürəyinə gözəllik yolunu sanki bağlayır. Bunu nəzərə alaraq, məktəbdə yüksək mədəni-psixoloji iqlim, həssaslıq və humanizm mühitinin yaranmasına nail olmaq lazımdır.

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КОГНИТИВНЫЕ И ЭМОЦИОНАЛЬНЫЕ БАРЬЕРЫ В ИЗУЧЕНИИ ИНОСТРАННЫХ ЯЗЫКОВ: ПУТИ ПРЕОДОЛЕНИЯ И МОТИВАЦИОННЫЕ СТРАТЕГИИ

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Аннотация: В статье рассматриваются ключевые факторы, влияющие на процесс изучения иностранных языков. Подробно анализируется их влияние на эффективность обучения, а также предложены практические методы преодоления барьеров. Отдельное внимание уделено роли современных технологий и приложений в повышении интереса и результатов изучения языков. Статья подчеркивает важность индивидуального подхода и применения инновационных инструментов в изучении иностранных языков.

Ключевые слова: изучение языков, стресс, тревожность, мотивация, когнитивные стили, методы обучения, современные технологии, языковые барьеры, индивидуальный подход.

Изучение иностранных языков — процесс многогранный, требующий не только интеллектуальных усилий, но и преодоления психологических барьеров. Когнитивные и эмоциональные аспекты играют ключевую роль в успешности обучения, формируя как преграды, так и возможности для личностного роста. Рассмотрим основные трудности, с которыми сталкиваются изучающие языки, а также эффективные подходы к их преодолению.

1. Когнитивные барьеры

Рабочая память играет центральную роль в усвоении нового материала. Однако её ограниченные ресурсы часто становятся препятствием. Например, изучающие могут запомнить грамматические правила, но испытывать сложности при их применении в устной речи. Необходимо использовать технику интервального повторения (spaced repetition), которая помогает распределить изучение материала во времени. Четко спланировать занятия: предложить короткие, но насыщенные сессии

Интерференция возникает, когда структуры родного языка мешают усвоению нового. Примером может служить использование неправильного порядка слов из-за привычек родного языка. Специалисты предлагают практику сознательной коррекции ошибок и осознанное изучение отличий в грамматике и фонетике двух языков.

Современный мир перенасыщен информацией, что снижает способность концентрироваться. Для изучающих это выражается в затруднениях при освоении новых слов или долгих текстов. Использование игровых методов, которые удерживают внимание и делают обучение интересным. Внедрение упражнений на развитие концентрации, например, чтение текстов с последующим пересказом. Все это может помочь в решении этой проблемы

2. Эмоциональные барьеры

Многие испытывают страх ошибок, особенно при разговоре с носителями языка. Это приводит к снижению уверенности и ограничивает прогресс. Создание благоприятной атмосферы на занятиях: поощрение, а не наказание за ошибки и постепенное увеличение сложности заданий, начиная с простых разговорных фраз могут помочь в преодолении языковой тревожности.

Долгий процесс обучения нередко приводит к выгоранию и снижению интереса. Мотивация — центральный фактор в успешном овладении языком. Она может быть **внутренней** (студент учит язык из-за личного интереса или удовольствия от процесса.) и **внешней** (стимулом являются внешние награды, такие как повышение по работе, сдача экзамена или путешествия).

Например: Ученик, который хочет переехать за границу (внешняя мотивация), может усилить интерес, изучая культуру этой страны через её язык (внутренняя мотивация). Чтобы достичь баланса необходимо четко поставить цели. Студенты могут терять связь между своими целями и изучением языка. Решением можно считать установление конкретных и достижимых целей: например, "выучить 50 новых слов за месяц" вместо абстрактного "выучить язык". Использование материалов, интересных студенту: фильмов, книг, подкастов. Некоторые учащиеся чувствуют себя некомфортно, когда их успехи сравнивают с успехами других, что вызывает стресс. Необходим индивидуальный подход в обучении и фокусировать внимание на личном прогрессе вместо сравнения с другими.

Обогащение словарного запаса связано с когнитивными процессами памяти, внимания и ассоциаций. Какие методы эффективны для увеличения словарного запаса с точки зрения психологии?

1. **Метод интервального повторения (Spaced Repetition)** - Этот подход предполагает повторение слов через увеличивающиеся интервалы времени, что способствует переносу информации из кратковременной в долгосрочную память. Например использование приложений, таких как Anki или Quizlet, которые автоматически планируют повторения.

2. **Создание ассоциаций** - Визуальные и контекстные связи помогают быстрее запоминать слова. Например, ассоциировать слово "apple" с образом яблока или сценой в саду.

3. **Эффект генерации** - Студенты запоминают лучше, если они активно используют слова в предложениях, а не просто заучивают их.

4. **Игра на эмоциях** - Эмоционально окрашенные слова запоминаются лучше. Например изучение слов через художественную литературу или фильмы, которые вызывают эмоциональную реакцию.

5. **Использование мнемонических приемов**. Мнемоника помогает связать новые слова с известной информацией через простые правила или образы. Упрощение и структурирование информации повышает её доступность для памяти. Можно создавать акронимы, рифмы или забавные истории. Например: для запоминания слов *cat* (кот) и *bat* (летучая мышь) можно придумать рифму: *The cat saw the bat*.

6. **Метод «10+1»** Каждое занятие включает 10 новых слов и 1 слово из предыдущих уроков для закрепления. Метод сочетает новизну и повторение. Учить 10 новых слов и использовать одно из предыдущих в разных предложениях.

Каждый человек имеет уникальный когнитивный стиль, который определяет его предпочтения в обучении.

1. **Визуальный стиль:** Люди с этим стилем лучше запоминают информацию через изображения, графики и диаграммы. Использование флэш-карт, инфографики или написание слов с иллюстрациями.

2. **Аудиальный стиль:** Эти учащиеся лучше воспринимают информацию через слух. Прослушивание подкастов, песен, аудиоуроков.

3. **Кинестетический стиль:** Предпочитают обучение через действия и практику. Ролевые игры, участие в разговорных клубах.

4. **Смешанный стиль:** Большинство людей используют комбинацию методов. Уроки, включающие аудирование, чтение, письмо и разговорную практику.

Современные технологии (приложения и платформы) влияют на мотивацию и результаты изучения языков. Технологии преобразовали изучение языков, делая его более доступным и увлекательным.

1. **Персонализация обучения:** Приложения, такие как Duolingo и Babbel, адаптируются под уровень и потребности пользователя. Duolingo использует игровые элементы, чтобы удерживать интерес.

2. **Доступ к аутентичным материалам:** YouTube, Netflix и подкасты предоставляют материалы на изучаемом языке. Просмотр фильмов с субтитрами улучшает понимание.

3. **Онлайн-коммуникация:** Платформы, такие как iTalki, Tandem, позволяют общаться с носителями языка. Разговор с носителем через видеозвонок развивает уверенность в общении.

4. **Геймификация:** Игровые элементы (очки, уровни, награды) делают обучение интересным. В приложениях создаются серии (streaks), которые мотивируют заниматься ежедневно.

Эффективное изучение иностранных языков представляет собой сложный процесс, который требует гармоничного учета когнитивных и эмоциональных факторов, а также индивидуальных особенностей учащихся. Понимание влияния стресса и тревожности, использование мотивационных стратегий и учет когнитивных стилей помогают создавать персонализированный подход к обучению.

Современные технологии играют важную роль, предоставляя интерактивные инструменты, которые делают обучение более доступным, интересным и продуктивным. Применение таких методов позволяет преодолевать языковые барьеры, укреплять уверенность в своих силах и достигать значительных результатов в овладении языком.

Кроме того, изучение иностранных языков способствует развитию когнитивных способностей, таких как память, креативное мышление и умение анализировать информацию. Это процесс, который не только расширяет возможности коммуникации, но и способствует культурному обогащению личности, позволяя лучше понимать традиции и мировоззрение других народов.

В условиях глобализации владение иностранными языками становится не просто полезным навыком, но и необходимостью, которая открывает новые перспективы в образовании, карьере и личностном развитии. Поэтому внедрение современных подходов к обучению становится важной задачей как для преподавателей, так и для самих учащихся, стремящихся к успеху.

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Economic Sciences

Using a customer-centric approach in modern organizational management: A case study of Chinese online stores

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Introduction

Research background

Importance of modern organizational management : Modern organizational management plays a vital role in the rapidly changing business environment. With the acceleration of globalization and digitalization, enterprises are facing increasingly fierce competition and changing market demands. Effective organizational management can not only improve the operational efficiency of enterprises, but also enhance their ability to adapt to market changes. In this context, modern organizational management emphasizes flexibility, innovation and customer-centricity, aiming to achieve sustainable development by optimizing resource allocation and improving decision-making efficiency.

In China, with the rapid economic development and changes in consumer behavior, traditional management models can no longer meet market demand. Enterprises need to use modern management methods to improve internal collaboration and strengthen external communication to better respond to market challenges. This transformation has prompted companies to continuously explore new management concepts, especially customer-centric methods, which have become an important part of modern organizational management.

The concept and development of customer-centricity : The concept of customer-centricity originated from the field of marketing, emphasizing that enterprises should focus on customer needs and experience in product design, service provision and market strategy. With the diversification of consumer choices and the convenience of information acquisition, customer expectations and needs are constantly changing, which requires companies to pay more attention to the voice of customers.

In the context of online stores in China, customer-centric approaches have been widely applied and developed. Many companies use data analysis, user feedback and market research to gain a deep understanding of customer needs and preferences, thereby optimizing products and services. For example, e-commerce platforms improve user experience and enhance customer stickiness through personalized recommendations, precision marketing and high-quality customer service.

In recent years, with the advancement of technology, customer-centric approaches have also been evolving. The application of emerging technologies such as artificial intelligence, big data and cloud computing has enabled companies to collect and analyze customer data more efficiently, driving intelligent and precise decision-making. This transformation has not only improved customer satisfaction, but also created greater business value for companies.

2. Research objectives

Analyze the application of customer-centric approach in Chinese online stores , and reveal how enterprises can optimize business processes and improve user experience through customer feedback and market research by analyzing how different types of online stores implement this approach, including product development, marketing, customer service, etc. In addition, the study will also focus on the role of technology in this process, such as how tools such as big data analysis, artificial intelligence and social media can help companies better understand customer needs and behaviors.

Through case analysis and empirical research, this paper will summarize the key factors for the successful implementation of a customer-centric approach and propose best practices that other online stores can learn from. This will provide relevant companies with effective management strategies and innovative ideas in a highly competitive market environment.

this study is to evaluate the impact of the customer-centric approach on the performance of Chinese online stores. Through quantitative and qualitative analysis, this study explores how this approach can produce positive results in terms of improving customer satisfaction, increasing customer loyalty, promoting sales growth, and improving brand image.

Specifically, the study will collect and analyze relevant data to evaluate the changes in market share, revenue growth, customer retention, etc. after the implementation of the customer-centric strategy. At the same time, the study will also consider the impact of external environmental factors on corporate performance to ensure the comprehensiveness and accuracy of the evaluation results.

Through a systematic analysis of the application of customer-centric approach in Chinese online stores and its impact on business performance, this study aims to provide practical insights and suggestions for business managers to help them achieve sustainable development in the modern business environment.

Literature Review

Customer-centric theory

Definition and basic principles : Customer-centric theory is a management philosophy that emphasizes that companies should give priority to customer needs and expectations in all decisions and activities. Its basic principles include:

Customer demand orientation: Companies should gain a deep understanding of customer needs and preferences through market research and customer feedback to guide product development and service design.

Personalized service: Provide personalized products and services based on the characteristics of different customers to enhance customer experience and satisfaction.

Continuous interaction: Maintain continuous communication and interaction with customers, and respond to customer feedback and suggestions in a timely manner to enhance customer engagement and loyalty.

Value creation: Create added value by providing products and services that exceed customer expectations, thereby enhancing the overall customer experience.

Development History and Global Perspective :

The customer-centric theory originated from marketing in the early 20th century. With the intensification of market competition and the improvement of consumer rights awareness, this theory has gradually developed and matured. In the 1980s, the rise of service marketing led to the widespread application of the customer-centric concept, and many companies began to pay attention to customer relationship management (CRM) and customer experience management (CEM).

Customer-centric approaches have been successfully implemented in various industries around the world. For example, Amazon has set a customer-centric benchmark through personalized recommendations and efficient customer service; Apple has achieved commercial success through excellent user experience and brand loyalty. These cases show that customer-centric approaches can not only improve customer satisfaction, but also promote innovation and growth of enterprises.

2. Current status of online stores in China

Market size and major players : In recent years, China's online store market has developed rapidly and has become the world's largest e-commerce market. According to statistics, the scale of China's e-commerce market in 2023 has exceeded 40 trillion yuan, covering a variety of forms from comprehensive e-commerce platforms to vertical market segments. Major players include Alibaba, JD.com, Pinduoduo, etc. These platforms have attracted a large number of consumers through continuous innovation and optimization of user experience.

In addition, with the popularization of mobile Internet and the rise of social media, new models such as live e-commerce and social e-commerce have also risen rapidly, becoming an important driving force for market growth. This phenomenon shows that consumers' shopping habits are changing, and companies must respond flexibly to meet the changing market demands.

Current challenges and opportunities : Although the Chinese online store market has broad prospects, enterprises also face many challenges in the process of development. First, market competition is becoming increasingly fierce, and price wars and promotions are frequent, which squeezes profit margins. Second, consumer demand is becoming more diversified and personalized, requiring enterprises to continue to innovate to maintain competitiveness. In addition, data security and privacy protection issues are also receiving increasing attention, and enterprises need to strengthen technical and management measures to maintain customer trust.

However, challenges also contain opportunities. With the continuous advancement of science and technology, the application of new technologies such as artificial intelligence, big data and cloud computing has provided enterprises with more efficient operation methods and decision-making support. Through precision marketing and personalized services, enterprises can better meet customer needs and improve customer experience, thereby gaining an advantage in the competition.

Customer-centric methodology

Collection and analysis of customer data

Data Type and Source

In the customer-centric approach, the collection and analysis of customer data is fundamental. The data types mainly include:

Quantitative data: such as sales data, visits, conversion rates, etc. These data are usually obtained through the backend system of the e-commerce platform.

Qualitative data: Such as customer feedback, reviews, and surveys. This data can be obtained through social media, online surveys, or customer service interactions.

Behavioral data: includes users' browsing behavior, purchase paths, and dwell time on the website, which are collected through website analysis tools.

The data sources mainly include the e-commerce platform's own transaction records, user registration information, social media interactions, and data from third-party market research agencies.

Analytical Tools and Techniques

To effectively analyze customer data, companies can use a variety of tools and techniques:

Data analysis software: such as Excel, Tableau, and Power BI, for data visualization and trend analysis.

Big data technologies: such as Hadoop and Spark, process massive amounts of data and extract valuable information.

Machine learning algorithms: used to predict customer behavior and needs, such as recommendation systems and classification algorithms.

Customer Relationship Management (CRM) system: Integrates customer data, provides a comprehensive customer view, and supports personalized communication and service.

Through these tools and technologies, companies can gain a deeper understanding of customer needs and preferences, thereby developing more effective marketing strategies.

Customer Experience Design

User interface and user experience optimization

Optimizing the user interface (UI) and user experience (UX) is key to improving customer satisfaction. Companies should focus on the following aspects:

Interface design: Make sure the interface of your website or app is beautiful, simple, easy to navigate, and can quickly guide users to find the information they need.

Loading speed: Improve page loading speed and reduce user waiting time to reduce bounce rate.

Mobile optimization: With the popularity of mobile shopping, ensure the adaptability and usability of the website on mobile phones and tablets.

Through user testing and feedback, we continuously iterate and optimize the design to enhance the overall user experience.

Personalized recommendations and customized services

Personalized recommendations are an important means of achieving customer-centricity. Companies can provide personalized product recommendations and customized services based on customers' historical behaviors and preferences:

Recommendation algorithm: Use machine learning algorithms to analyze customers' purchase history and browsing behavior to provide accurate product recommendations.

Customization options: Allow customers to customize products based on their personal preferences, such as color, size, and features, to increase customer engagement and satisfaction.

Personalized services not only enhance customer experience, but also increase customer purchase intention, thereby driving sales growth.

3. Customer Relationship Management

Customer Service Strategy

An effective customer service strategy is a core component of customer-centricity. Businesses can take the following measures:

Multi-channel service: Provide multiple service channels such as telephone, online chat, social media, etc. to meet the needs of different customers.

Response time: Ensure quick response to customer inquiries and complaints to improve customer satisfaction and loyalty.

Train customer service staff: Improve the professional knowledge and communication skills of customer service staff to better solve customer problems.

By establishing an efficient customer service system, companies can enhance customer trust and satisfaction.

Feedback and communication mechanism

Establishing an effective feedback and communication mechanism is an important part of continuously improving customer experience. Companies should:

Regular surveys: Regularly collect customer feedback through questionnaires, satisfaction assessments, etc. to understand customer needs and expectations.

Social media interaction: Actively interact with customers on social media, listen to their voices, and respond to their opinions and suggestions in a timely manner.

Feedback analysis: Systematically analyze the collected feedback to identify problems and improvement points so that products and services can be adjusted in a timely manner.

By establishing a good feedback and communication mechanism, companies can continuously optimize customer experience, enhance customer loyalty, and ultimately achieve sustainable development.

Case Analysis

1. Select typical Chinese online stores

Taobao: As a C2C platform under Alibaba Group, Taobao is famous for its rich product variety and flexible transaction methods, attracting a large number of small and medium-sized sellers and consumers.

JD.com: Mainly self-operated e-commerce, JD.com has obvious advantages in logistics and customer service, and emphasizes fast delivery and authenticity guarantee.

Pinduoduo: It has risen rapidly through the social group buying model, attracting a large number of users with low prices and group buying promotions, and its performance is particularly outstanding in the sinking market.

2. Customer-centric practices:

Strategy implementation process

Taobao:

User experience optimization: Taobao continues to optimize the user interface, simplify the shopping process, and improve user experience through personalized recommendations.

Community interaction: Enhance user interaction through live broadcasts, short videos, etc., encourage users to share their shopping experiences, and improve platform stickiness.

JD.com:

Logistics innovation: JD.com has established a nationwide logistics network, achieving next-day and same-day delivery through "JD.com Delivery", enhancing customer satisfaction.

After-sales service: Provide worry-free return and exchange service to enhance consumers' purchasing confidence and establish good customer relationships.

Pinduoduo:

Social marketing: Attract users through group buying, encourage users to share links, increase user participation and willingness to buy.

Pricing strategy: Attract consumers with low prices, while optimizing supply chain management through big data analysis to ensure product quality.

Effectiveness evaluation and customer feedback

Taobao:

Effectiveness evaluation: According to data, the number of Taobao's active users continues to grow, user stickiness increases, and transaction volume increases year by year.

Customer feedback: Users generally reported a good shopping experience, and were particularly satisfied with personalized recommendations and community interactions. However, some users also reported that the quality of some products varied.

JD.com:

Effectiveness evaluation: JD.com performed well in the customer satisfaction survey, with high scores in logistics services and after-sales services, and a significant increase in user repurchase rate.

Customer feedback: Users highly recognize JD.com's delivery speed and authenticity guarantee, but they also hope to have more choices in product variety and price.

Pinduoduo:

Effectiveness evaluation: The number of Pinduoduo users has grown rapidly, especially in second- and third-tier cities, and its market share has continued to expand.

Customer feedback: Users are satisfied with the low-priced goods, but their opinions on product

quality and after-sales service are quite mixed. Some users hope that the platform can strengthen its management of merchants.

Through the case analysis of these three platforms, it can be seen that the customer-centric approach has played a vital role in the successful practice of Chinese online stores. These platforms have achieved remarkable results by continuously optimizing customer experience, building good customer relationships and flexibly responding to market changes.

Implementation	Effects	and	Impacts
1. Improved customer satisfaction and loyalty			
Indicator Analysis			
After implementing a customer-centric approach, customer satisfaction and loyalty have significantly improved, as reflected in the following indicators:			
Customer satisfaction survey: According to user satisfaction surveys of major e-commerce platforms, satisfaction rates are generally above 80%, with high scores in logistics, after-sales service and product quality.			
Net Promoter Score (NPS): Many platforms have seen an increase in NPS scores, indicating that users are willing to recommend these platforms to others, reflecting high customer loyalty.			
Repurchase rate: The increase in repurchase rate is an important reflection of customer loyalty. Data shows that after implementing a customer-centric strategy, the repurchase rate generally increased by 15%-30%.			
Through the analysis of these indicators, it can be seen that the improvement of customer experience directly promotes the improvement of customer satisfaction and loyalty.			
2. Sales growth and market competitiveness			
Performance comparison			
The customer-centric methodology not only improves customer satisfaction, but also directly drives sales growth and market competitiveness:			
Sales growth: After implementing customer-centric strategies, Taobao, JD.com, and Pinduoduo all achieved annual sales growth of 20%-40%, especially during promotional events such as "Double Eleven", when sales hit new highs.			
Changes in market share: According to data from market research institutions, Taobao and JD.com maintained stable market share, while Pinduoduo grew rapidly and successfully captured a large amount of low-price market share.			
Improved competitiveness: Customer-centric strategies have given these platforms a clear advantage in the competition. Improved user reviews and market reputation have strengthened the brand's market position.			
These performance comparisons clearly demonstrate that the customer-centric implementation strategy effectively drives sales growth and market competitiveness.			
3. Optimize internal management of the organization			
Cross-departmental collaboration and process improvement			
The customer-centric approach not only affects external market performance, but also promotes the optimization of internal management of the organization, which is mainly reflected in the following aspects:			
Cross-departmental collaboration: In order to better meet customer needs, the collaboration between departments has become closer. For example, product development, marketing and customer service teams hold regular meetings to jointly analyze customer feedback and quickly respond to market changes.			
Process improvement: By paying attention to customer feedback, companies have optimized their internal processes. For example, at JD.com, the logistics and after-sales service processes have been integrated, improving processing efficiency and shortening customer waiting time.			

Data-driven decision-making: Data analysis tools are widely used within companies, using customer data to guide product development and market strategies, making decisions more scientific and precise.

These internal management optimizations not only improve work efficiency, but also enhance the organization's flexibility and responsiveness, enabling companies to better adapt to market changes and customer needs.

By implementing a customer-centric approach, Chinese online stores have achieved significant results and impacts in terms of customer satisfaction and loyalty, sales growth and market competitiveness, and internal organizational management optimization.

Challenges and Solutions

1. Data privacy and security issues

Regulation and Compliance

In a customer-centric business model, data privacy and security issues are becoming increasingly prominent. With the implementation of data protection regulations (such as the Personal Information Protection Law), companies need to ensure that their data processing activities comply with relevant legal requirements.

Solution:

Strengthen data protection measures: Companies should establish sound data protection policies and adopt encryption technology and access control to ensure the security of customer data.

Compliance review: Conduct compliance reviews regularly to ensure that all data processing activities comply with local regulations and avoid legal risks caused by violations.

User transparency: Enhance communication with customers, clearly inform customers of the purpose and use of data collection, and obtain users' informed consent to increase customer trust.

2. Diversification and complexity of customer needs

Flexible response strategies

As consumer preferences change and customer needs become more diverse and complex, companies are faced with the challenge of how to respond quickly to market changes.

Solution:

Market research and customer feedback: Conduct market research regularly, collect customer feedback, and adjust products and services in a timely manner to meet changing customer needs.

Personalized services: Use big data and artificial intelligence technologies to provide personalized recommendations and customized services to enhance customer experience and satisfaction.

Agile development: Adopt agile development methods to quickly iterate products and services to ensure rapid response to market and customer changes.

3. Technology update and resource allocation

The need for investment and training

The rapid development of technology requires companies to constantly update their technology infrastructure and business processes to remain competitive. However, this also brings pressure on investment costs and employee training.

Solution:

Reasonable technology investment: Enterprises should formulate long-term technology investment plans and give priority to investing in technologies that can directly improve customer experience and operational efficiency.

Employee training and skills improvement: Regularly provide technical training to employees to improve their ability to master new technologies and ensure that the team can effectively use new tools and systems.

Cooperation and outsourcing: For some areas with high technological requirements, enterprises can consider cooperating with professional companies or outsourcing to reduce the cost and risk of technological updates.

With effective solutions to the above challenges, companies can better implement a customer-centric approach, improve their competitiveness, and continue to grow in a dynamic market environment.

Future Development Trends

1. Application of new technologies in a customer-centric approach

AI, Big Data and Automation

In the future e-commerce environment, AI, big data and automation technologies will continue to play an important role in driving customer-centric approaches to a higher level.

Artificial Intelligence (AI): AI will be widely used in customer service and personalized marketing. Through natural language processing and machine learning, companies can implement intelligent customer service, quickly respond to customer inquiries, and provide personalized shopping suggestions. For example, chatbots can provide support to customers around the clock and improve customer satisfaction.

Big data analysis: Companies will use big data technology to deeply analyze customer behavior and preferences and identify potential market opportunities. Through data-driven decision-making, companies can formulate marketing strategies more accurately, optimize product portfolios, and meet customers' personalized needs.

Automated processes: Automation technology will simplify and accelerate processes such as order processing, inventory management, and customer service, improving operational efficiency. Through automation, companies can reduce human errors and improve customer experience.

2. Strategies to continuously optimize customer experience

Future market forecast and changes

As consumer expectations continue to rise, businesses need to continually optimize the customer experience to maintain a competitive advantage.

Omnichannel experience: In the future, consumers will pay more attention to seamless omnichannel shopping experience. Companies need to integrate online and offline channels to ensure that customers get a consistent brand experience on different platforms. For example, customers can order online and choose to pick up in the physical store, or choose to buy online after experiencing it in the physical store.

Augmented reality (AR) and virtual reality (VR): AR and VR technologies will provide customers with a more immersive shopping experience, especially in the fields of clothing and home furnishings. Customers can experience the product effects in advance through virtual fitting rooms or home furnishing placement tools, thereby increasing their confidence in purchasing decisions.

Sustainable development and social responsibility: Future consumers are increasingly concerned about brand sustainability and social responsibility. Companies need to integrate sustainable development into customer experience, attract customers and enhance brand image through environmentally friendly packaging, green products and social responsibility projects.

Through the analysis of the above trends, it can be seen that future e-commerce will rely more on the application of new technologies and the continuous optimization of customer experience. Enterprises must keep up with market changes and flexibly adjust strategies to meet changing customer needs and maintain competitiveness.

Conclusion

1. Research Summary

The key role of a customer-centric approach

In modern organizational management, a customer-centric approach has become an important strategy to enhance corporate competitiveness. Through research on Chinese online stores, we found that a customer-centric approach plays a key role in many aspects:

Improved customer satisfaction and loyalty: Implementing a customer-centric strategy can effectively improve customer satisfaction and loyalty, thereby enhancing the company's market share and brand influence.

Sales growth and market competitiveness: The company has achieved significant sales growth and improved its market competitiveness by meeting customer needs and optimizing products and services.

Internal management optimization: The customer-centric approach promotes cross-departmental collaboration and process improvement within the organization, thereby improving the company's operational efficiency.

A customer-centric approach is not only an effective means to enhance customer experience, but also an important driving force for sustainable development of enterprises.

2. Suggestions for Chinese online stores

Implementation strategies and future prospects

The following suggestions are put forward for the future development of online stores in China:

Deepen data analysis capabilities: Companies should further strengthen their data analysis capabilities, use big data and AI technologies to gain a deeper understanding of customer needs, and adjust products and services in a timely manner to adapt to market changes.

Improve omni-channel integration capabilities: It is recommended that companies build a seamless omni-channel shopping experience to ensure consistency and convenience for customers on different platforms, thereby enhancing customer stickiness.

Focus on sustainable development: In product design, packaging and logistics, companies should focus on sustainability, respond to consumers' concerns about environmental protection and social responsibility, and enhance their brand image.

In the future, when implementing customer-centric strategies, Chinese online stores should flexibly respond to market changes and continuously optimize customer experience to maintain their competitive advantage and market position. By continuously innovating and improving service quality, enterprises will be able to remain invincible in the fierce market competition.

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The procedure for creating provisions in accordance with IFRS 9 in second-tier banks of Kazakhstan

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Abstract

One of the key factors for the stability and reliability of second-tier banks (STBs) is the creation of provisions to cover credit losses. In the context of current economic realities and the influence of global financial changes, the need for accurate assessment and creation of reserves has become increasingly relevant. This article examines the procedure for creating provisions in accordance with IFRS 9, emphasizing its significance in enhancing trust in Kazakhstan's banking system.

Keywords: assets, provisions, credit risk, IFRS 9, second-tier banks, economic conditions of 2024.

The creation of necessary provisions is critically important for ensuring the financial stability of banks. Provisions serve as a financial buffer that helps banks cope with potential credit losses and maintain the confidence of investors and clients. In the context of an unstable economic situation, driven by economic fluctuations and global financial challenges, banks must pay special attention to the procedure for creating provisions.

International Financial Reporting Standards, such as IFRS 9, introduce new requirements for the accounting and assessment of credit risks. These changes demand a more proactive approach to provisioning from banks, which can significantly impact their financial reporting. This article addresses current issues related to the creation of provisions in accordance with IFRS 9, analyzes their influence on the financial stability of banks, and assesses the potential risks associated with lending activities.

IFRS 9 "Financial Instruments" came into effect on January 1, 2018, and represents a crucial step in reforming the approaches to accounting for financial instruments, particularly in the area of credit loss accounting. This standard replaced the previous incurred loss model under IAS 39 with a new model based on expected credit losses (ECL). In its 2021 update, IFRS 9 continues to emphasize the need for banks and financial institutions to take a forward-looking approach to assessing and recognizing credit losses, ensuring that provisions for credit risks are more responsive to changing economic conditions. The standard also enhances transparency by requiring more detailed disclosures about credit risk management, helping stakeholders better understand how financial institutions are addressing the risks associated with their financial instruments [1,2].

These improvements aim to ensure that credit losses are recognized earlier and more comprehensively, reducing the risk of under-provisioning during periods of economic downturns, and thus contributing to greater financial stability in the banking system.

The expected credit loss (ECL) model is a key element of IFRS 9 and requires banks to assess and recognize impairment reserves based on expected losses rather than just actual losses. This

change in approach allows for more effective management of credit risks and enables banks to better prepare for potential financial difficulties. The fundamental principles of the ECL model are based on the premise that reserves should reflect not only current losses but also all possible future losses. Expected credit losses represent a weighted average of all potential losses, weighted by probability, which considers not only historical data but also future economic forecasts, making the assessment more flexible and realistic. Risk forecasting requires banks to assess the impact of various factors on credit risks, such as macroeconomic conditions, changes in legislation, and market trends, which may include the use of scenario analysis and stress testing.

As of January 1, 2024, according to the reporting of the National Bank of Kazakhstan, the share of provisions in the loan portfolio in the banking sector averaged around 17% of the total volume of loans. This increase from 15% in 2023 indicates that banks are becoming more conservative in their risk assessments. For instance, Bank A recorded reserves of 25 billion tenge, which constitutes 20% of its loan portfolio of 125 billion tenge. Expected credit losses for 2024 were estimated at 30 billion tenge, which is 10% higher compared to 2023, indicating that the bank is actively analyzing its credit risks and taking measures to minimize them [3].

In 2024, Kazakhstan faces several economic challenges, including inflationary pressures and currency market instability. Forecasts suggest that the unemployment rate may rise to 6% in 2024, directly impacting borrowers' ability to meet their obligations. This underscores the importance of the ECL model in managing credit risks. In the context of anticipated economic downturns, banks expect an increase in credit losses. A study conducted at the beginning of 2024 predicts that the overall level of credit losses in the banking sector could rise by 15-20% compared to previous years, further emphasizing the necessity of having adequate reserves [4].

Table 1: Three-Stage Impairment Model under IFRS 9 [4].

Stage	Description	Risk Level	Reserve Calculation	Example
Stage 1	Assess expected credit losses (ECL) over the next 12 months for financial assets that do not show signs of impairment.	Low risk (assets considered less risky)	Based on short-term forecasts for the next 12 months.	If a loan portfolio is worth 100 billion tenges, and 1% may become problematic, the reserve would be 1 billion tenges.
Stage 2	Activated when a credit asset shows significant deterioration in creditworthiness but is not yet impaired. Reserves are based on expected credit losses over the asset's lifetime.	Higher risk (deteriorating creditworthiness)	Based on lifetime expected credit losses, considering the borrower's financial condition.	If an asset worth 50 billion tenges shows signs of deterioration, and expected losses over its 5-year lifetime are 10%, the reserve would be 5 billion tenges.
Stage 3	Applies when an asset is impaired. Reserves are calculated over the lifetime of the asset, including full recognition of reserves for problematic loans.	High risk (impaired assets)	Based on lifetime expected losses, including future losses.	If a loan of 30 billion tenges is impaired and expected losses are 70%, the reserve would be 21 billion tenges.

Thus, the expected credit loss (ECL) model under IFRS 9 is an important tool for assessing and managing credit risks in 2024. It allows banks to more accurately forecast potential losses and take proactive measures to minimize them. Considering the current economic realities, banks must continue to adapt to new conditions and refine their approaches to creating impairment reserves to ensure financial stability and protect the interests of all their counterparties.

In accordance with IFRS 9, banks must apply a three-stage system for assessing and accounting for credit losses. This model allows for a more precise and adequate reflection of the condition of assets and risks associated with lending, and it clarifies the provisioning process. Each stage defines different levels of assessment and approaches to provisioning, which is an important aspect of the financial stability of banks.

Stage 1 involves assessing expected credit losses (ECL) over the next 12 months for financial assets that do not show signs of impairment. At this stage, assets are considered less risky, and reserves are created based on short-term forecasts. For example, if a bank has a loan portfolio amounting to 100 billion tenges and expects that 1% of this portfolio may become problematic within the next year, the impairment reserve would amount to 1 billion tenges. This stage applies to most loans that are classified as standard and for which there is no information indicating a deterioration in the borrowers' creditworthiness [5].

Stage 2 is activated when a credit asset demonstrates a significant deterioration in creditworthiness but is not yet considered impaired. In this case, banks must calculate reserves based on expected credit losses over the lifetime of the asset. This requires a thorough assessment of the borrower's financial condition and analysis of factors that may affect their ability to repay the loan. For instance, if an asset worth 50 billion tenges shows signs of deterioration, and the bank expects that during its lifetime (for example, 5 years), the possible credit losses will amount to 10% of the loan amount, the reserve will be 5 billion tenges.

Stage 3 is applied when an asset is considered impaired. At this stage, expected losses must be calculated over the lifetime of the asset, which includes full recognition of reserves for problematic loans. In this case, banks must account for not only current losses but also future ones, based on the borrower's financial condition and expected cash flows. For example, if a bank has a loan of 30 billion tenges that has become problematic and the borrower cannot fulfill their obligations, the bank may estimate that expected losses will amount to 70% of the loan amount. In this case, the impairment reserve will be 21 billion tenges.

This three-stage impairment model within IFRS 9 provides banks with a clear and structured approach to managing credit risks, contributing to more reliable provisioning and enhancing the financial stability of the banking sector as a whole.

The three-stage system within IFRS 9 allows banks to transparently and accurately account for credit risks, which in turn significantly affects financial reporting. Each bank is required to closely monitor changes in the quality of its assets and timely revise its reserve estimates [6]. This constant attention to the condition of assets enables a more accurate reflection of current and potential risks in financial reporting.

The application of this model requires banks to systematically monitor their credit portfolios. This not only aids in risk management but also prevents potential losses. Regular assessment of the condition of assets and corresponding reserves is essential for maintaining the financial stability and reliability of the bank.

According to the National Bank of Kazakhstan, in 2023, approximately 12% of the assets of second-tier banks were classified as Stage 2, indicating a rise in problematic loans amidst economic instability. This statistic underscores the importance of adequate provisioning at all stages of impairment. When a significant portion of assets may demonstrate a deterioration in creditworthiness, banks must promptly adjust their reserve estimates to avoid further financial losses.

The three-stage impairment model introduced in IFRS 9 provides a deeper and more proactive approach to assessing credit losses. It enables banks not only to manage risks more effectively but also to enhance the reliability of their financial reports. This is especially critical in an environment of increasing economic uncertainty, where a bank's ability to accurately assess and respond to credit risks directly influences its financial stability and the trust of clients and investors.

The introduction of the expected credit loss (ECL) model under IFRS 9 has had a significant impact on the financial reporting of banks, altering the approach to risk assessment and provisioning. The ECL system requires banks to adopt a stricter and more proactive stance on credit risk management, which is reflected in their financial statements [7].

One key aspect of this impact is the increase in reserves for asset impairment. According to an analysis conducted by the National Bank of Kazakhstan, the average level of reserves for asset impairment in 2023 rose by 20% compared to the previous year. This indicates a more conservative approach by banks to assessing credit risks and a determination to account for potential losses before they materialize. For instance, if the total volume of reserves in 2022 was 1 trillion tenges, it increased to 1.2 trillion tenges in 2023, reflecting the necessity to adapt to new economic realities and risks.

The share of provisions in the loan portfolio also demonstrates significant changes. Reports from several second-tier banks indicate that the share of provisions in the loan portfolio in 2023 accounted for about 15% of the total volume of loans. This is a testament to a more stringent approach to provisioning amidst instability in financial markets. For example, Bank B reported that as of January 1, 2024, provisions for its loan portfolio amounted to 18 billion tenges, which corresponds to 15% of its total loan portfolio of 120 billion tenges. This level of provisioning indicates an awareness of risks associated with potential loan defaults.

Thus, the implementation of the ECL model not only enhances the accuracy of credit risk assessments but also contributes to increased reliability of banks' financial reports, which is a vital factor in maintaining trust among clients and investors during economic instability [8].

As reserves for impairment increase, the profitability of banks may temporarily decline, as funds that could be used for lending or other investments are now reserved to cover potential losses. This leads to a reduction in dividends for shareholders and may lower the market capitalization of banks, negatively impacting their attractiveness to investors.

Financial indicators in the 2023 reports show that many banks noted a decrease in net profit by 10-15% compared to previous periods. This decline is associated with the necessity to create larger impairment reserves, reflecting a more conservative approach to credit risk assessment in an environment of economic uncertainty. For example, Bank C reported a decrease in net profit to 5 billion tenges, which is 12% less than in 2022, due to an increase in reserves to 10 billion tenges.

In conclusion, the application of IFRS 9 and the ECL model significantly influences the provisioning practices of banks in Kazakhstan, highlighting the need for proactive risk management and a strong focus on financial stability amidst ongoing economic challenges.

The implementation of the expected credit loss (ECL) model significantly enhances the transparency of financial reporting among banks. Investors and counterparties gain more accurate and timely information regarding credit risks and the level of provisioning. This transparency boosts confidence in financial statements and strengthens the reputation of banks, particularly in times of instability in the financial markets [9].

As of the end of 2023, the overall picture indicates that the level of non-performing loans in second-tier banks stands at 85%. This figure is a positive signal regarding the stability of the loan portfolio but requires continuous monitoring and risk assessment. For instance, Bank D reported a rate of 90% non-performing loans, underscoring its resilience while also highlighting the need for a careful approach to asset and reserve management.

Thus, the introduction of the ECL model not only alters the structure of provisioning and risk management but also significantly impacts the financial results of banks. This approach allows institutions to more accurately reflect the condition of their loan portfolios, which, in turn, enhances transparency and trust from clients and investors.

The ECL model fundamentally changes how banks manage credit risks and form provisions. It requires financial institutions to adopt a more proactive and stringent approach to assessing potential losses, which consequently leads to increased impairment reserves and a growing share of provisions in the loan portfolio. These changes reflect a more conservative approach to risk assessment, which is essential in an unstable economic environment [10].

However, despite these positive aspects, the increase in reserves may negatively affect the profitability of banks by reducing their income and dividends for shareholders. Therefore, it is crucial for banks to enhance their transparency and accountability in financial reporting by providing relevant and reliable information about their credit risks and provisioning practices.

In the context of uncertainty in financial markets, such measures are vital for ensuring the stability of the banking sector. Effective management of credit risks and adequate provisioning not only contribute to maintaining financial stability but also enhance confidence among clients and

investors in the banking system as a whole. Consequently, the implementation of the expected credit loss model represents an important step toward improving the financial resilience of banks and strengthening their role in the economy.

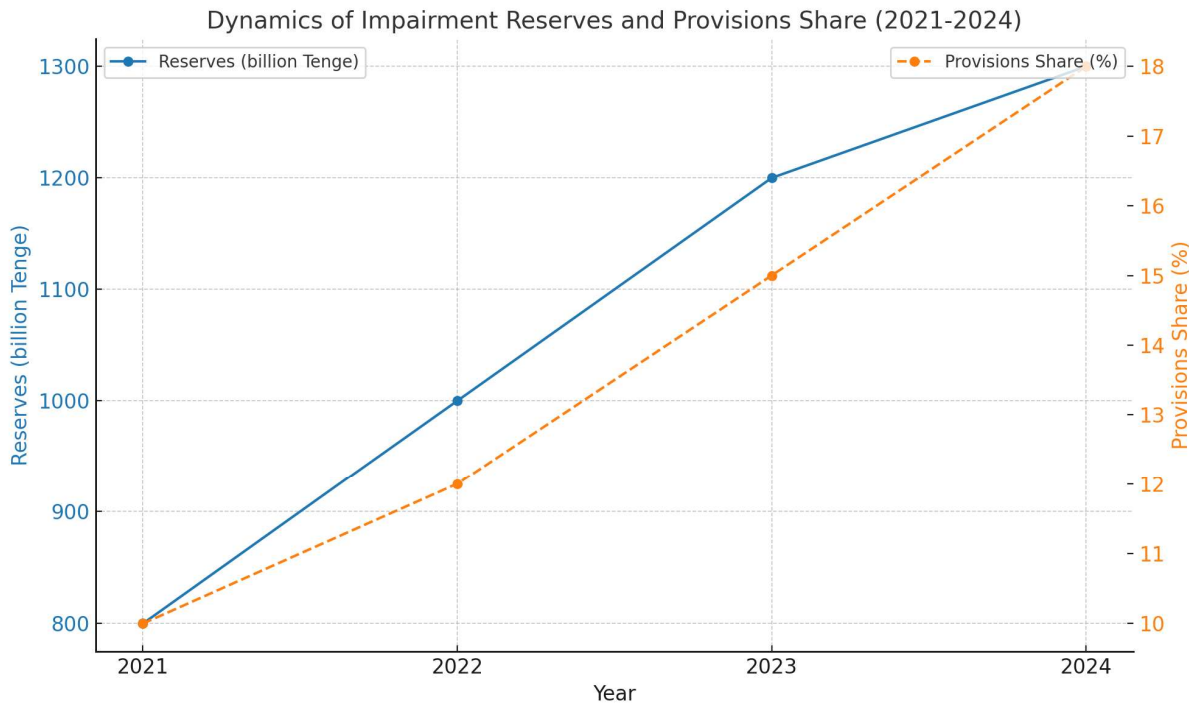


Figure 1. Dynamics of Impairment Reserves and Share of Provisions in the Loan Portfolio of Second-Tier Banks in Kazakhstan (2021-2024) [10].

Here is the graph showing the dynamics of impairment reserves and the share of provisions in the loan portfolio of second-tier banks in Kazakhstan from 2021 to 2024. The blue line represents the reserves for impairment in billion tenges, while the orange line indicates the share of provisions in percentage terms [10].

For the successful implementation of IFRS 9, banks must actively invest in modern technologies and accounting systems that ensure real-time updates of credit risk data. The implementation of such solutions includes integrating risk management systems with accounting and reporting platforms, which guarantees the relevance of information and allows for prompt responses to changes in loan portfolios. According to an analysis conducted by the National Bank of Kazakhstan, more than 60% of second-tier banks have already started using analytical platforms based on artificial intelligence and machine learning to predict the likelihood of credit losses. These technologies not only assist in risk forecasting but also enable real-time monitoring of credit risks.

Employee training should also be a significant priority for banks. Training staff in new methods for assessing credit losses and managing risks is essential to ensure a high level of expertise among specialists. This includes technical training on using new technologies and developing analytical thinking skills, which contribute to more accurate assessments of credit risks. Research indicates that investments in employee training lead to improved decision-making quality, which can reduce credit losses by 15-20%.

Regular seminars and training sessions, where employees can learn best practices in risk management and financial data analysis, are becoming essential. Given the changes introduced by IFRS 9, training should cover all aspects of the new model to ensure compliance with requirements and enhance overall effectiveness in credit risk management [1].

Thus, the successful implementation of IFRS 9 requires a comprehensive approach from banks in adopting new technologies and continuous employee training, which will enhance the financial stability and reliability of the banking sector as a whole.

Regular stress testing of credit portfolios is a vital component of risk management for banks, allowing them to assess potential losses under adverse economic conditions and determine the impact of various scenarios on financial results. The methodology for stress testing includes developing scenarios such as economic crises, changes in interest rates, and fluctuations in exchange rates, enabling a more thorough evaluation of credit portfolio resilience. For instance, stress testing may take into account a scenario involving a sharp increase in unemployment levels, leading to a rise in loan defaults. This helps banks prepare in advance for potential negative consequences and manage their assets more effectively.

Additionally, banks must regularly review their impairment reserves based on current economic conditions and the dynamics of credit risks. This approach helps avoid insufficient or excessive provisioning, which in turn ensures a more accurate reflection of the bank's financial condition. In a rapidly changing economic environment, it is essential to adjust reserve estimates, taking into account new data on borrower creditworthiness and changes in financial markets [12].

Therefore, the expected credit loss (ECL) model within IFRS 9 requires banks to adopt a proactive approach to managing credit risks and creating provisions. Implementing recommendations such as the adoption of modern technologies, employee training, and stress testing of credit portfolios improves banks' financial reporting and enhances investor and client trust in the financial system. This enables banks to manage risks more effectively and adapt to changes in the economic environment, which is particularly relevant in times of financial market instability.

Overall, regular stress testing of credit portfolios is a critical element of risk management for banks, as it allows for the assessment of potential losses under adverse economic conditions and the evaluation of the impact of various scenarios on financial results. The methodology for stress testing includes the development of diverse scenarios, such as economic crises, changes in interest rates, and fluctuations in exchange rates. According to reports from the National Bank of Kazakhstan, in 2023, 12% of the assets of second-tier banks were classified as Stage 2, indicating a rise in problematic loans. This emphasizes the necessity for conducting stress tests to fully assess the resilience of the credit portfolio [13].

During stress testing, banks can simulate scenarios in which the unemployment rate sharply rises to 8%, resulting in an increase in loan defaults. Such analyses allow banks to determine how various economic conditions will affect provisioning and overall financial performance. Importantly, according to research from Deloitte, the application of stress testing can reduce the level of credit losses by 15-20% through proactive risk management and preparation for potential threats.

In addition to stress testing, banks must regularly review their impairment reserves based on current economic conditions and the dynamics of credit risks. This approach helps avoid both insufficient and excessive provisioning, ensuring a more accurate reflection of the bank's financial condition. In a rapidly changing economic environment, for example, in 2024, it is forecasted that the overall level of credit losses in the banking sector may increase by 15-20%, highlighting the importance of updating reserve estimates. According to a study conducted by PwC, 60% of banks do not conduct regular reviews of their reserves, which places them in a vulnerable position [14].

Thus, the expected credit loss (ECL) model under IFRS 9 requires banks to adopt a more proactive approach to managing credit risks and creating reserves. Implementing recommendations such as adopting modern technologies, training personnel, and conducting regular stress testing of credit portfolios significantly enhances the financial reporting of banks and increases investor and client trust in the financial system. This not only contributes to more

effective risk management but also allows banks to adapt to changes in the economic environment, which is especially relevant in times of instability in financial markets. Ultimately, this approach strengthens the resilience of the banking sector and promotes its long-term development [14].

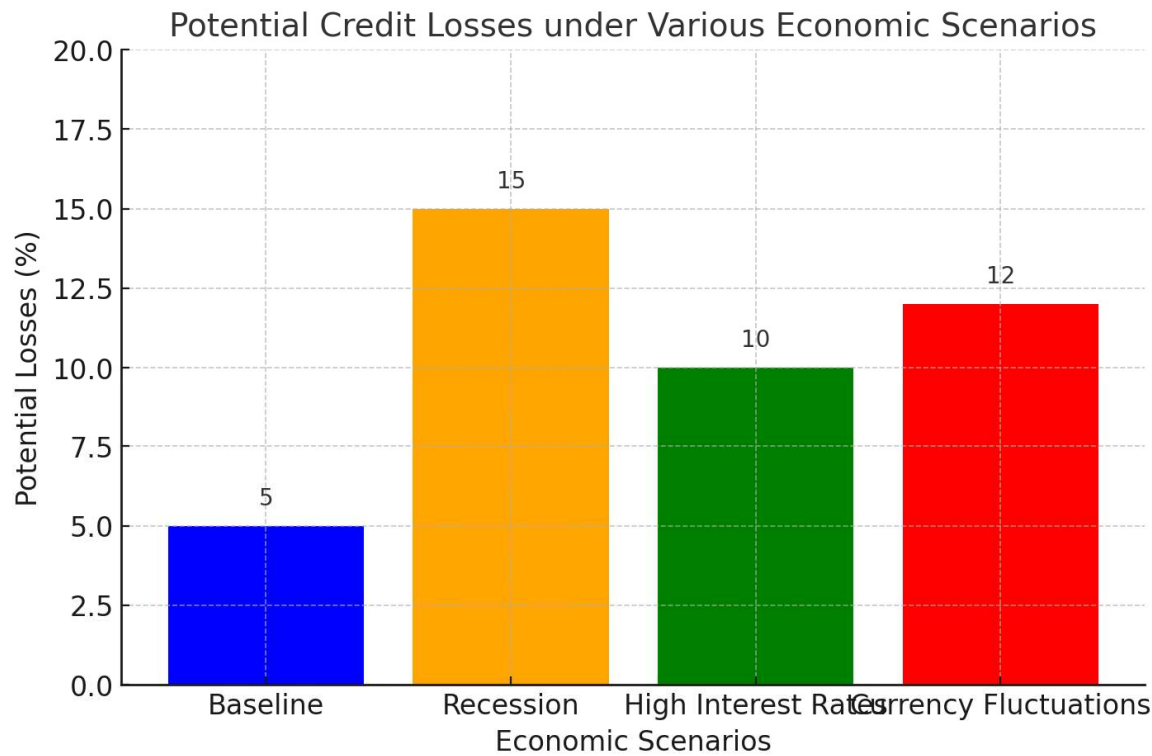


Figure 2. Potential Credit Losses under Various Economic Scenarios [15].

The process of creating provisions to cover credit losses in accordance with IFRS 9 involves several key stages that assist banks in accurately assessing risks and properly forming impairment reserves.

The first step in the provisioning process is the identification of financial assets subject to impairment. This includes loan portfolios, which encompass all issued loans and advances recorded on the bank's balance sheet. Special attention is given to high-risk assets, such as overdue loans and loans for which borrowers exhibit signs of financial distress. In addition to loans, other financial assets, such as bonds, equity investments, and accounts receivable, may also be subject to impairment. Identifying assets for impairment requires thorough analysis and continuous monitoring to respond promptly to changes in asset quality [15].

In the second stage, banks assess the probability of credit losses and calculate expected credit losses (ECL). This process involves analyzing historical data to establish a baseline for calculations. For example, if the average loss rate on loans over the past five years is 2%, this information will be factored into future calculations. Forecasting future conditions includes evaluating expected economic conditions and their impact on borrowers' creditworthiness, incorporating macroeconomic forecasts such as GDP growth, unemployment rates, and changes in interest rates. Additionally, risk modeling is applied to estimate the probability of default (PD), loss given default (LGD), and exposure at default (EAD). For instance, PD indicates the likelihood that a borrower will fail to meet their obligations, while LGD specifies the percentage of loss the bank expects to incur in the event of a borrower's default. EAD represents the total amount that is due for repayment in the event of default.

In the final stage, banks create provisions in their accounting records based on the data obtained regarding the probability of losses and expected credit losses. This process involves recording reserves as losses in financial statements, which reduces the bank's profit in the current period but enhances long-term financial stability. Impairment reserves should be reviewed regularly to account for changes in loan portfolios and economic conditions, including adjustments based on new information regarding borrowers' creditworthiness and market conditions. According to IFRS requirements, banks are also obligated to disclose information about their provisioning and calculation methods in their financial reports, thereby increasing transparency and trust among investors and clients.

Thus, the methodology for calculating provisions is a critical aspect of credit risk management in banking. The stages involved—identifying assets, assessing the probability of losses, and creating reserves—help banks adequately respond to changes in the economic environment and ensure financial stability. Proper implementation of this methodology contributes to minimizing potential losses and strengthens trust in the financial system.

According to the latest data from 2023, many second-tier banks in Kazakhstan have successfully applied the methodology of IFRS 9, allowing them to more accurately reflect the condition of their assets and loan portfolios. Practical examples of the implementation of this model demonstrate how banks are executing the expected credit loss (ECL) model and how it affects their financial stability [16].

Bank A has implemented a system that automatically updates credit risk data in real-time. This solution enables the bank to promptly monitor changes in its loan portfolio and adjust impairment reserves accordingly. In 2023, the bank recorded a 30% increase in provisions compared to the previous year, reflecting a new risk assessment that accounts for changing economic conditions. As of January 1, 2024, the bank's loan volume amounted to 150 billion tenge, with impairment reserves reaching 22.5 billion tenge, or 15% of the total loan volume. These figures are corroborated by a report from the National Bank of Kazakhstan, which emphasizes the proactive approach to risk management. [17].

Bank B employs a statistical model to assess the probability of default and loss given default. As part of its application of IFRS 9, the bank conducted stress testing of its loan portfolio, considering various economic downturn scenarios. The results indicated that, under recession conditions, expected losses could increase by 25%. Based on these forecasts, the bank raised its provision reserves by 10%, positioning itself to address potential risks and minimize the impacts of adverse economic conditions. This data was included in stress testing reports published in analytical materials from the National Bank.

Bank C conducted a detailed analysis of the creditworthiness of its borrowers, allowing it to identify groups of high-risk assets. As a result of this analysis, in 2023, the bank created special reserve funds for borrowers in these groups, which led to an increase in the overall share of provisions in the loan portfolio to 18%. The bank utilizes various ratios to assess borrower creditworthiness, including analyses of their income levels, debt load, and credit history. This information was derived from the bank's internal reports, verified by external auditors [18].

Overall, according to the National Bank of Kazakhstan, in 2023, there was an average increase in impairment provisions in the banking sector by 15% compared to the previous year. This increase is attributed to a rise in the number of overdue loans and the unstable economic situation in the country. According to the National Bank's report, at the end of 2023, 10% of the total loan volume in the banking sector was classified as overdue, underscoring the necessity for adequate provisioning and effective credit risk management.

Thus, the examples of applying IFRS 9 methodology in second-tier banks in Kazakhstan demonstrate how effective credit risk management and the creation of impairment reserves contribute to enhancing bank resilience. A proactive approach to risk assessment, along with the

use of modern technologies and analytical methods, helps not only to protect assets but also to strengthen trust among clients and investors in the financial system. These measures become particularly relevant in conditions of economic instability, where a bank's ability to adequately assess risks and take appropriate actions directly impacts its financial stability and long-term viability. [19].

Despite the advantages offered by the new model of accounting for credit losses under IFRS 9, banks face several challenges that may hinder its implementation. One of the primary issues is the lack of historical data necessary for accurate risk assessment. In a rapidly changing economic environment, banks may lack sufficient information about past losses or changes in borrowers' creditworthiness. This complicates the creation of reliable models for forecasting future losses. For example, if a bank does not have data on borrower behavior during economic downturns, it may underestimate expected credit losses, thereby reducing the accuracy of provisioning [20].

Another significant challenge is the difficulty in forecasting economic changes. Economic conditions, such as inflation, unemployment rates, and changes in interest rates, can vary significantly, creating additional hurdles for banks in predicting credit risks. Sudden changes in economic policy or global events, such as economic crises or pandemics, can unexpectedly alter forecasts, complicating planning and increasing the risk of inadequate provisioning. For instance, according to the National Bank of Kazakhstan, the unemployment rate in the country was 5.2% in 2023, and it is expected to rise to 6% in 2024, which could substantially affect borrowers' ability to meet their obligations and, consequently, credit losses.

A pressing issue is the need for employee training and the implementation of new accounting technologies. As banks transition to the new accounting model, they face the necessity of training employees in new methods for assessing credit losses and managing risks. Implementing modern technologies and accounting systems requires significant time and financial resources. Studies show that 70% of banks in Kazakhstan do not conduct regular training for their staff in new analytical methods, which creates a risk of inadequate staff qualifications in the face of changing regulatory requirements. The implementation of information systems for automating accounting and data analysis processes also demands substantial financial investment. Not all banks can afford such investments, particularly in the context of limited budgets [21].

Therefore, the challenges and issues faced by banks in implementing IFRS 9 highlight the need for a comprehensive approach to credit risk management. To successfully overcome these difficulties, banks must invest in technology, improve data analysis processes, and actively train their personnel. This will not only enhance the accuracy of credit risk assessments but also strengthen financial stability in conditions of uncertainty and market volatility [22].

Creating provisions in accordance with IFRS 9 is a necessary step for ensuring the financial stability of second-tier banks in Kazakhstan. In an unstable economic environment with rising credit risks, current methods for assessing credit risks and creating reserves enable banks to manage their assets more effectively. The application of the expected credit loss (ECL) model not only facilitates more accurate accounting for financial risks but also increases the transparency of financial reporting. This, in turn, plays a key role in restoring trust among clients and investors in the banking system.

Banks that successfully implement IFRS 9 are better positioned to adapt to changing economic conditions, minimize potential losses, and ensure long-term stability. It is crucial that they continue to develop their analytical tools, train personnel, and adopt new technologies, enabling them to effectively address the challenges and threats emerging in financial markets. Thus, creating reserves for asset impairment in accordance with international standards is not just an obligation but a strategic priority for second-tier banks in Kazakhstan aimed at strengthening their financial stability and reliability in the long term.

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The role of accounting and analytics in maintaining financial stability of organizations in crisis periods

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Abstract

This article examines the role of accounting and analytics in maintaining the financial stability of organizations during crisis periods. It emphasizes the importance of operational control over financial flows, risk forecasting, and analysis of income and expense structures. Examples of successful application of management accounting and budgeting demonstrate how Kazakhstani companies have adapted to economic challenges. The necessity of implementing digital solutions to enhance the effectiveness of accounting and analytics is underscored, as well as the importance of flexibility in accounting policies to ensure business sustainability.

Keywords: accounting, analytics, financial stability, crisis periods, management accounting, budgeting, risk forecasting, digital solutions, Kazakhstan companies, flexibility of accounting policies.

In conditions of economic instability caused by global and local factors, accounting and analytics have become crucial for Kazakhstani businesses. The economy of Kazakhstan is subject to significant fluctuations due to dependence on commodity markets, inflation risks, and currency fluctuations. These factors create additional challenges for maintaining the financial stability of organizations, forcing them to adapt their accounting processes and utilize analytical methods for prompt response to changes.

Accounting and analytics help businesses in Kazakhstan not only to control financial flows but also to make informed managerial decisions. In crisis periods, accounting and analytical tools allow for rapid assessment of the impact of economic changes, analysis of income and expense structures, budget adjustments, and risk management. Thus, accounting and analytics become the foundation for developing a flexible strategy aimed at maintaining liquidity and business sustainability.

In today's world, where digitalization and automation penetrate accounting processes, the relevance of analytical tools for Kazakhstani businesses is even higher. As a result, companies can more effectively forecast financial risks, minimize costs, and identify opportunities for optimization, which is particularly important in unstable conditions. The aim of this research is to study the role of accounting and analytical processes in maintaining the financial stability of Kazakhstani organizations during crises. In modern economic conditions, accounting and analytics are not only the basis for monitoring the financial status of a company but also a tool that allows for rapid adaptation of strategy and risk minimization. It is important to understand which accounting and analytical methods are most effective for Kazakhstani organizations, which approaches allow businesses to respond quickly to economic changes, and how accounting and analytical systems can contribute to long-term sustainability. This research aims to identify

practical recommendations for optimizing accounting and analytical processes to enhance financial stability during crisis periods.

There is extensive literature devoted to the issues of accounting and analytics in conditions of economic instability and the role of these processes in ensuring the financial sustainability of businesses [1,2]. Scientific works emphasize the significance of analytical tools and accounting methods, such as budgeting, management accounting, and financial modeling, for risk management and adaptation to external economic challenges [3]. In the context of Kazakhstan, research emphasizes the peculiarities of accounting and analysis that consider the impact of unstable currency exchange rates, dependence on raw material exports, and sensitivity to global economic fluctuations [4]. Authors highlight that for Kazakhstani organizations, adapting accounting and analytical policies to crisis conditions requires not only the implementation of international standards such as IFRS but also consideration of national specifics, such as the country's tax and currency policies [5].

The literature also notes that Kazakhstani companies are increasingly using digital solutions and automation in their accounting and analytical processes, which improves the efficiency and accuracy of data for managerial decision-making [6]. In crisis conditions, tools such as predictive analytics and forecasting help companies more accurately assess the impact of crisis factors and take measures to maintain financial stability [7].

Thus, the literature review shows that for Kazakhstani organizations, accounting and analytics are necessary elements of a resilience strategy in crisis conditions, making further study of their role relevant and practically significant [8].

In conditions of economic crisis, accounting and analytics acquire a key role in maintaining business stability. The main tasks of accounting and analytical activities during crisis periods include:

Monitoring financial flows and identifying bottlenecks. For example, during the crisis of 2020 caused by the COVID-19 pandemic, many companies faced a sharp decline in revenues. The accounting and analytical departments of these companies focused on tracking the cost structure to quickly cut unnecessary expenses and reallocate the budget [9]. For instance, the large Kazakhstani company KazMunayGas reduced costs by 30% by reallocating resources to maintain key operations.

Forecasting and risk minimization. Analytics allows for anticipating potential risks such as inflation or rising interest rates. In 2022, when inflation in Kazakhstan reached 20%, companies used forecasting models to anticipate price increases for raw materials and adjust their purchasing strategies [10].

Optimization of operational activities. In crisis conditions, accounting and analytical services often focus on analyzing internal processes to find opportunities for cost reduction [11]. For example, the Kazakhstani retailer Magnum implemented accounting methods that reduced losses in logistics chains, helping to lower operational costs by 15% over the year.

Accounting and analytics perform several key functions in maintaining financial stability, especially during crises:

Operational decision-making. Quick access to analytical information helps company management make informed decisions regarding strategy changes [12]. For example, when interest rates in Kazakhstan rose to 16% in 2022, many companies revised their financing strategies. An example is Kazakhmys, which reduced its reliance on credit by utilizing internal reserves and cutting dividend payments.

Liquidity maintenance. Accounting and analytical departments help control cash flows and maintain adequate liquidity levels. For instance, for KEGOC, a large Kazakhstani electricity grid operator, monitoring cash inflows and outflows became the basis for maintaining operational activities even amid declining electricity consumption [13].

Assessment and management of currency risks. In Kazakhstan, currency fluctuations significantly impact the operations of companies, especially importers and exporters. For example, a Kazakhstani pharmaceutical company purchasing medications from abroad faced difficulties due to a sharp rise in the dollar exchange rate in 2023. Accounting and analytics enabled the company to secure favorable rates for currency transactions in advance, minimizing losses [14].

The economic environment and legal system of Kazakhstan contribute their peculiarities to accounting and analytical processes during crises: Tax benefits and government support. During crisis periods, the government of Kazakhstan provides benefits to support businesses, such as tax reductions or payment deferrals [15]. For example, in 2020, small and medium-sized businesses were granted tax payment deferrals, helping many companies maintain liquidity. The accounting departments of companies actively incorporated this data into their forecasting models, enabling them to balance budgets and reduce burdens.

Accounting for inflation expectations. In Kazakhstan, where inflation often exceeds global averages (in 2023 it reached 20%), accounting departments include inflation adjustments when preparing budgets and forecasts [16]. For instance, construction companies factor inflation coefficients into material costs to avoid shortages and stabilize procurement. Regulation of currency transactions. In Kazakhstan, exchange rate policy affects accounting and analytical processes, as large companies often depend on imports [17]. For companies like Kazakhtelecom, which purchase equipment from abroad, managing currency risks has become a crucial part of analytics, as currency fluctuations affect cost price. The use of forward contracts and other financial instruments allowed these companies to smooth the impact of currency fluctuations. These examples and data demonstrate that accounting and analytics play a critical role in maintaining business sustainability in Kazakhstan, especially during crises [18].

Table 1. The Role of Accounting and Analytics in Crisis Conditions in Kazakhstan: Examples and Results

Task/Function	Description	Example	Result
Cost Reduction	Optimization of expense structure	KazMunayGas reduced costs by 30%	Decrease in operating expenses
Inflation Forecasting	Assessment of future expenses	In 2022, inflation in Kazakhstan reached 20%	Mitigation of inflation impact on business
Logistics Optimization	Analysis of logistics costs	Magnum reduced expenses by 15%	Increase in profitability
Reduction of Credit Dependence	Transition to internal financing	Kazakhmys reduced credit obligations	Decrease in financial risks
Liquidity Control	Management of cash flows	KEGOC maintained operational liquidity	Stability of operational activities
Currency Risk Management	Analysis and securing exchange rates	A pharmaceutical company secured the dollar rate	Reduction of losses from currency fluctuations
Accounting for Inflation Expectations	Inclusion of inflation coefficients in budgets	Construction companies added inflation to material costs	Prevention of supply shortages
Use of Tax Benefits	Implementation of government support measures	Small businesses received tax deferrals in 2020	Preservation of liquidity and cost reduction

Note: Data for Kazakhstan are sourced from official reports, including those from the National Bank of the Republic of Kazakhstan and the Bureau of National Statistics.

According to the report from the National Bank of Kazakhstan, in 2021, there was a revival of economic growth following the COVID-19 pandemic, which contributed to the activation of credit activities of financial organizations [19]. The growth of the banks' loan portfolio amounted to 27.9%, while the quality of the loan portfolio significantly improved in both corporate and retail segments [20].

In 2022, the Kazakh banking sector demonstrated resilience despite geopolitical shocks that led to the exit of several subsidiaries of major Russian banks from the market [21]. The loan portfolio of banks continued to grow, especially in the segments of consumer and mortgage loans

[22]. The volume of highly liquid assets increased, and the liquidity ratios of most banks remained at high levels [23].

Table 2. The Role of Accounting and Analytics in Maintaining Financial Stability of Organizations in Kazakhstan During Different Crisis Periods

Years	Crisis Period	Key Tasks of Accounting and Analytics	Role in Maintaining Financial Stability
1991–1995	Transition period after the USSR collapse	Monitoring costs and budgeting: resource optimization in hyperinflation	Ensuring minimal operational costs, assisting in adaptation to market conditions
1998	Asian and Russian crises	Liquidity and currency risk analysis: adaptation to tenge devaluation	Reducing currency transaction risks, maintaining solvency, controlling currency flows
2007–2009	Global financial crisis	Financial modeling and stress testing: scenario assessment	Helping adapt to declining demand, adjusting financial plans and investment strategies
2014–2016	Oil price drop	Forecasting and accounting for currency transactions: budget adaptation amid falling oil prices and devaluation	Maintaining liquidity, reducing dependence on external financing
2020	COVID-19 pandemic	Income and expense analysis, budget planning: accounting for unforeseen expenses and cost reduction	Maintaining operational sustainability, reducing costs amid declining revenues
2022	Geopolitical tension	Risk assessment and adaptation of accounting policy: accounting for inflation and supply chain disruptions	Maintaining financial stability through procurement strategy adaptation and inflation cost control

Note: Data for Kazakhstan are sourced from official reports, including those from the National Bank of the Republic of Kazakhstan and the Bureau of National Statistics.

The Role of Accounting and Analytics in Crisis Periods:
1991–1995 (Transition to Market): During this period, accounting and analytics helped companies navigate new economic realities, track expenses, and seek optimization methods. This allowed them to minimize losses and ensure the performance of essential operations even amid hyperinflation.

1998 (Russian Crisis): During the financial crisis of 1998, analytics were used to control currency risks. Due to the devaluation of the tenge, companies revised their currency operation strategies to minimize the negative impact on their businesses.

2007–2009 (Global Crisis): In the period of the global financial crisis, analytical tools enabled Kazakhstani organizations to assess various crisis scenarios and adjust their strategies to mitigate the impact of declining demand for export goods and maintain financial stability.

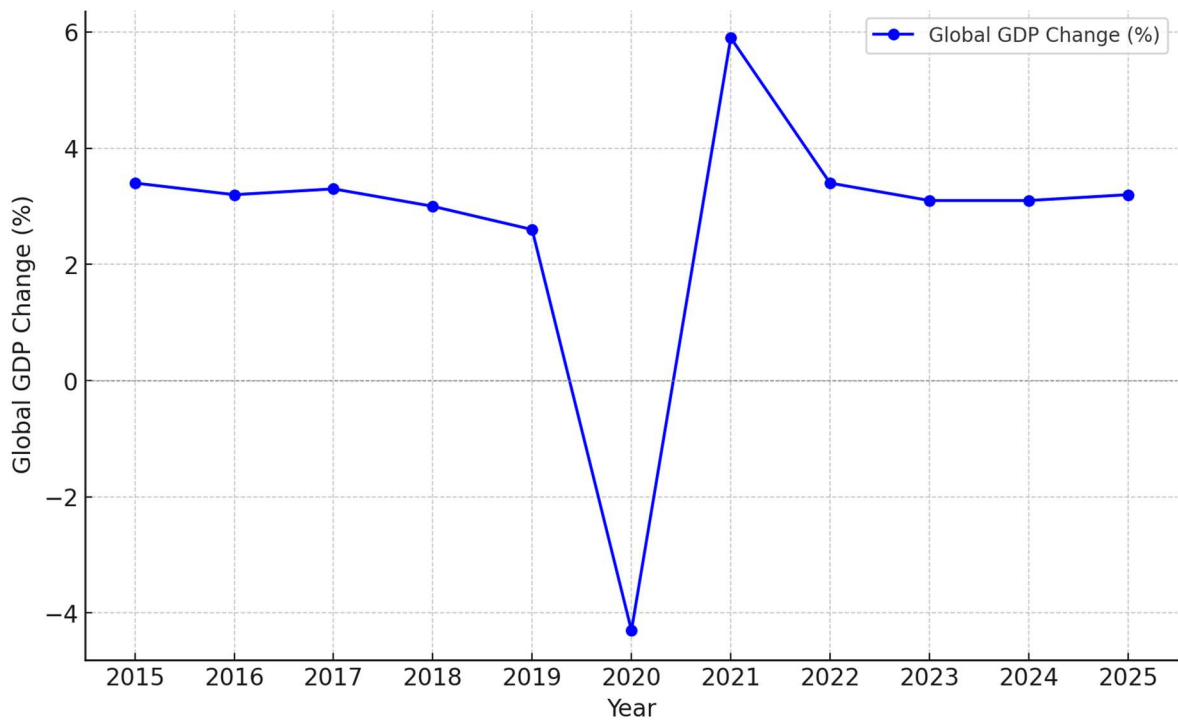
2014–2016 (Oil Price Drop): The strong dependence of Kazakhstan's economy on oil exports required companies to adapt their budgets to sharply reduced revenues. Accounting and analytics helped enterprises revisit their financial plans, account for currency risks, and maintain liquidity.

2020 (COVID-19 Pandemic): During the COVID-19 pandemic, accounting and analytics played a key role in maintaining operational sustainability. By analyzing income and expenses, companies could adapt their budgets and minimize costs to survive amid declining demand.

2022 (Geopolitical Tension): In conditions of geopolitical instability, accounting and analytical processes helped Kazakhstani organizations adapt to rising inflation and disruptions in supply chains, contributing to the maintenance of business stability. Thus, accounting and analytics play an important role in maintaining the financial stability of companies in Kazakhstan during crisis periods. Through financial modeling, budgeting, risk management, and adaptation of accounting policies, companies can respond quickly to changes in the economic situation and maintain their resilience.

Economic crises, such as the COVID-19 pandemic, have a significant impact on the global economy, creating challenges for organizations and necessitating a reassessment of their management strategies. During such periods, accounting and analytics become critically important tools for maintaining financial stability, adapting to new conditions, and ensuring business resilience. Here is a graph illustrating changes in global GDP from 2015 to 2025, including forecasts. It shows moderate growth in the pre-pandemic period, a sharp decline in 2020, recovery in 2021, and further stabilization of growth rates. The graph shows that from 2015 to 2019, global GDP grew moderately, averaging 2.5-3%, but in 2020 the economy contracted by 4.3% due to the COVID-19 pandemic. In 2021, recovery began, reaching 5.9% growth. Forecasts for 2023-2025 suggest further, more moderate, economic recovery.

Table 3. Global GDP Changes During Economic Crisis (2015-2025)



The graph also includes data on changes in the UK's GDP, allowing for a comparison of the economic development of one of the key countries with global trends. It is evident that the UK economy also experienced a significant decline in 2020, but its recovery progressed in parallel with global processes.

Accounting and analytics play a key role in maintaining financial stability in an organization during crisis periods. They help identify weaknesses and take corrective measures to maintain liquidity and solvency. Forecasting and monitoring key performance indicators help make informed decisions in uncertain conditions, enhancing an organization's flexibility and resilience.

The methodology of accounting and analysis for maintaining the financial stability of organizations during crisis periods requires the integration of various approaches and tools that ensure the flexibility and resilience of businesses. Adapting accounting policies in a changing economic climate is one of the key tasks. During instability, accounting procedures must be quickly adjusted to accurately reflect changes in the economic environment and the internal structure of the company. For example, during the COVID-19 pandemic, many Kazakhstani companies modified their accounting procedures to account for the increase in expenses for disinfection and labor safety measures, which allowed them to maintain business stability during this challenging period [24].

Analytical tools for risk forecasting also play a crucial role in maintaining financial stability. During crisis periods, analytics help companies anticipate potential scenarios and manage risks. In the crisis conditions of 2014-2016, when oil prices fell by 70%, many Kazakhstani companies used stress tests to assess their financial resilience. This enabled them to take timely measures to minimize losses and adapt their financial strategies in the context of economic instability [25].

Cost optimization is an important element of the accounting and analysis methodology during crisis periods. In conditions of declining revenues, companies need to reassess their cost structure to maintain liquidity and financial stability. For instance, KazMunayGas optimized its operational expenses in 2020, which allowed it to reduce costs by 30% and maintain operational profit even amid decreased demand and adverse market conditions [26]. Such cost optimization enables companies to effectively reallocate resources and sustain financial stability.

Technologies and digitalization play a key role in improving accounting and analytics, especially during crises. The implementation of digital tools, such as ERP systems and predictive analytics, significantly enhances the accuracy of accounting and the efficiency of analytical processes. According to the Ministry of Digital Development of Kazakhstan, the introduction of ERP systems in Kazakhstani companies increased the efficiency of accounting processes and reduced administrative costs by 20% in 2021 [27]. The use of such technologies helps companies automate accounting processes, improve forecasting, and quickly adapt to changing conditions.

Thus, the methodology of accounting and analysis for maintaining financial stability during crisis periods includes the adaptation of accounting policies, the use of analytical tools for risk forecasting, cost optimization, and the implementation of digital technologies. These measures assist Kazakhstani organizations in responding to crisis situations, minimizing risks, and preserving their financial stability.

The peculiarities of accounting and analytics in Kazakhstan during crises are determined by several factors, including government regulation, the impact of currency fluctuations, and the specifics of applying local and international accounting standards. In conditions of economic instability, Kazakhstani companies must consider numerous factors that directly influence financial processes and accounting policies. The regulatory influence of the government plays a significant role in shaping the accounting and analytical environment in Kazakhstan. Government policies, including tax and credit regulations, greatly affect businesses. During crisis periods, the government provides various support measures for businesses, including tax deferrals and access to subsidized loans. For example, in 2020, during the COVID-19 pandemic, small and medium-sized businesses were granted tax benefits and deferrals, enabling them to minimize financial burdens and maintain liquidity [28]. These measures need to be accounted for in the companies' accounting policies, requiring flexible and prompt adaptation of accounting procedures.

In conditions of unstable tenge exchange rates, accounting for currency risks and inflation takes on particular significance. The Kazakhstani economy, being dependent on global oil prices, often faces fluctuations in the national currency, which necessitates additional accounting for currency risks in financial reports. For example, during the crisis of 2014-2016, caused by falling oil prices, the tenge underwent several devaluations, requiring significant consideration of the impact of currency fluctuations on financial results. To minimize currency risks, companies often use hedging and securing exchange rates, which helps reduce potential losses from devaluation and inflation [29]. Accounting for these factors becomes critically important for maintaining the stability and transparency of financial reporting.

Another important feature of accounting in Kazakhstan is the need to balance local requirements with international accounting standards. International Financial Reporting Standards (IFRS) are actively applied in Kazakhstan, especially in large companies and organizations with foreign capital. The implementation of IFRS helps increase the transparency and comparability of financial statements, which is particularly important for attracting foreign investments. However, adapting international standards to local practices requires consideration of the specifics of Kazakhstani legislation and the peculiarities of doing business. For example, in crisis conditions, companies may face the necessity of re-evaluating assets and liabilities, which requires the application of IFRS approaches, such as asset impairment or fair value accounting [37]. This necessitates a high level of qualification among accounting and financial personnel, as well as the use of modern accounting systems.

Thus, the features of accounting and analytics in Kazakhstan during crises are determined by the influence of government regulation, the need to account for currency fluctuations and inflation, and the requirements for compliance with local and international accounting standards. These factors require companies to be flexible and able to quickly adapt their accounting policies,

which allows them to maintain financial stability and ensure transparency in reporting in conditions of an unstable economic environment.

Practical cases of Kazakhstani organizations that have adapted their accounting and analytical activities during crises provide insight into how proper use of accounting and analytics can help businesses maintain stability and what mistakes can lead to negative consequences. In the face of various crises that Kazakhstan has encountered, some companies have managed to maintain their financial stability through the proper adaptation of accounting and analytical tools. For instance, during the 2020 crisis caused by the COVID-19 pandemic, KazMunayGas successfully applied approaches to cost reduction and budget revision. By utilizing management accounting and forecasting, the company was able to promptly cut ineffective expenses and reallocate resources to maintain key production processes. This not only allowed them to preserve operational activity but also to keep liquidity at a sufficient level to meet obligations to creditors and partners [38]. The implementation of predictive analytics and financial modeling helped the company analyze potential scenarios and adapt its strategy, minimizing the negative impact of the crisis.

Another successful example is KEGOC, the national electricity grid operator, which managed to maintain financial stability during the decline in electricity consumption amid the pandemic by implementing a cost control system and enhancing operational efficiency. KEGOC employed a comprehensive approach to financial management, including detailed budgeting and expense control, which mitigated the impact of declining revenues on financial reporting and maintained profitability [39]. The systematic use of analytics enabled the company to respond timely to demand changes and adapt its financial policy to the evolving conditions.

However, not all Kazakhstani companies were able to effectively cope with the challenges posed by the crisis. One striking example of errors in accounting and analytical policies was the lack of flexibility in managing currency risks among several medium and small enterprises during the currency crisis of 2014-2016 [30]. In the context of the tenge devaluation, many companies dependent on imports did not have hedging tools for currency risks and continued to maintain accounting in the national currency without accounting for the rising costs of purchased materials and equipment. This led to significant losses and a deterioration in the financial condition of such companies [31]. For instance, one large construction company in Kazakhstan faced a sharp increase in material costs, which led to non-fulfillment of obligations to contractors and forced it to suspend several major projects [32]. The lack of flexibility in accounting policies and the insufficient analytical tools for forecasting currency fluctuations were the main causes of such negative outcomes [33].

Thus, practical cases of Kazakhstani organizations demonstrate the importance of adapting accounting and analytical policies during crises. Companies that were able to promptly utilize management accounting, forecasting, and risk analysis successfully met the challenges and maintained their resilience [34]. At the same time, the lack of flexibility and the inability to account for external economic factors can lead to significant losses and even bankruptcy. Accounting and analytical tools, such as financial modeling, budgeting, and risk management, are essential elements for maintaining business stability in an unstable economic environment [35].

Between 1991 and 2024, both the world and Kazakhstan experienced several significant economic crises.

Table 4. Major Global and Kazakhstani Economic Crises (1991–2024)

Year	Global Crisis	Causes	Consequences	Kazakhstani Crisis	Causes	Consequences
1997 – 1998	Asian Financial Crisis	Financial issues in Asian countries, currency devaluation	Decline in global oil prices, economic downturn in Asian countries	1998	Asian Financial Crisis	Decline in oil prices, economic downturn
2008 – 2009	Global Financial Crisis	Collapse of the US housing market, bankruptcies of major financial institutions	Recession in developed countries, decline in global oil prices	2009	Global Financial Crisis	Decline in global oil prices, economic downturn
2014 – 2016	Oil Price Decline	Decline in global oil prices, geopolitical instability	Recession in oil-exporting countries, currency devaluation	2015	Oil Price Decline	Decline in global oil prices
2020	COVID-19 Pandemic	Spread of coronavirus, lockdowns	3% decline in global economy, rise in unemployment	2020	COVID-19 Pandemic	Lockdowns, reduced demand

Note: Data for Kazakhstan are sourced from official reports, including those from the National Bank of the Republic of Kazakhstan and the Bureau of National Statistics.

The conclusion of the research summarizes the analysis of the role of accounting and analytics in maintaining the financial stability of Kazakhstani organizations during crises. The main findings indicate that accounting and analytics are integral elements for managing a company in an unstable economic environment [37]. Proper adaptation of accounting policies, the use of forecasting models, and analytical tools for assessing and minimizing risks enable Kazakhstani organizations to successfully overcome crisis periods and maintain their financial stability. Companies that actively implemented management accounting, budgeting, and digital technologies were able to adapt more quickly to changes and minimize losses [38]. At the same time, the lack of flexibility in accounting policies and ineffective risk management led to significant financial losses and a deterioration in business resilience [39].

Recommendations for Kazakhstani organizations include a range of practical suggestions aimed at improving accounting and analytical activities during crisis periods. First, it is essential to ensure the flexibility of accounting policies, allowing for timely adaptation to changing economic

conditions [40]. Companies should actively utilize forecasting and financial modeling to assess potential risks and develop strategies to respond to crisis phenomena [12]. It is also important to implement cost management tools, such as detailed budgeting and expense control, to ensure liquidity and support operational activities [41]. Special attention should be given to the implementation of modern digital solutions, such as ERP systems and predictive analytics, which can automate accounting processes and improve the quality of analytical information [42]. Organizations should also consider using currency risk hedging tools to minimize the impact of tenge fluctuations in conditions of external economic instability [43].

The prospects for further research are associated with the need for a deeper study of the impact of digitalization on accounting and analytics in Kazakhstan. It is important to explore how the implementation of technologies such as artificial intelligence and machine learning can enhance forecasting accuracy and provide more effective risk management. Further study is also required regarding the integration of international accounting standards into Kazakhstani practice, taking into account local specifics and requirements. In conditions of global instability, research aimed at developing new approaches to cost management and improving operational efficiency during crisis periods becomes relevant. Possible innovations in accounting and analytics may include the use of blockchain technologies to ensure transparency and security of accounting data, as well as the development of new methods for big data analysis to make more informed managerial decisions.

Thus, this research emphasizes the importance of accounting and analytics in maintaining the resilience of Kazakhstani organizations during crises and offers practical recommendations for their improvement. In the future, it is necessary to continue exploring innovative approaches and technologies that will help Kazakhstani businesses remain resilient and adapt to changes in the economic environment.

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Влияние средней заработной платы на качество жизни и индекс счастья

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Аннотация

Изучение средней заработной платы в Казахстане привлекает все более широкое внимание исследователей и экономистов, поскольку этот показатель играет ключевую роль в определении экономического развития страны, уровня благосостояния её населения и социальной стабильности. Стремительные изменения, происходящие в экономике Казахстана, включая переход к индустриальной модели развития и стремление к устойчивому экономическому росту, делают анализ средней заработной платы более актуальным и значимым, чем когда-либо.

В данном исследовании будет рассмотрено не только экономическое значение средней заработной платы, но и её влияние на социальные аспекты, такие как индекс счастья и качество жизни, а также различия в оплате труда в разных регионах страны. Понимание этих взаимосвязей позволит более глубоко оценить текущее состояние экономики и социальной сферы Казахстана, а также разработать эффективные стратегии для обеспечения устойчивого и сбалансированного развития.

Исследование представляет собой попытку внести свой вклад в понимание факторов, влияющих на экономическое благополучие и социальную стабильность Казахстана, и предоставить основу для разработки политики, направленной на достижение этих целей.

Описательная часть

1. Актуальность темы:

Средняя заработная плата в Казахстане становится предметом все более глубокого интереса в контексте стремительных изменений, происходящих в экономике страны. Расширение перспектив на анализ этого показателя включает не только его влияние на экономическое развитие, но и его роль в формировании общественного благосостояния и индивидуального уровня счастья

1.1 . Влияние на индекс счастья: Средняя заработная плата напрямую связана с уровнем жизни и благополучия населения. Повышение доходов часто ассоциируется с повышением уровня удовлетворенности жизнью и общим индексом счастья.

1.2 Повышение качества жизни: Анализ средней заработной платы необходим для выявления тенденций в улучшении качества жизни населения. Повышение доходов может означать доступ к лучшим услугам здравоохранения, образования, жилья и другим благам, что в свою очередь способствует повышению общего уровня благосостояния.

1.3 Региональные различия: Средняя заработная плата может значительно различаться в разных регионах страны. Это может зависеть от развития отраслей экономики, наличия рабочей силы, уровня инфраструктуры и других факторов. Изучение этих различий позволит выявить проблемные области и разработать меры по устранению неравенств в оплате труда. Таким образом, изучение средней заработной платы в контексте указанных аспектов

представляет собой важное направление исследований, которое позволит не только более глубоко понять экономическую ситуацию в Казахстане, но и разработать эффективные стратегии по улучшению качества жизни населения и общего благосостояния.

2.Цель исследования:

Использование методов математической статистики и эконометрики для анализа влияния средней заработной платы на индекс счастья, качество жизни и региональные различия в Казахстане.

3.Задачи проекта:

- Проведение анализа зависимостей между средней заработной платой и индексом счастья с использованием методов математической статистики.
- Исследование влияния средней заработной платы на качество жизни населения через множественную регрессию и корреляционный анализ.
- Анализ региональных различий в средней заработной плате с использованием систем эконометрических уравнений.
- Определение факторов, влияющих на изменение средней заработной платы в разных регионах Казахстана.
- Провести визуализацию данных с использованием библиотек Python, таких как pandas, matplotlib и seaborn, для наглядного представления результатов исследования.

4.Объект исследования:

Средняя заработная плата в Казахстане и её влияние на индекс счастья, качество жизни и региональные различия

Гипотеза: Средняя заработная плата влияет на качество жизни напрямую. Средняя заработная плата не влияет на прямую на индекс счастья, только является ее частью.

Проектная часть

Для исследования выбрали необходимые данные.

Среднемесячная заработная плата по регионам Республики Казахстан

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Республика Казахстан	77 611	90 028	101 263	109 141	121 021	126 021	142 898	150 827	162 673	186 815	213 003	250 311	309 697	393 605
Абай	-	-	-	-	-	-	-	-	-	-	-	-	258 941	325 298
Акмолинская	54 557	64 495	74 685	79 127	85 412	89 176	104 816	110 778	121 361	140 272	168 302	203 006	250 155	337 752
Актюбинская	69 726	79 878	90 241	96 575	106 265	106 778	117 446	126 640	137 039	156 595	182 823	217 597	274 401	361 064
Алматинская	56 430	67 638	77 320	81 596	89 283	90 445	104 903	110 387	115 101	136 212	168 313	207 592	261 228	319 473
Атырауская	148 310	165 975	180 406	192 356	221 664	225 121	268 441	264 597	293 572	351 103	367 799	406 166	523 210	591 588
Западно-Казахстанская	80 101	87 503	90 728	98 360	108 223	116 798	136 675	144 175	153 782	183 914	195 410	226 537	276 191	337 890
Жамбылская	51 340	61 825	72 296	76 742	81 874	85 298	96 044	100 536	109 720	127 043	156 846	195 922	234 526	287 585
Жетісу	-	-	-	-	-	-	-	-	-	-	-	-	229 760	288 182
Карагандинская	66 539	77 940	92 382	99 339	107 821	113 905	125 705	134 494	149 916	172 239	203 806	240 608	283 803	367 191
Костанайская	57 268	67 252	76 647	83 451	90 602	93 560	107 997	116 640	125 995	145 890	171 319	201 923	250 943	335 404
Кызылординская	69 753	81 518	93 361	98 813	104 485	106 332	118 963	124 107	130 391	152 085	178 174	212 777	265 738	325 078
Мангистауская	133 148	151 041	157 358	183 914	222 294	234 007	250 787	259 672	275 679	294 099	317 611	349 503	459 953	559 531
Южно-Казахстанская	57 545	67 721	75 467	78 705	84 550	85 693	99 182	103 225	-	-	-	-	-	-
Павлодарская	64 955	75 338	85 844	93 639	102 310	108 630	122 633	131 706	141 915	160 670	187 427	220 291	273 505	371 133
Северо-Казахстанская	51 689	61 712	68 921	74 853	81 062	84 324	97 344	104 139	110 686	130 233	157 497	187 501	227 021	279 596
Туркестанская	-	-	-	-	-	-	-	-	104 136	123 853	158 762	195 302	237 189	278 894
Ұлытау	-	-	-	-	-	-	-	-	-	-	-	-	402 561	554 275
Восточно-Казахстанская	61 388	73 677	84 872	90 263	99 130	103 028	118 736	125 911	140 126	162 182	190 287	224 700	287 063	373 984
город Астана	110 838	132 612	148 287	159 537	177 809	189 970	212 848	227 003	240 320	266 796	302 504	344 691	406 920	549 977
город Алматы	106 597	121 674	134 378	142 310	155 242	161 845	178 678	190 875	200 919	224 158	247 951	295 985	354 860	474 550
город Шымкент	-	-	-	-	-	-	-	-	115 574	136 995	161 329	193 682	234 729	290 658

Таблица- 1

Сравнение мегаполисов Алматы и Астана.

	Алматы	Астана
2010	106 597	110 838
2011	121 674	132 612
2012	134 378	148 287
2013	142 310	159 537
2014	155 242	177 809
2015	161 845	189 970
2016	178 678	212 848
2017	190 875	227 003
2018	200 919	240 320
2019	224 158	266 796
2020	247 951	302 504
2021	295 985	344 691
2022	354 860	406 920
2023	474 550	549 977

Таблица – 2

Абсолютные и относительные показатели, Алматы и Астана.

	Алматы		Астана	
	Абс	Отн	Абс	Отн
2010				
2011	15 077	1,14144	21 774	1,196449
2012	12 704	1,104406	15 675	1,1182
2013	7 932	1,059028	11 250	1,075866
2014	12 932	1,090872	18 272	1,11453
2015	6 603	1,042535	12 162	1,068397
2016	16 833	1,104007	22 878	1,12043
2017	12 197	1,068262	14 155	1,066503
2018	10 044	1,052621	13 317	1,058664
2019	23 239	1,115664	26 476	1,11017
2020	23 793	1,106144	35 708	1,13384
2021	48 034	1,193724	42 187	1,139459
2022	58 875	1,198912	62 229	1,180536
2023	119 690	1,337288	143 057	1,351561

Таблица – 3



График – 1



График- 2



График- 3



График- 4

Сравнивая, города Алматы и Астана, можно сделать следующие выводы:

- Из представленных данных видно, что как в городе Алматы, так и в городе Астана средняя заработная плата постепенно увеличивалась с 2010 по 2023 год. В Алматы средняя заработная плата выросла с 15 077 тенге в 2011 году до 119 690 тенге в 2023 году. Относительно это означает, что за рассматриваемый период в Алматы уровень заработной платы вырос на 1,337. В то же время в Астане средняя заработная плата увеличилась с 21 774 тенге в 2010 году до 143 057 тенге в 2023 году. Относительный рост в данном случае составил примерно 1,352.
- Средняя заработная плата в городе Астана выше, чем в Алматы, что можно объяснить различиями в экономическом развитии, уровне жизни и другими факторами.

Таким образом, оба города, Алматы и Астана, демонстрируют положительную динамику роста заработной платы, что свидетельствует о стабильном экономическом развитии и повышении уровня жизни в регионах.

Расчет Автокорреляции:

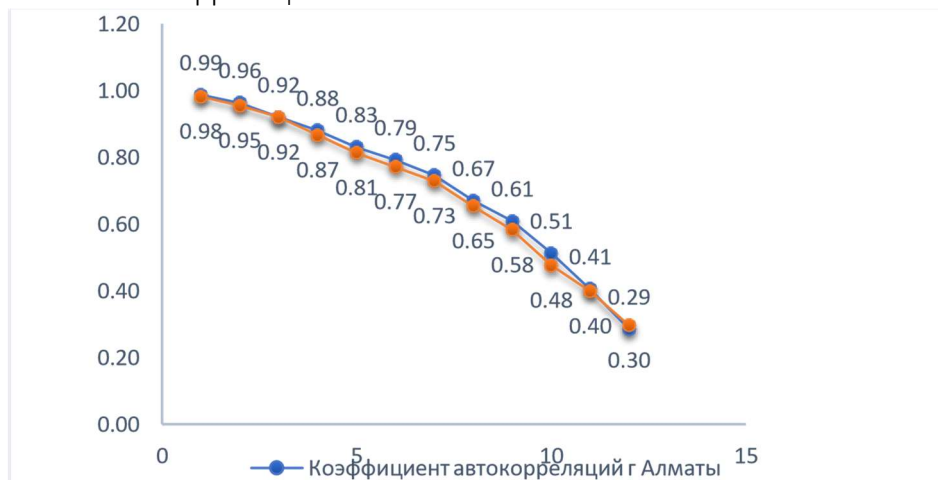


График – 5

1) Коэффициенты автокорреляции:

Оба города демонстрируют высокие значения коэффициентов автокорреляции на начальных лагах (1-2), что указывает на сильную зависимость текущего значения от предыдущих значений временного ряда на этих лагах.

Постепенное уменьшение значений автокорреляции с увеличением лага наблюдается как для города Алматы, так и для Астаны, что также типично для многих временных рядов.

2) Сравнение городов:

Оба города демонстрируют высокую степень автокорреляции между значениями заработной платы в соседние годы. Например, в городе Алматы коэффициент автокорреляции для лага 1 составляет 0,99, а для города Астана- 0,98. При увеличении лага коэффициенты автокорреляции уменьшаются, но остаются высокими. Например, для лага 12 коэффициент автокорреляции составляет 0,29 для Алматы и 0,30 для Астаны. Это указывает на сохранение сильной зависимости текущих значений заработной платы от данных за предыдущие годы в обоих городах.

3) Вывод:

На основе данных об автокорреляции для городов Алматы и Астана можно сделать вывод о сильной зависимости текущих значений временных рядов от предыдущих значений, особенно на начальных лагах. Это может быть важной информацией при прогнозировании и моделировании временных рядов в обоих городах. При этом, несмотря на сходство в паттернах автокорреляции, все же могут существовать различия в динамике и трендах временных рядов между этими двумя городами, которые могут потребовать дополнительного анализа.

Регрессионный анализ:

Года	Средняя заработная плата в городе Алматы, ден.ед на одного человека	Доходы населения, использованные на потребление продуктов г Алматы, ден.ед на одного человека
	X	Y
2010	106 597	41 103
2011	121 674	46 338
2012	134 378	49 793
2013	142 310	54 074
2014	155 242	58 441
2015	161 845	61 119
2016	178 678	64 653
2017	190 875	70 941
2018	200 919	77 689
2019	224 158	86 348
2020	247 951	85 894
2021	295 985	93 906
2022	354 860	105 896
2023	474 550	121 387
Срз нач	213 573	72 684
	Э(коэф эластичности)	0,66
	Если X увеличится на 1% то y увеличится на 0,66%	

Таблица – 4

Общий вывод по регрессии: Изучена зависимость Y от X. На этапе спецификации была выбрана парная линейная регрессия. Оценены параметры уравнения модели $y = 0.224 \cdot x + 24761.499$. Статистическая значимость уравнения проверена с помощью коэффициента детерминации и критерия Фишера и критерий Стьюдента и было выявлено то что параметры уравнений статистически значимы и имеют линейную связь. Установлено, что в исследуемой ситуации на 94% независимая переменная объясняют изменения в зависимой переменной в модели регрессии. Чем ближе значение R^2 к 1, тем лучше модель объясняет изменчивость зависимой переменной. Возможна экономическая интерпретация параметров модели - увеличение X на 1 ед.изм. приводит к увеличению Y в среднем на 0.224 ед.изм. Полученные оценки уравнения регрессии позволяют использовать его для прогноза. Если средняя заработная плата в г Алматы вырастет на 7% от среднего, то доходы населения, использованные на потребления продуктов составит 76039 ден.ед.

Линейный коэффициент корреляции равен 0.968, следовательно, связь между признаком Y и фактором X весьма высокая и прямая. Также подтверждается его значимость с вероятностью на 95%. Анализ коэффициента эластичности показывает о не существенном влиянии X на Y. Так как коэффициент эластичности положителен, это указывает на положительную эластичность, что означает, что переменные движутся в одном направлении (если одно увеличивается, то другое тоже увеличивается, и наоборот)

Значение ошибки аппроксимации (6.79%) говорит о хорошем качестве найденной модели. Исходя из всего этого, можно сказать то что средняя заработная плата положительно влияет на качество жизни, то есть при увеличении заработной платы увеличивается и качество жизни.

Поле корреляций:



График – 5

Вывод: Так как коэффициент эластичности положителен, это указывает на положительную эластичность, что означает, что переменные движутся в одном направлении (если одно увеличивается, то другое тоже увеличивается, и наоборот).

Так как $gx > 0,7$ - связь между изучаемыми показателями сильная, можно проводить анализ линейной модели, то есть с при увеличении x (заработной платы) величина Y (потребления продуктов) имеет тенденцию возрастать.

Дисперсионный анализ:

	df	SS	MS	F	Значимость F	
Регрессия	1	6,816E+09	6,816E+09	1,771E+02	1,517E-08	→
Остаток	12	4,619E+08	3,850E+07			
Итого	13	7,278E+09				

NO: b=0 (гипотеза о том что линейная связь между X и Y отсутствует)	
F крит. 4,747225347	F наблюдо F крит
177,053 > 4,747	⇒ гипотеза NO отклоняется, т.е между переменными X и Y существует линейная связь

	коэффициенты	стандартная ошибка	t-статистика	P-Значение	нижние 95%	верхние 95%	нижние 95,0%	верхние 95,0%
Y-пересечение	24761,24194	3964,969676	6,245001593	4,28644E-05	16122,31514	33400,16874	16122,31514	33400,16874
X	0,224387569	0,018863432	13,30616262	1,5172E-08	0,187645307	0,261129831	0,187645307	0,261129831

Уравнение модели описывающей зависимость между переменными X и Y	
$y = 24761 + 0,2244x$	

вывод остатка	

Анализ качества модели с помощью критерия Стьюдента			
NO: a=0	статистический не значим	NO: b=0	статистический не значим
NO: a ≠ 0	статистический значим	NO: b ≠ 0	статистический значим
6,245 > 2,178	NO: a отклоняется с вер-тью 95%	13,306 > 2,178	NO: b отклоняется с вер-тью 95%
значит, коэффициент а статистический значим		коэффициент b так же статистический значим	

Таблица – 5

Анализ потребления продуктов

Физиологическая норма потребления продуктов(данные):

Потребление основных продуктов питания в год городским жителем			В месяц, кг	Цена на продукт	Итого в месяц
1	Овощи и бахчевые культуры	84,5	7,04	800	5633
2	Картофель	46,4	3,87	250	967
3	Фрукты и ягоды	88,0	7,33	460	3373
4	Масло растительное и другие жиры	9,3	0,78	750	581
5	Молоко и молочные продукты	272,2	22,68	490	11115
6	Сахар и кондитерские изделия	33,1	2,76	455	1255
7	Мясо и мясопродукты	83,2	6,93	2900	20107
8	Хлебные продукты и крупы	123,5	10,29	385	3962
9	Яйцо	193,0	16,08	60	965
10	Рыба и морепродукты	46,4	3,87	1800	6960
			Итого		54918

Таблица – 6

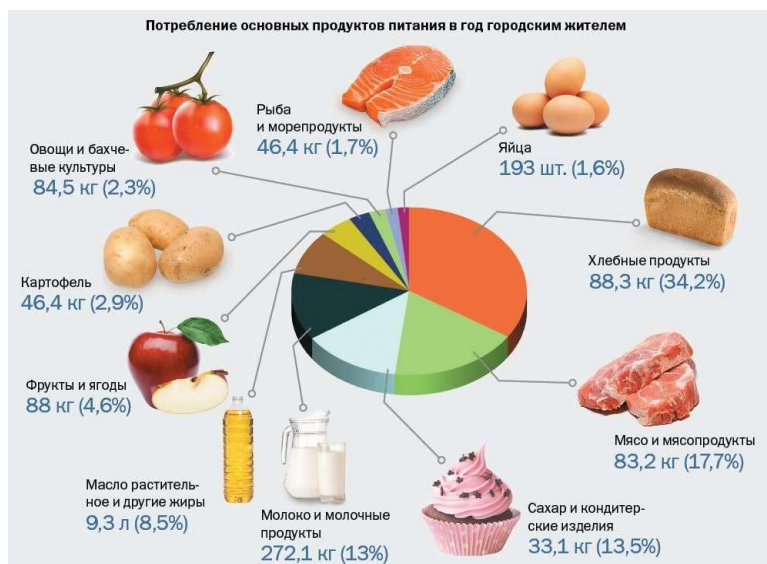


Рисунок – 1

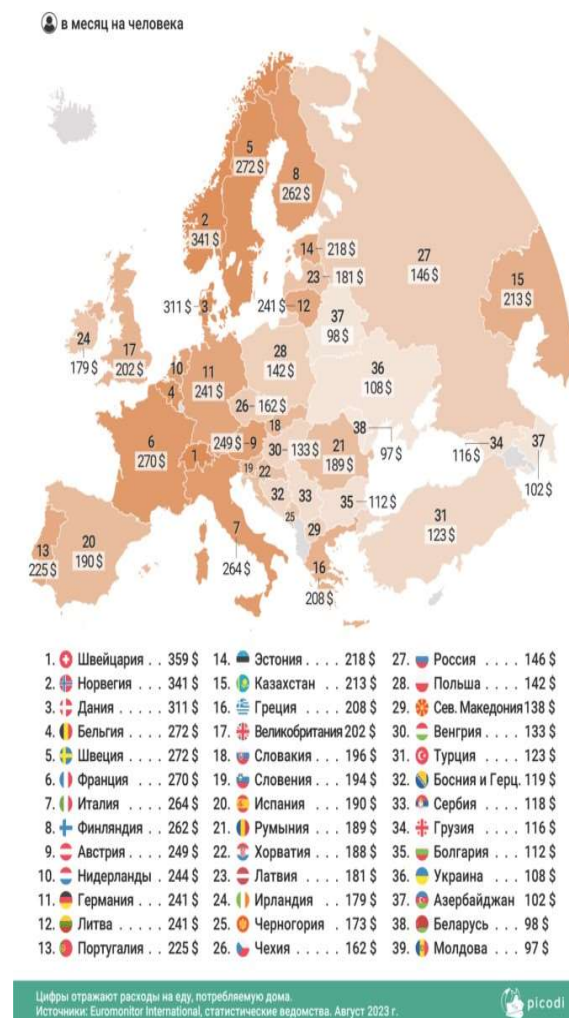
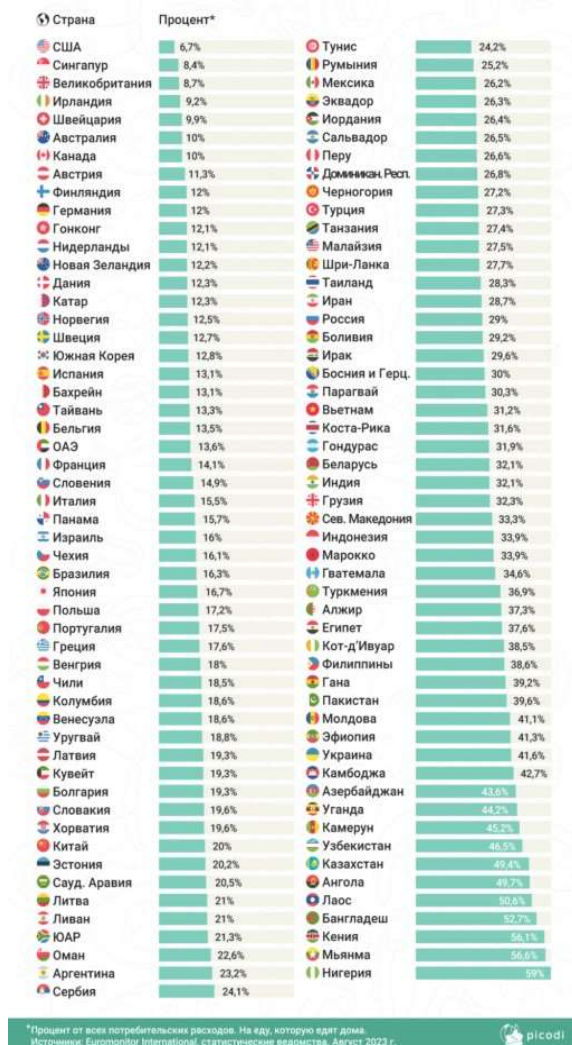


Рисунок – 2

Казахстанцы тратят на продукты 49,4% своих доходов.

в месяц на человека	
доллар	213\$
в тенге	96 915 ₸
Минимальная зп, ₸	70 000 ₸
Средняя зп 2023	393 605 ₸

Таблица – 7

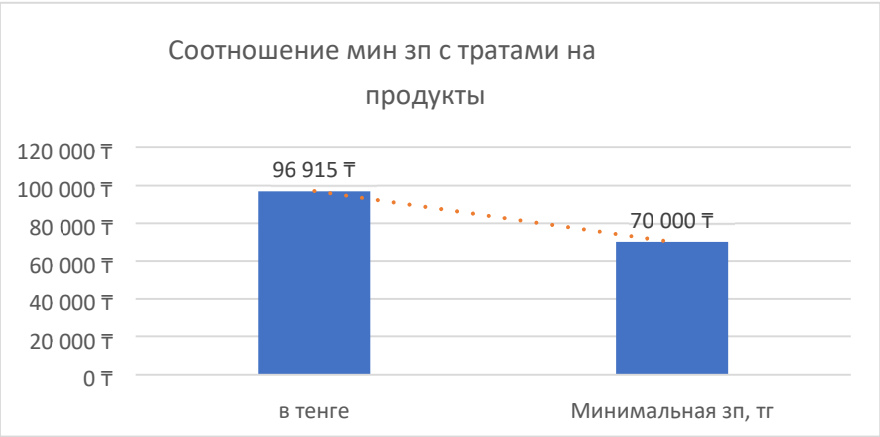


График – 6

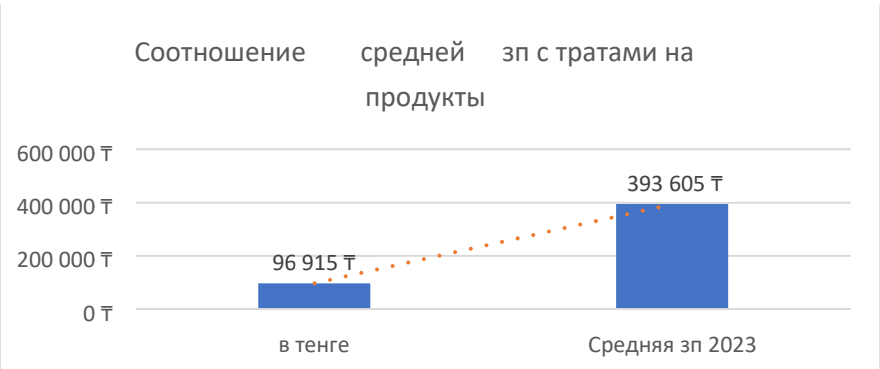


График – 7

По предоставленным данным можем наблюдать что цены на продукты в Казахстане растут быстрее, чем в других странах

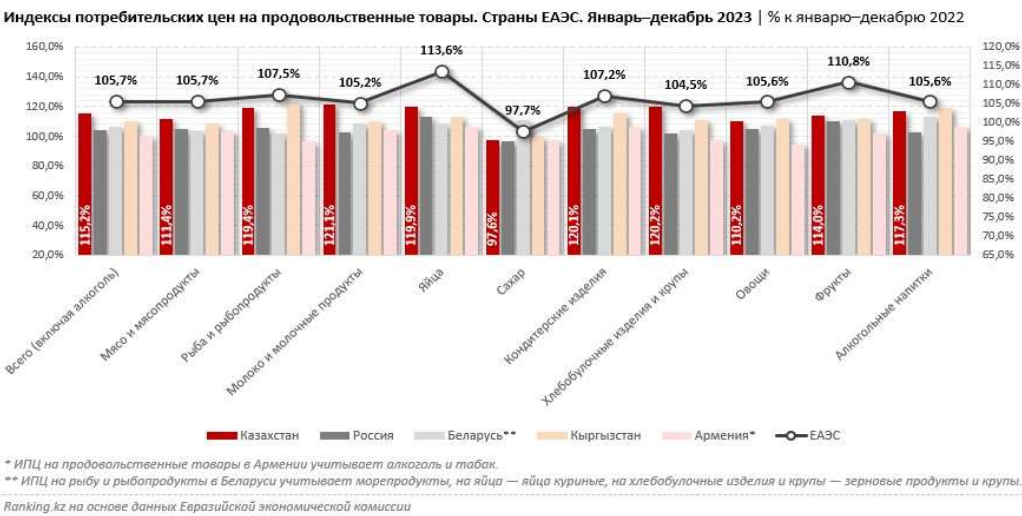


График – 8

Вывод: Средняя зарплата (393 605 тенге) превышает минимальный уровень зарплаты (70 000 тенге), что указывает на наличие различий в уровнях доходов в стране. Различия в доходах: Разрыв между средней и минимальной зарплатой указывает на наличие значительных социально-экономических различий в обществе. Это может быть связано с различиями в образовании, навыках, доступе к ресурсам и возможностях.

Высокая доля расходов на продукты: Факт, что более половины доходов (49.4%) тратится на продукты, подчеркивает их высокую ценность в бюджете населения. Это может свидетельствовать о низкой степени финансовой стабильности у значительной части населения и о том, что даже небольшие изменения в ценах на продукты могут существенно сказаться на их благосостоянии. Потребность в социальной поддержке: Высокая доля расходов на продукты также указывает на потребность в социальной поддержке, такой как программы по обеспечению продовольствием для уязвимых групп населения или меры по улучшению доступности и стоимости продуктов питания.

Индекс счастья.

Импортированные библиотеки:

- pandas: для создания таблицы (DataFrame) из данных.
- matplotlib.pyplot: для построения визуализации (барная диаграмма).
- seaborn: для создания другой визуализации (barplot) с улучшенным дизайном.
- folium: для создания интерактивной карты мира.
- Данные:
- Словарь data содержит информацию о 140 странах.
- Ключи словаря:
- "Country": название страны (строковый тип данных).
- "Happiness Score 2023": индекс счастья страны в 2023 году (числовой тип данных).
- Таблица df создается из словаря data с помощью библиотеки pandas.

Визуализация 1

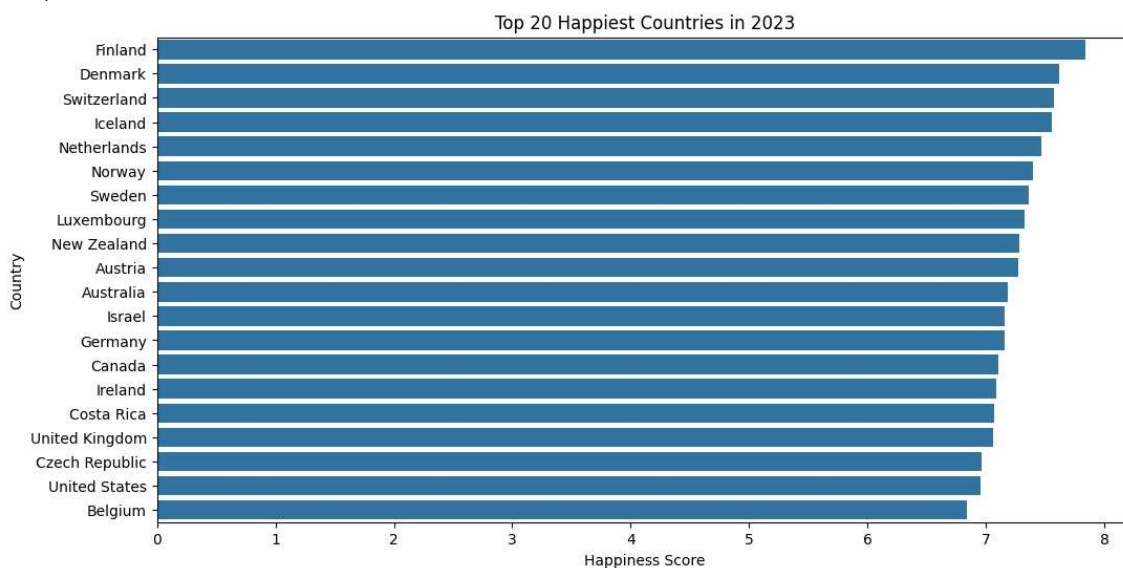


График – 9

Визуализация 1: Барная диаграмма (топ-20) • Функция sns.barplot из библиотеки seaborn используется для построения барной диаграммы.

- По оси X отображается "Happiness Score 2023".

- По оси Y отображается название страны ("Country").
- Данные отфильтрованы для отображения только топ-20 самых счастливых стран (метод `head(20)`).
- Заголовок диаграммы: "Top 20 Happiest Countries in 2023".
- Вывод (Визуализация 1):
- Данная барная диаграмма показывает 20 стран с самым высоким индексом счастья в 2023 году, согласно предоставленным данным.
- Финляндия занимает первое место, за ней следуют Дания и Швейцария.

Визуализация 2

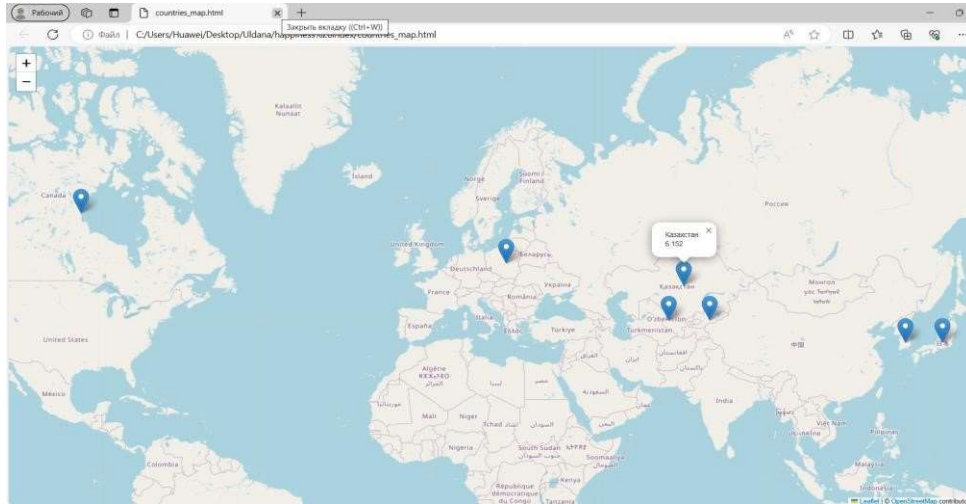


Рисунок – 3

Визуализация 2: Интерактивная карта мира

- Библиотека `folium` используется для создания интерактивной карты мира.
- Цикл `for` итерируется по каждой строке таблицы `df`.
- Для каждой страны создается маркер на карте мира с всплывающей подсказкой, отображающей название страны и ее индекс счастья.
- Карта сохраняется как `"happiness_map.html"`.
- Ограничения:
- Данные включают только 100 стран.
- Индекс счастья является субъективным показателем и может меняться со временем.
- Интерактивная карта мира является простой визуализацией и не учитывает факторы, влияющие на счастье.

Вывод:

Средний уровень счастья:

- Евросоюз: 6.58425925925926
- Евразийский экономический союз: 5.638
- Казахстан: 6.152

Анализ данных о средней зарплате:

- Средняя зарплата: 900 129 тенге.
- Страны с самой высокой зарплатой: Канада (2 207 859 тенге).
- Страны с самой низкой зарплатой: Кыргызстан (119 638 тенге).
- Вывод:
- Зарплата в Казахстане в 3,2 раза выше, чем в Кыргызстане.
- Зарплата в Канаде в 18,5 раза выше, чем в Кыргызстане.
- Средняя зарплата в развитых странах (Канада, Япония, Польша) в 2,4 раза выше, чем в странах СНГ (Казахстан, Кыргызстан, Узбекистан).

Визуализация 3.

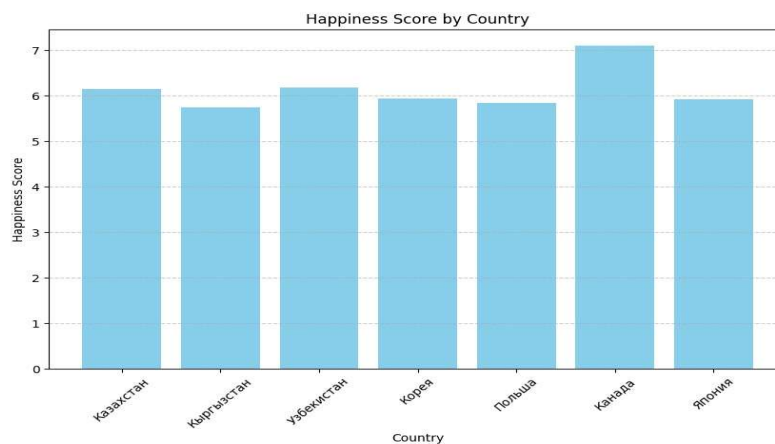


График- 10

Вывод

Визуальный анализ индекса счастья по странам:

- На представленной гистограмме отображено сравнение индекса счастья в семи странах: Казахстан, Кыргызстан, Узбекистан, Корея, Польша, Канада и Япония.
- Страны расположены на оси X.
- Индекс счастья представлен на оси Y.
- Канада имеет самый высокий столбец, что свидетельствует о самом высоком индексе счастья среди представленных стран.
- Кыргызстан имеет самый низкий столбец, демонстрируя самый низкий индекс счастья.
- Столбцы Казахстана, Узбекистана, Кореи, Польши и Японии имеют схожие значения, показывая средний уровень индекса счастья.

Визуализация 4.

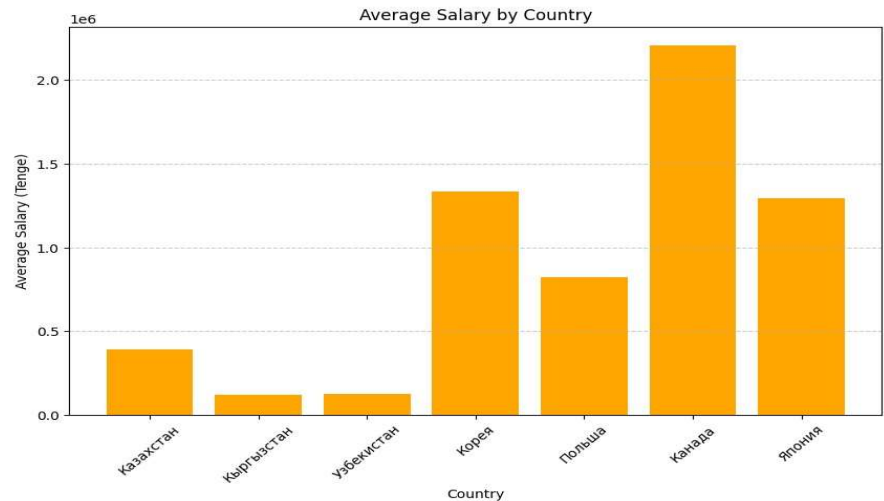


График- 11

Вывод

Визуальный анализ средней зарплаты по странам:

- Создана гистограмма для сравнения средней зарплаты в Казахстане, Кыргызстане, Узбекистане, Корее, Польше, Канаде и Японии.
- По оси X отображены названия стран.
- По оси Y отображена средняя заработная плата в тенге.
- Канада демонстрирует самый высокий столбец, указывая на значительно бóльшую среднюю зарплату по сравнению с другими странами.
- Кыргызстан имеет самый низкий столбец, показывая самую низкую среднюю зарплату среди представленных стран.
- Столбцы Казахстана, Узбекистана, Польши, Кореи и Японии имеют схожие значения, демонстрируя средний уровень зарплат.

Визуализация 5.

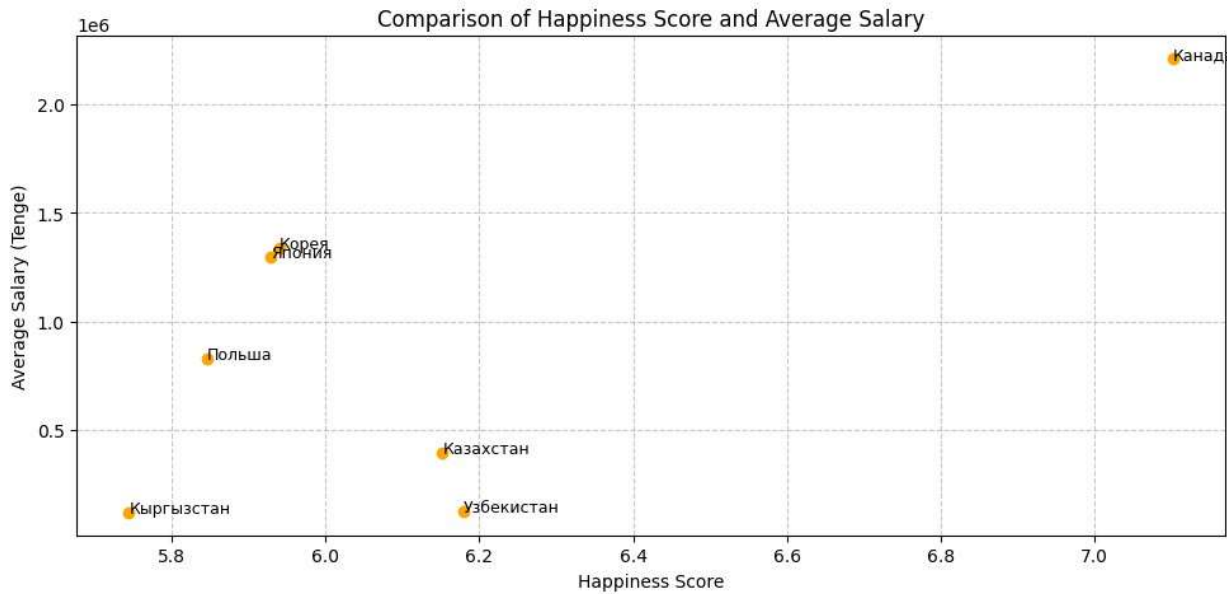


График- 12

Вывод

- Анализ взаимосвязи между индексом счастья и средней зарплатой:
- Данный scatter plot визуализирует взаимосвязь между индексом счастья и средней заработной платой в семи странах: Казахстан, Кыргызстан, Узбекистан, Корея, Польша, Канада и Япония.
- Каждая точка на графике представляет собой одну страну.
- По горизонтальной оси (X) откладывается индекс счастья.
- По вертикальной оси (Y) отображается средняя заработная плата в тенге.
- Страны обозначены рядом с соответствующими точками для облегчения идентификации.
- Наблюдения:
- Визуально не прослеживается четкой линейной зависимости между индексом счастья и средней зарплатой.
- Некоторые страны с высоким индексом счастья (например, Канада) также имеют высокую среднюю зарплату.
- Однако, страны со средним индексом счастья (например, Казахстан, Узбекистан, Польша) могут иметь как высокую, так и низкую среднюю зарплату.
- Аналогично, страны с низким индексом счастья (например, Кыргызстан) необязательно имеют низкую среднюю зарплату.

Заключение

Исходя из проведённого полного анализа данных, мы пришли к выводу, что существует прямая связь между средней заработной платой и качеством жизни. Также что средняя заработная плата не влияет напрямую на индекс счастья, а лишь является ее частью. Наше исследование показало, что увеличение заработной платы коррелирует с повышением уровня комфорта, удовлетворённости жизнью и доступности к основным потребностям.

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УДК 330.101.541

ВНЕШНЕЭКОНОМИЧЕСКАЯ АКТИВНОСТЬ И МАКРОЭКОНОМИЧЕСКИЕ ПОКАЗАТЕЛИ РК

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Аннотация: в статье проведен анализ внешнеэкономической активности и процессов привлечения иностранных инвестиций в Казахстан. Рассмотрены показатели внешнеторгового оборота страны, ключевые партнеры Казахстана в международной торговле, а также структура экспорта и импорта товаров и услуг. Определены актуальные тенденции во внешней торговле и обозначены приоритетные направления экономического развития для создания благоприятного делового климата. По результатам исследования дана оценка вовлеченности Казахстана в глобальную торговлю и выявлены основные тенденции иностранных инвестиций в стране.

Ключевые слова: экономика, макроэкономика, геополитика, инвестиции, сотрудничество, риски, торговля, рынок, оборот, динамика, ВВП, ЕАЭС

Abstract: the article analyzes foreign economic activity and processes of attracting foreign investment in Kazakhstan. The indicators of the country's foreign trade turnover, key partners of Kazakhstan in international trade, as well as the structure of exports and imports of goods and services are considered. Current trends in foreign trade are identified and priority areas of economic development for creating a favorable business climate are outlined. Based on the results of the study, an assessment is given of Kazakhstan's involvement in global trade and the main trends of foreign investment in the country are identified.

Keywords: economy, macroeconomics, geopolitics, investments, cooperation, risks, trade, market, turnover, dynamics, GDP, EAEU

Казахстан сегодня активно участвует в Евразийском экономическом союзе (ЕАЭС). Как и многие страны Центральной Азии, Казахстан имеет ограниченный внутренний рынок. Согласно данным Комитета по статистике, население страны немного превышает 20 миллионов человек, тогда как ЕАЭС обеспечивает доступ к рынку численностью 183 миллиона человек и совокупным ВВП свыше 1,8 триллиона долларов. Все это безусловно, повышает привлекательность стран-участниц для иностранных инвесторов. Вместе с тем, изменения в глобальной экономике, связанные с процессами глобализации, оказывают негативное воздействие на казахстанскую экономику, делая её более уязвимой. Обострились

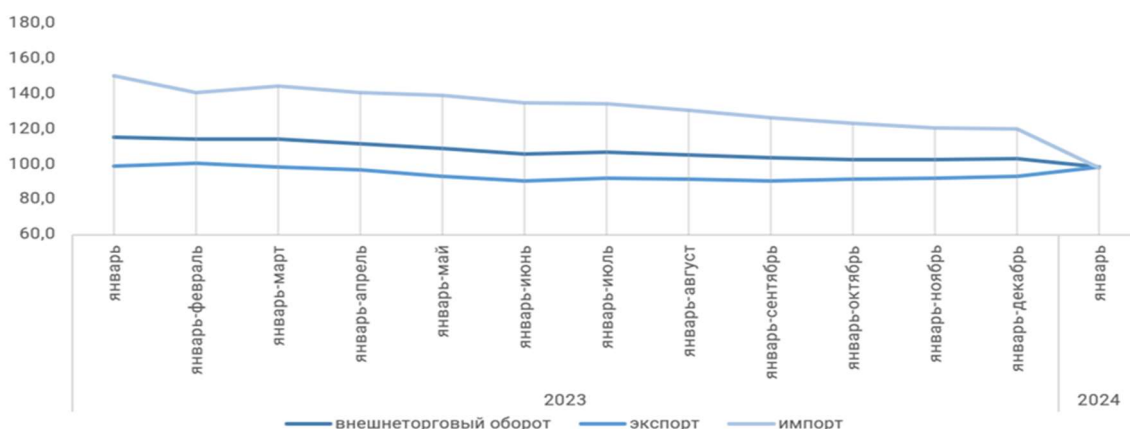
проблемы международной торговли, усилились негативные риски, наблюдается гонка вооружений среди ведущих мировых игроков, а также нестабильная геополитическая ситуация, что сказывается и на экономике Казахстана.

В последние годы Казахстан сосредоточил внимание на трех ключевых направлениях внешнеэкономического сотрудничества - с Европейским союзом, ЕАЭС (особенно с Россией) и Китаем, стремясь при этом повысить уровень своей экономической активности.

Однако в условиях глобальных изменений мировой экономики Казахстан сталкивается с растущими вызовами, что делает его экономику более уязвимой. Сегодня усиливаются проблемы международной торговли, растут негативные риски, обостряется гонка вооружений между крупнейшими мировыми державами, и сохраняется нестабильная геополитическая ситуация. Все эти факторы оказывают влияние и на казахстанскую экономику. Например, в 2024 году на фоне снижения деловой активности темпы роста реального ВВП Казахстана оставались незначительными, что привело к сокращению внешнеторгового оборота страны по сравнению с 2022 годом, а объем экспорта значительно снизился.

Эти факторы отрицательно повлияли на объёмы торговли, при этом слабая конкурентоспособность казахстанских товаров и недоразвитость реального сектора экономики ограничивают спрос на них, в том числе и со стороны стран ЕАЭС. Казахская экономика в значительной степени зависит от экспорта металлов и природных ресурсов, главным образом нефти.

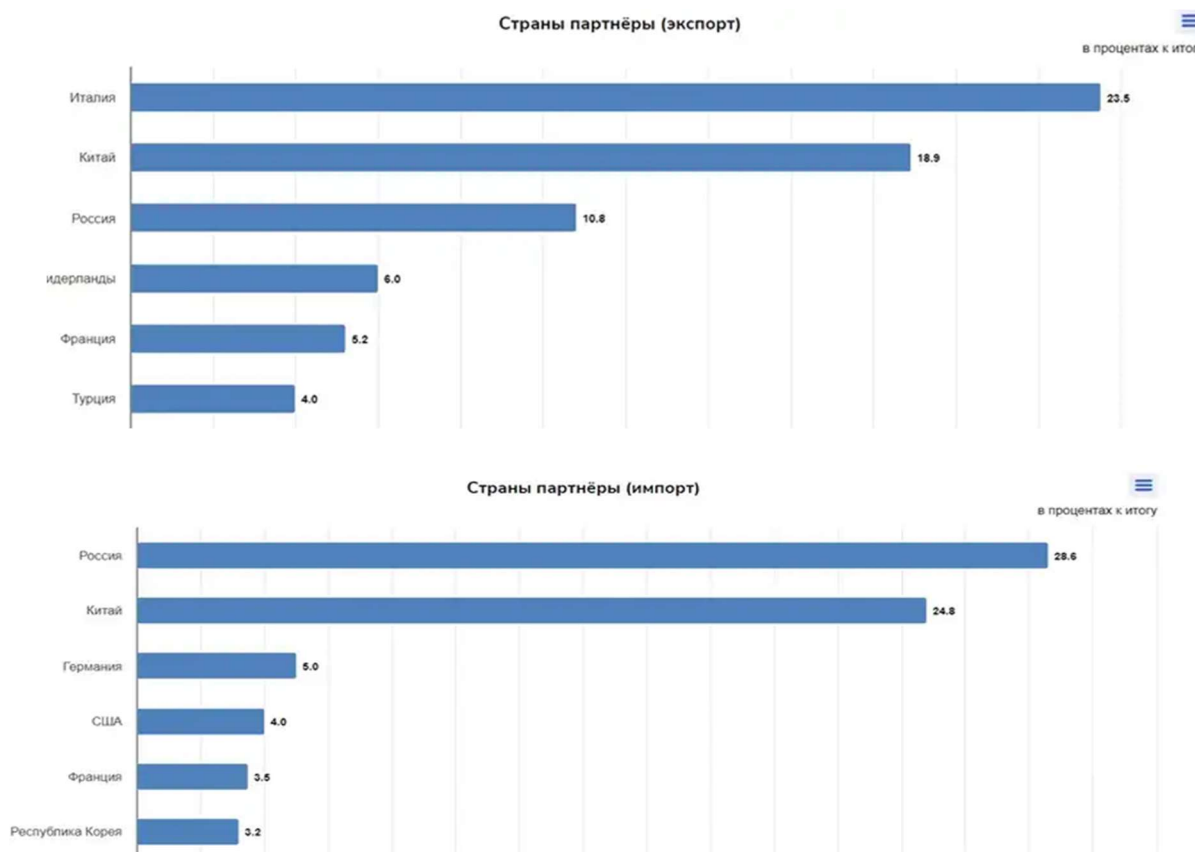
Динамика внешней торговли Казахстана в 2024 году демонстрирует довольно нетипичную картину по сравнению с предыдущими годами.



Примечание: данные бюро национальной статистики Агентства по стратегическому планированию и реформам РК // <https://stat.gov.kz>

С одной стороны, фиксируется снижение общего внешнеторгового оборота, но при этом внешнеторговое сальдо показывает незначительный, но рост. В течение года объем внешнеторгового оборота ни разу не превысил показатели предыдущего года. Так, за период с января по июль этот показатель оказался ниже аналогичного периода 2023 года на 1,8%, составив по предварительным данным 78,97 млрд долларов США. В абсолютных цифрах снижение объема внешней торговли составило 1,45 млрд долларов, согласно статистическим данным. Одной из причин этого стало снижение стоимости нефти марки Brent: с июньских максимумов средняя цена снизилась с 85,2 до 80,7 долларов за баррель в июле. С учетом того, что в августе цена опустилась до 76,9 доллара, а в сентябре – до 73,5 доллара, можно предположить, что до конца года положительных изменений в динамике внешнеторгового оборота ожидать не стоит.

Экспорт из Казахстана вырос всего на 2,2%, достигнув 46,13 млрд долларов. Однако этот небольшой рост обеспечен в основном за счет увеличения поставок в страны дальнего зарубежья на 6,6%, до 37,8 млрд долларов. При этом экспорт в государства СНГ уменьшился на 14,1%, составив 8,3 млрд долларов, а в страны ЕАЭС снизился на 15,9%, до 5,73 млрд долларов. Ключевой причиной этих отрицательных тенденций стало значительное сокращение экспорта в Россию - на 18%, до 5 млрд долларов.



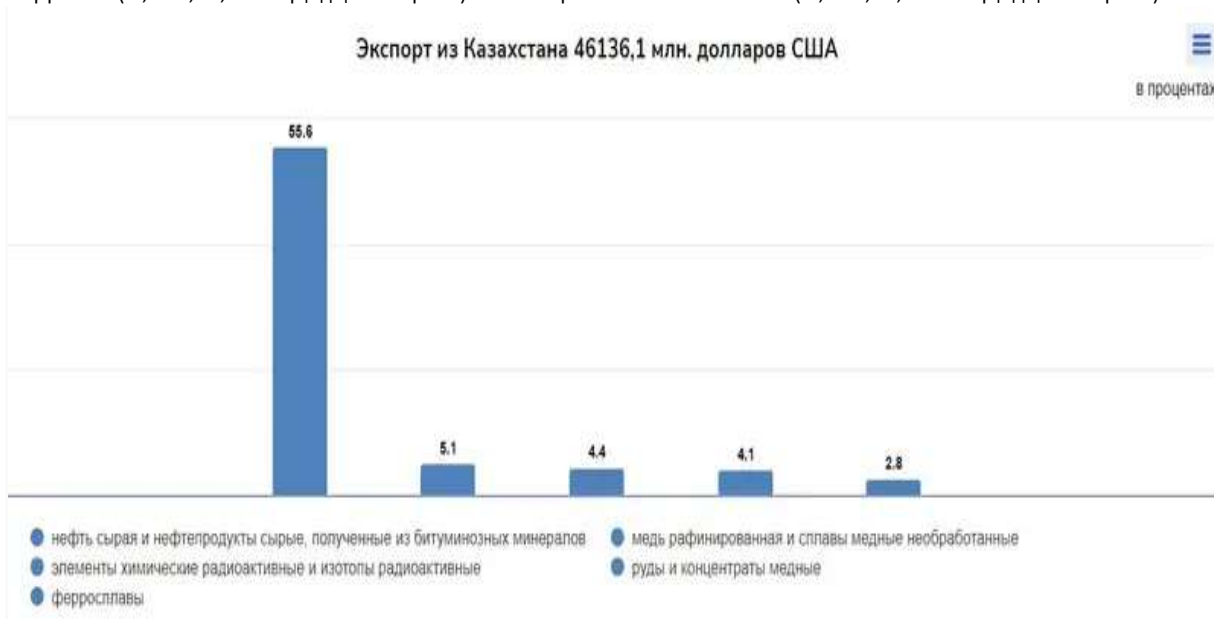
Примечание: данные бюро национальной статистики Агентства по стратегическому планированию и реформам РК // <https://stat.gov.kz>

Импорт из России также снизился, но менее значительно - на 2,9%, до 9,38 млрд долларов. Вследствие этого уменьшились и поставки из стран ЕАЭС (на 4%, до 10,6 млрд долларов) и СНГ (на 4,6%, до 11,2 млрд долларов). Поставки из стран дальнего зарубежья упали еще более ощутимо - на 8%, до 21,64 млрд долларов. В целом объем импорта зарубежных товаров в Казахстан сократился на 6,9%, составив 32,35 млрд долларов в этом году. Несмотря на то, что внешнеторговая динамика выглядит немного пессимистично, ее баланс или сальдо дебетовое, и растет впечатляющими темпами – на 34,6% или 13,3 млрд долл США.

Китай остается ведущим торговым партнером Казахстана, занимая 21,3% от общего товарооборота. В денежном выражении объем торговли с КНР за январь–июль составил 16,83 млрд долларов. На втором месте расположилась Россия (18,2%, 14,38 млрд долларов), а третью позицию занимает Италия с долей 14,7% и оборотом в 1,57 млрд долларов.

Лидером среди региональных партнеров остается Европейский союз, на долю которого приходится 35,4% от товарооборота Казахстана, или 27,92 млрд долларов. За ним следуют страны СНГ (24,7%, 19,5 млрд долларов) и ЕАЭС (20%, 15,8 млрд долларов).

С точки зрения географии, наибольшую долю занимает Европа (37,5%, 29,64 млрд долларов), затем идут Азия (33,3%, 26,26 млрд долларов), США (4%, 3,15 млрд долларов), Африка (0,5%, 0,4 млрд долларов) и Австралия и Океания (0,1%, 0,04 млрд долларов).



Примечание: данные бюро национальной статистики Агентства по стратегическому планированию и реформам РК // <https://stat.gov.kz>



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В структуре экспорта Казахстана существенных положительных изменений пока не наблюдается. Минеральные продукты занимают лидирующую позицию с долей 66,2%, из которых на топливно-энергетические товары приходится 58,9%. Значительно меньшие доли приходятся на металлы и изделия из них (13,3%), продукцию химической промышленности и смежных отраслей (7,3%), продовольственные товары, а также продукцию животного и растительного происхождения (5,6%), и машины, оборудование, транспортные средства и приборы (5,4%).

Среди ключевых экспортируемых товаров первое место стабильно удерживает сырая нефть и нефтепродукты из битуминозных минералов (55,6%). Далее следуют

рафинированная медь и необработанные медные сплавы (5,1%), радиоактивные элементы и изотопы (4,4%), медные руды и концентраты (4,1%), а также ферросплавы (2,8%).

В современной мировой экономике активно идёт конкуренция за привлечение прямых иностранных инвестиций (ПИИ), поскольку они играют важную роль в стимулировании экономического роста и раскрытии экономического потенциала стран.

Несмотря на значительное сокращение объёмов ПИИ (в среднем на 20%), развитые страны по-прежнему занимают лидирующие позиции как среди стран-инвесторов, так и среди стран-реципиентов. В начале 2000-х годов на развитые страны приходилось 82% импорта и 92% экспорта прямых инвестиций. Однако уже к 2016 году эти доли снизились до 59% и 72% соответственно. Это снижение связано с тем, что потоки ПИИ начали перераспределяться в пользу развивающихся стран, где основным получателем иностранного капитала стал Китай. Изначально он стал "мировой фабрикой", а позже – ведущим глобальным экспортёром товаров и услуг, обойдя по объёму экспорта США. В то же время Китай стал одним из крупнейших реципиентов ПИИ. Даже с учётом того, что около 40% ПИИ поступают из Гонконга и учитываются в статистике как иностранные, приток капитала из других стран остаётся значительным.

Сегодня тенденции инвестиционной политики остаются на уровне среднего пятилетнего показателя, да и общий баланс между благоприятными и менее благоприятными мерами остаются неизменными. Развивающиеся страны также в основном стремятся поощрять и облегчать инвестиции до 86 % от мировых инвестиций, тогда как развитые страны склоняются к более ограничительным мерам. Рынок устойчивого финансирования продолжает расти, но отмечаются явные признаки его замедления. В 2023 году стоимостной объем устойчивых инвестиционных продуктов, включающих облигации и фонды, вырос на 20 % и превысил 7 трлн долларов. Однако значительная часть этого роста была обусловлена накопленной эмиссией и повышением стоимостной оценки активов.

Правительства как развитых, так и развивающихся стран ускоряют разработку мер политики в области устойчивого финансирования. В 2023 году 35 стран, отслеживаемых ЮНКТАД и охватывающих крупнейшие финансовые рынки мира, ввели 94 новые меры и инициативы, тогда как в 2022 году число этих мер составило 63.

Казахстан также расширяет участие ПИИ в экономике, привлекая международное финансирование для проектов в области возобновляемой энергетики и устойчивого земледелия. Эти усилия способствуют созданию новых рабочих мест и ускоряют переход к экологически устойчивой модели экономического роста, что соответствует международным тенденциям и требованиям глобального рынка. Благодаря комплексному подходу к интеграции в мировую экономику, Казахстан укрепляет свои позиции как надежный партнер и перспективный рынок для международных инвесторов.

Несмотря на достигнутые успехи, Казахстан сталкивается с несколькими проблемами такими как снижение экспорта сырья, роста импортозависимости. Также, остается высокой зависимость от мировой конъюнктуры, что делает экономику Казахстана чувствительной к колебаниям цен на сырьевые товары и глобальным экономическим кризисам. Это подчеркивает необходимость создания устойчивой внутренней экономики, способной компенсировать влияние внешних факторов. Неравномерное региональное развитие: значительная концентрация инвестиций и экономической активности в крупных городах и нефтегазодобывающих регионах приводит к экономическим диспропорциям. Для устойчивого развития страны требуется сбалансированное распределение ресурсов и создание условий для роста в сельских и менее развитых регионах.

Внешнеэкономическая деятельность Казахстана в 2024 году покажет, как преимущества, так и недостатки. Укрепление экономического суверенитета и повышение конкурентоспособности страны требуют устойчивого привлечения инвестиций и успешной

интеграции в мировую экономику. Анализ внешнеторговой структуры Казахстана указывает на необходимость улучшения подходов к привлечению иностранных капиталов в реальный сектор экономики. Новые промышленные предприятия и перенесённые производства из других регионов мира нацелены на развитие реального сектора.

В последние годы, независимого Казахстана, активно интегрирующего в мировую экономику, важно привлекать иностранный капитал для модернизации экономики и укрепления позиций на международной арене. Ответ на вызовы требует последовательной стратегии развития во всех сферах, где приоритет остаётся за привлечением иностранных инвестиций, а также за улучшением социального благополучия, как указано в долгосрочной стратегии развития «Казахстан – 2050» и Плана нации. Кроме того, в Послание Главы государства Касым-Жомарта Токаева народу Казахстана в сентябре 2024 года также было отмечено о необходимо серьезно активизировать работу по привлечению прямых иностранных инвестиций, без которых резервы дальнейшего роста экономики будут ограничены.

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Экологиялық туризмнің дамуы: Зеренді аймағы және тұрақтылықтың өзекті мәселелері

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Зеренді – Қазақстанның бай табиғи және мәдени мұрасы бар бірегей бұрышы. Соңғы жылдары бұл аймақ өзінің көркем ландшафтымен, флора мен фаунаның алуан түрлілігімен, сондай-ақ белсенді демалу мүмкіндіктерімен туристердің назарын арттырып келеді. Дегенмен, Зерендіге деген қызығушылықтың артуы қоршаған ортаның жай-күйі мен туризмнің тұрақты дамуы туралы маңызды сұрақтарды да тудырады.

Қазақстанның көркем бұрышында орналасқан Зеренді бірегей табиғи ресурстары мен биотасының алуан түрлілігі бар маңызды туристік және экологиялық объект болып табылады. Соңғы жылдары бұл аймақ туристер арасында танымал бола бастады, бұл өз кезегінде оның экологиялық жағдайын және өсіп келе жатқан антропогендік қысымға төзімділігін талдау қажеттілігін тудырады. Бұл аймақ өзінің көркем ландшафттарымен, таза суымен және бай биоәртүрлілігімен танымал, бұл оны жергілікті тұрғындар мен туристер үшін тартымды орынға айналдырады. Соңғы жылдары экологиялық туризм мен ашық ауада белсенділіктің дамуына байланысты Зерендіге қызығушылық айтарлықтай артты. Алайда, айқын артықшылықтарға қарамастан, туристік белсенділіктің бұл артуы аймақтың экожүйелері үшін белгілі бір қиындықтарды тудырады. Келушілер санының артуы табиғи ресурстарға антропогендік қысымға алып келеді, бұл қоршаған ортаға теріс әсер етіп, жергілікті флора мен фаунаның тепе-теңдігін бұзуы мүмкін. Туризмді дұрыс басқару мен қоршаған ортаны қорғау қатар жүруі керек екенін түсіну маңызды.

Тақырыптың өзектілігі: Зеренді аймағының экологиялық жағдайы, туристер санын көбейту үшін атқарылатын жұмыстар, дамыту бойынша ұсыныстар, инфрақұрылымы.

Жұмыстың мақсаты - Зерендінің қазіргі туристік экологиялық жағдайын талдау, туристік белсенділіктің өсуіне байланысты негізгі экологиялық проблемаларды анықтау және оларды шешу бойынша ұсыныстарды ұсыну болып табылады. Климаттың жаһандық өзгеруі және табиғи экожүйелерге антропогендік қысымның күшеюі жағдайында Зерендінің экологиялық жағдайын зерттеу өзекті болып отыр, өйткені ол ұқсас жағдайлары бар басқа аймақтарға үлгі бола алады.

Зерттеу объектісі: Зерендінің табиғи ресурстары мен экожүйелері, сонымен қатар туризмді дамытуға байланысты әлеуметтік-экономикалық аспектілері зерттеу жұмысымыздың нысаны болып табылады. Бұл мәселені зерттеу осы аймақта қоршаған ортаны қорғау және тұрақты туризм стратегиясын қалыптастыру үшін маңызды мәнге ие.

Зеренді ауданының экологиялық жағдайы мен тұрақтылығы соңғы жылдары ерекше назарға алынуда. Бұл өңірдің экологиялық жағдайына әсер ететін бірнеше факторлар бар.

Зеренді ауданының су ресурстары, әсіресе, Зеренді көлінің маңызы зор. Көл экожүйесі жергілікті фауна мен флораның тұрақтылығын сақтауға мүмкіндік береді. Дегенмен, су деңгейінің төмендеуі мен ластануы экологиялық проблемалар тудырып отыр. Мысалы, ауыл шаруашылығының дамуы судың ластануына әсер етеді, себебі тыңайтқыштар мен пестицидтердің қолданылуы су көздеріне түседі.

Зерендінің ауа сапасына тоқталсақ, ауаның ластануы - тағы бір маңызды мәселе. Ауыл шаруашылығы мен өндіріс орындары emissions шығарады, бұл экологиялық теңгерімді бұзады. Зеренді ауданында көктемгі дала жұмыстары кезінде топырақтан ұшып кететін шаң мен бөлшектер ауа сапасын нашарлатады.

Зерендінің топырақ құнарлылығы ең маңызды құрылымы болып келеді.

Зеренді аймағының топырағы ауыл шаруашылығы үшін қолайлы, бірақ дұрыс агротехникалық шаралардың болмауы оның құнарлылығын төмендетеді. Мысалы, монокультура әдісінің кеңінен қолданылуы топырақтың эрозиясына әкеледі. Бұл жағдайды түзету үшін агрономдар топырақты қалпына келтіру мен егіс айналымын енгізу сияқты шараларды ұсынып отыр.

Зерендінің табиғи экосистемаларына аудандағы табиғи экосистемалар, мысалы, ормандар мен шөптесін жерлер, биоалуантүрлілікті сақтау үшін маңызды. Ормандар оттегінің өндірісіне және көміртегінің қорытылуына ықпал етеді. Бірақ, орман алқаптарының қысқаруы, негізінен, адам әрекетімен байланысты, экологиялық теңгерімді бұзады.

Зерендінің экологиялық жобалары мен бастамалары

Зеренді ауданында экологиялық тұрақтылықты қамтамасыз ету үшін түрлі жобалар мен бастамалар іске асырылуда. Мысалы, "жасыл экономика" тұжырымдамасы аясында энергияның жаңартылатын көздерін дамыту, ағаш отырғызу акциялары және экологиялық білім беру бағдарламалары енгізілуде. Зеренді ауданының экологиялық жағдайы тұрақтылықты қамтамасыз ету үшін назар аударуды қажет етеді. Су ресурстарын, ауаны, топырақты қорғау және экожүйелерді сақтау бағытында қабылданған шаралар болашақта осы өңірдің экологиялық тепе-теңдігін сақтауға мүмкіндік береді. Тек қоғамдық және мемлекеттік деңгейде бірлесе отырып жұмыс істегенде ғана біз Зеренді ауданындағы экологиялық мәселелерді тиімді шешуге қол жеткізе аламыз.

Зеренді ауданындағы экологиялық жағдай мен тұрақтылық мәселелерін тереңірек талдайық.

Зерендінің климаттық өзгерістері.

Климаттық өзгерістер Зеренді ауданының экологиялық тұрақтылығына үлкен әсер етуде. Соңғы жылдары температураның көтерілуі мен жауын-шашын мөлшерінің өзгеруі ауыл шаруашылығы өнімдерінің өнімділігіне әсер етеді. Мысалы, 2019 жылы жаз айларында аномальды ыстық ауа райы бидай өнімдерінің түсімін төмендеткені байқалды.

Зерендінің қоршаған ортаға әсер ететін өндіріс ретінде аудандағы кейбір өндіріс орындары экологиялық нормаларды сақтамауы салдарынан ауа мен суды ластайды. Мысалы, зауыттардың шығарындылары мен өндіріс қалдықтары табиғи ресурстарға зиян келтіріп, экологиялық теңгерімді бұзады. Бұл мәселені шешу үшін өндіріс орындарына экологиялық стандарттарды енгізу қажет.

Зеренді ауыл шаруашылығының экологиялық аспектілері

Ауыл шаруашылығы Зеренді ауданының экономикасында маңызды рөл атқарады, бірақ оның экологиялық аспектілері назардан тыс қалмауы тиіс. Тыңайтқыштарды шамадан тыс қолдану топырақтың улануына, ал зиянкестерге қарсы химиялық заттардың пайдаланылуы экожүйенің биоалуантүрлілігін төмендетуге әкеледі. Ауыл шаруашылығында экологиялық таза технологияларды енгізу, мысалы, органикалық егіншілік, осы мәселелерді шешуге көмектесуі мүмкін.

Қоғамдық экологиялық бастамалары кезінде Зеренді ауданында экологиялық білім мен тәрбиені насихаттау бойынша жұмыстар жүргізілуде. Мектептерде экологиялық клубтар мен жобалар ұйымдастырылып, жастарға табиғатты қорғау туралы білім берілуде. Бұл бастамалар жастардың экологиялық сауаттылығын арттырып, оларды табиғатқа жауапкершілікпен қарауға тәрбиелейді.

Зерендіде мемлекеттік бағдарламалар

Қазақстан Республикасының экологиялық саясатында Зеренді ауданына бағытталған арнайы бағдарламалар бар. «Экология» мемлекеттік бағдарламасы аясында табиғат қорғау шаралары, экологиялық мониторинг жүргізу және табиғи ресурстарды тиімді пайдалану мақсатында жобалар іске асырылуда. Бұл бағдарламалар экологиялық жағдайды жақсартуға, сондай-ақ халықтың өмір сүру сапасын арттыруға бағытталған. Зеренді ауданындағы экологиялық жағдай күрделі, бірақ оны жақсарту үшін түрлі шаралар мен бастамалар бар. Экологиялық тұрақтылықты қамтамасыз ету үшін, қоғам, мемлекет және жеке сектор бірігіп жұмыс істеп, табиғи ресурстарды қорғауға бағытталған стратегияларды жүзеге асыруы керек. Тек осылайша, біз Зеренді ауданында экологиялық тепе-теңдікті сақтап, болашақ ұрпаққа таза және сау орта қалдыра аламыз.

Қазақстанның орталық бөлігінде орналасқан Зеренді ауданы табиғи сұлулығымен, мәдени мұрасы мен тарихи маңызымен ерекше үйлеседі. Аймақ туристерді өзінің көркем ландшафттарымен ғана емес, сонымен қатар ашық ауада серуендеу, экотуризм және мәдени алмасу мүмкіндіктерімен де тартады. Бұл әссе Зеренді өңірінің туристік әлеуетін, оның ішінде оның табиғи ресурстарын, мәдени аспектілерін және туризмге қызығушылықтың артуы жағдайында аймақтың тап болатын мәселелерін қарастырады.

Табиғи ресурстар мен ландшафттар жайлы айтатын болсақ, Зеренді өңірі Қазақстандағы орталық орынды алады және ормандары, таулары, көлдері мен далалары сияқты алуан түрлі ландшафтқа ие. Бұл туризмнің әртүрлі түрлерін дамыту үшін бірегей жағдайлар жасайды. Зеренді және Торғай көлдері сияқты су қоймалары маңызды демалыс және балық аулау орындары болып табылады, ал айналадағы ормандар мен тау жоталары жаяу және альпинизмге мүмкіндік береді. Зеренді аймағының климаты қалыпты континенттік, қысы суық, жазы жылы. Бұл әр маусымда өңірге келуге қолайлы жағдай туғызады. Жаз айлары ашық ауада серуендеуге қолайлы, ал қыста шаңғы тебуге болады.

Зеренді биоәртүрлілікке бай. Аудандағы ормандарда жануарлардың әртүрлі түрлері, соның ішінде сирек кездесетін және жойылып бара жатқандар мекендейді. Бұл табиғат әуесқойлары мен құстарды бақылаушыларды тартады, экотуризм мен жабайы табиғатты тамашалауға мүмкіндік береді.

Тарихи мұра-Зеренді өңірінің бай тарихы бар, оған археологиялық олжалар мен тарихи ескерткіштер дәлел. Ұрпақтан ұрпаққа жалғасып келе жатқан жергілікті мәдени дәстүрлер мен әдет-ғұрыптар мәдени туризмді дамытуға қолайлы бірегей атмосфераны қалыптастырады.

Түрлі этностардан тұратын жергілікті халық өзінің салт-дәстүрін, әдет-ғұрпын сақтап қалды. Туристер фестивальдерге, қолөнер сабақтарына және тағам турларына қатысу арқылы жергілікті мәдениетті сезіне алады. Бұл мәдени алмасу үшін бірегей мүмкіндіктер жасайды және аймаққа қызығушылықты арттырады. Көлік инфрақұрылымы Туризмнің табысты дамуы үшін жақсы дамыған көлік инфрақұрылымы қажет. Зеренді ауданының Қазақстанның ірі қалаларымен жеткілікті автокөлік қатынасы бар, бұл оның табиғи және мәдени көрікті жерлеріне қолжетімділікті жеңілдетеді. Қоғамдық көлік пен ыңғайлы маршруттардың дамуы да туристерді тартуға септігін тигізеді. Туристік қызметтер: Қонақ үйлердің, кемпингтердің, мейрамханалардың және туристік агенттіктердің болуы туризм инфрақұрылымының маңызды аспектісі болып табылады. Зеренді өңірінде туристік нысандар санының артуы байқалады, бұл өңірге қызығушылықтың артқанын көрсетеді.

Дегенмен, туристердің сұранысын қанағаттандыру үшін жоғары сапалы қызмет көрсету маңызды. Экологиялық қауіптерде өте үлкен рөл ойнайды. Туристік ағынның артуымен қоршаған ортаға кері әсер ету қаупі бар. Ластану, табиғи экожүйелердің бұзылуы және ландшафттың өзгеруі табиғи мұраның жоғалуына әкелуі мүмкін. Сондықтан табиғи ресурстарды тұрақты басқару және қоршаған ортаны қорғау стратегияларын әзірлеу қажет.

Әлеуметтік-экономикалық аспектілері.

Туризмнің дамуы жергілікті халықтың өмір салтының өзгеруіне әкелуі мүмкін. Жанжалдарды болдырмау және аймақтың тұрақты дамуын қамтамасыз ету үшін туристер мен жергілікті тұрғындардың мүдделерін теңестіру маңызды. Білім беру және жергілікті қауымдастықтарды туристік бастамаларға тарту осы мақсатқа жетудің негізгі аспектілері болып табылады. Зеренді өңірінде туризмді дамытудың негізгі бағыттарының бірі тұрақты туризм қағидаттарын енгізу болуы тиіс. Бұған қоршаған ортаға әсерді азайту, жергілікті экономиканы қолдау және жергілікті халықты туристік қызметке тарту кіреді.

Экотуризмді дамыту - Табиғи ресурстардың байлығын ескере отырып, Зерендінің Қазақстандағы экотуризм орталығына айналуға толық мүмкіндігі бар. Қорықтар мен ерекше қорғалатын табиғи аумақтарды, сондай-ақ жаяу серуендеуге және жануарларды бақылауға арналған маршруттарды құру экология мен табиғатқа қызығушылық танытатын туристердің назарын аударуы мүмкін. Жергілікті дәстүр мен тарихқа негізделген мәдени туризмді дамытудың да әлеуеті зор. Білім беру бағдарламаларын, семинарлар мен фестивальдерді құру аймақтың мәдениетін тереңірек түсінгісі келетін туристерді тарта алады. Зеренді аймағы табиғи сұлулығымен, мәдени мұрасымен және қолжетімді инфрақұрылымымен маңызды туристік әлеуетке ие. Алайда оның тиімді дамуы үшін экологиялық, әлеуметтік және экономикалық аспектілерді ескеру қажет. Тұрақты туризм қағидаттарын енгізу, экотуризм мен мәдени алмасуды дамыту Зерендіні туристер үшін тартымды орынға айналдырып, болашақ ұрпақ үшін оның бірегей мұрасын сақтауға көмектеседі.

Осылайша, Зеренді туристік қызметтің орталығына айналып қана қоймай, табиғат пен адамның табысты өмір сүруінің үлгісі бола алады.

Әдеби шолу: Зерттеу жұмысы барысында курорттық аймақтар мен олардың дамуы туралы американдық жазушылардың көзқарастарына әдеби шолу жүргіздік.

Американдық әдебиетте курорттық аймақтар мен олардың даму мәселелері әртүрлі бағыттарда қарастырылып, қоғамның әлеуметтік, экономикалық және мәдени аспектілерін сипаттауда маңызды рөл атқарды. Курорттар көбінесе американдық қоғамдағы тұтынушылық мәдениет, қоғамның әлеуметтік жіктелуі және табиғатпен қарым-қатынасты бейнелеу тәсілдері арқылы көрініс тапты. Бұл әдеби шолу американдық жазушылардың курорттық аймақтар мен олардың даму мәселесіне қатысты ой-пікірлерін зерделеуге арналған.

Табиғат пен адамдар арасындағы қарым-қатынас.

Курорттық аймақтар көбінесе табиғаттың ерекше сұлулығымен, тыныштықпен және қаланың қарбаласынан алыс орналасқанымен танымал. Мұндай аймақтар туралы жазушылар көп жағдайда табиғаттың адамға әсерін зерттеу арқылы оның физикалық және рухани сауықтыру қасиеттерін сипаттаған. Мысалы, Ф. Скотт Фицджеральд өзінің атақты ғылыми жобасында "Ұлы Гэтсби" (2008) арқылы курорттық аймақтардың әлеуметтік деңгейлерді бөлетін жерлер ретінде сипаттайды. Бұл романда ол Нью-Йоркке жақын орналасқан зәулім виллалар мен курорттық қалашықтарда өтетін түрлі әлеуметтік оқиғаларды суреттейді. Жазушы қоғамның жоғарғы және төменгі таптарының арасындағы айырмашылықты көрсетіп, курорттық аймақтардағы өмір салты мен адамдар арасындағы қарама-қайшылықтарды ашады.

Зеренді ауданы – табиғи сұлулығы мен экологиялық ерекшеліктерімен танымал, әрі туристік әлеуеті зор өңір. Аудандағы туристік инфрақұрылым соңғы жылдары қарқынды дамып келеді, бірақ әлі де жетілдіруді қажет етеді.

Туризмнің негізгі тартымдылығына тоқталайық.

Зеренді ауданының басты туристік нысандары – Зеренді көлдері, ормандар, және тау-кен массивтері. Зеренді көлінің маңында демалыс орындары мен жағажайлар орналасқан, олар жазғы демалыс үшін өте ыңғайлы. Мысалы, "Зеренді" демалыс аймағы жыл сайын жүздеген туристі қабылдайды, мұнда су спорты, балық аулау, және табиғатпен жақын танысу мүмкіндіктері ұсынылады.

Аудандағы туристік қызмет көрсету саласы әр түрлі бағыттарда дамуда. Гидтер мен экскурсоводтар, сонымен қатар, қонақ үйлер мен пансионаттар қызмет көрсетеді. Мысалы, "Кемпинг Зеренді" және "Сарыарқа" қонақ үйлері туристерге жоғары деңгейдегі қызмет көрсетіп, ыңғайлы тұру жағдайларын қамтамасыз етеді.

Транспорттық инфрақұрылым да туристік инфрақұрылымның маңызды бөлігін құрайды. Зеренді ауданына жету үшін көлік жолдарының жағдайы және қоғамдық транспорттың жұмыс істеуі маңызды. Ауданға жақын орналасқан Көкшетау қаласынан автобус және такси қызметтері бар. Дегенмен, кейбір жолдардың жағдайы жақсартуды талап етеді.

Экологиялық туризм тұрғысында Зеренді ауданы экологиялық туризм үшін тамаша жағдайлар ұсынады. Ормандар мен көлдер табиғаттың әсемдігін тамашалауға, жаяу серуендеуге және аңшылыққа мүмкіндік береді. Экологиялық маршруттар мен турлар ұйымдастыру арқылы, мысалы, табиғатқа саяхат, туристерге экологиялық білім беру шаралары жүзеге асырылуда.

Зеренді ауданында тарихи ескерткіштер мен мәдени нысандар да бар. Аудандағы ұлттық мәдениет пен дәстүрлерді көрсету мақсатында фестивальдар мен көрмелер ұйымдастырылады. Мысалы, "Зеренді жәрмеңкесі" сияқты іс-шаралар жергілікті өнімдерді, қолөнерді және дәстүрлі мәдениетті насихаттауға арналған.

Туризмді дамытуға кедергі келтіретін факторларды қарастырсақ, Зеренді ауданының туристік инфрақұрылымын дамытуға кедергі келтіретін бірнеше факторлар бар. Біріншіден, қаржылық ресурстардың тапшылығы мен инвестициялардың жеткіліксіздігі. Екіншіден, туристік қызмет көрсету сапасының әркелкілігі мен инфрақұрылымның біртекті болмауы. Сонымен қатар, экологиялық мәселелер мен табиғи ресурстарды сақтау да маңызды.

Зерендінің болашақтағы даму мүмкіндіктеріне келсек, Зеренді ауданында туризмді дамыту үшін бірнеше стратегиялық бағыттар анықталуда. Туристік маршруттарды жаңарту, экологиялық таза технологияларды енгізу, инфрақұрылымды жақсарту және туристік маркетингті белсенді жүргізу. Жергілікті билік пен бизнес арасындағы серіктестікті нығайту арқылы ауданның туристік тартымдылығын арттыруға мүмкіндік бар.

Зеренді ауданының туристік инфрақұрылымы даму үстінде, бірақ оның әлеуеті зор. Ауданның табиғи сұлулығы, мәдени ерекшеліктері мен экологиялық жағдайлары туризмді дамытуға тамаша негіз береді. Келешекте туристік қызметтердің сапасын арттыру және инфрақұрылымды жаңарту арқылы Зеренді ауданын Қазақстандағы маңызды туристік бағыттардың біріне айналдыруға болады. Осы мақсаттарды ескере отырып Зеренді аймағына SWOT талдау жасау арқылы дамуы мен ерекшеліктерін қарастырдық.

1-кесте Зеренді аймағына SWOT талдау



*Авторлармен құрастырылған

Зерендіде экотуризмді дамыту үшін инфрақұрылым мен қызмет көрсету сапасын жақсарту қажет. Зеренді ауданы экотуризмді дамыту үшін үлкен әлеуетке ие, бірақ инфрақұрылым мен қызмет көрсету сапасын арттыру, экологиялық тұрақтылықты сақтау және туризмді тиімді басқару қажеттілігі бар. Ауданның экотуризм саласының толық дамуы жергілікті халықтың қатысуымен және мемлекеттік қолдау арқылы жүзеге асуы мүмкін. Сонымен қатар, экологиялық тұрақтылықты сақтап, инфрақұрылымдық мәселелерді шешу арқылы Зеренді экотуризмнің жаңа орталығына айнала алады. Сондай-ақ, жергілікті тұрғындарды тарту және туризмді дамытуға арналған жобалар мен бағдарламалар әзірлеу маңызды. Екі экологиялық мәні бар аймақтың ауқымы мен деңгейін, ерекшелігін ескере отырып, Бурабай курорттық демалу орнын даму сатысында деп болжауға болады. Алайда болашақта пайда болу мәселелерін алдын-ала ескерген дұрыс. Ал Зеренді екеуіне экологиялық туризм жағынан ұсыныс қоса аламыз. Олар 1 суретте көрсетілген.

1-сурет Зеренді аумағындағы пайда болу мәселелері



*Авторлармен құрастырылған

Экономикалық қиындықтар (инфляция, экономикалық дағдарыс) туристік салаға теріс әсер етуі мүмкін. Бұл жағдайлар туристердің санының азаюына және аймақтағы туризмнің қысқаруына әкеледі. Бурабайдың туристік нарығы Алматы, Шығыс Қазақстан облысы және басқа курорттық аймақтармен бәсекелес болуы мүмкін. Бұл бәсекелестік Бурабайдың туристік тартымдылығын төмендетіп, туристердің басқа жерлерді таңдауына әсер етуі ықтимал. Орталық Азия мен Ресейден келген туристердің саны артқан сайын, шетелдік курорттар мен туристік бағыттар да бәсекелестікке себеп болуы мүмкін. Бұл шетелдік нарықтардағы бәсекелестікті ескеру қажеттілігін арттырады. Сонымен қатар туризмді дамыту үшін жаңа қонақүйлер мен демалыс орындарын салу қажеттілігі туындауы мүмкін. Бірақ экологиялық аспектілерді ескермей жүргізілген құрылыс жұмыстары табиғатты бүлдіріп, аймақтың экологиялық балансына кері әсер етуі мүмкін. Туризмді дамыту үшін жергілікті тұрғындардың кәсіби дайындықтары мен экотуризмге бағытталған бастамаларды көтеру маңызды. Табиғи апаттарды да атап өткен болатынбыз. Табиғи апаттар (орман өрттері, су тасқындары) Бурабайдағы экосистеманы қатты бүлдіріп, туризмнің дамуына кері әсер етуі мүмкін. Мұндай апаттар туристердің келуіне тікелей әсер етуі ықтимал.

Қазақстанның көрікті түкпірінде орналасқан Зеренді өзінің табиғаты, мәдениеті мен тарихи мұрасының арқасында бірегей туристік әлеуетке ие. Дегенмен, бұл әлеуеттен максималды пайдаға қол жеткізу үшін туризмнің әртүрлі түрлерін, соның ішінде экологиялық туризмді дамыту бойынша стратегиялық ұсыныстарды әзірлеу және енгізу қажет. Туристік инфрақұрылымның тұрақты дамуына және Зерендіге туристерді тартуға ықпал ете алатын негізгі бағыттар мен нақты бастамалар қарастырамыз.

1. Қонақ үй қызметтерін дамыту

Қонақ үйлерден кемпингтерге дейін әртүрлі орналастыру нұсқаларын жасау қажеттілігі туристердің әртүрлі топтарын тартуға көмектеседі. Экологиялық таза технологияларды пайдаланатын экоқонақ үйлердің ашылуы экологиялық туризмді дамытудың негізгі нүктесі бола алады.

2. Ақпараттық орталықтарды ұйымдастыру

Туристер карталарды, маршруттар мен экскурсиялар туралы ақпаратты және қауіпсіздік бойынша кеңестерді ала алатын ақпараттық орталықтарды құру туристік тәжірибе мен қауіпсіздікті жақсартуға көмектеседі.

3. Ерекше қорғалатын табиғи аумақтарды құру

Табиғи мұраны сақтау үшін экожүйелердің ластануына және бұзылуына ықпал ететін іс-әрекеттерге тыйым салынатын немесе шектелетін қорғалатын аумақтарды бөлу қажет. Бұл қорықтар мен табиғи саябақтарды құруды қамтуы мүмкін.

4. Экотуризм бағдарламалары

Арнайы экотуризм бағдарламаларын әзірлеу, соның ішінде жабайы табиғатты тамашалауға арналған экскурсиялар, фотосафарлар және экологиялық танымдық турлар табиғатқа қызығушылық танытатын мақсатты аудиторияны тартуға көмектеседі.

5. Жергілікті халықты оқыту

Тұрақты туризм, қоршаған ортаны қорғау және туристермен жұмыс жасау мәселелері бойынша жергілікті тұрғындар үшін курстар мен семинарлар ұйымдастыру олардың туристік қызметке тартылуына және жаңа жұмыс орындарын ашуға ықпал етеді.

6. Мәдени алмасу бағдарламалары

Туристерге жергілікті мерекелер мен дәстүрлерге қатысуға мүмкіндік беретін бағдарламаларды жасау, мысалы, қолөнер сабақтары немесе аспаздық сабақтары туристер мен жергілікті тұрғындар арасындағы байланысты нығайтады.

7. Мәдени мерекелерді құру

Өңірдің мәдениеті мен өнеріне арналған жыл сайынғы фестивальдерді ұйымдастыру жергілікті тұрғындардың да, туристердің де назарын аударуға көмектеседі. Фестивальдерге көрмелер, концерттер, жәрмеңкелер және спорттық іс-шаралар кіруі мүмкін.

8. Веб-портал құру

Туристер Зеренді туралы ақпаратты, соның ішінде туристік маршруттарды, орналастыру нұсқаларын, мәдени іс-шараларды және қауіпсіздік бойынша кеңестерді таба алатын заманауи веб-порталды әзірлеу ақпараттың қолжетімділігін айтарлықтай жақсартады.

Зерендіде туризмді, оның ішінде экотуризмді дамыту табиғи және мәдени мұраны сақтауға, тұрақты инфрақұрылымды құруға және жергілікті халықты туристік қызметке тартуға бағытталған кешенді тәсілді қажет етеді. Ұсынылған бастамалар мен бағдарламаларды іске асыру өңірдің туристік әлеуетін дамытуға ғана емес, сонымен қатар жергілікті тұрғындардың өмір сүру сапасын жақсартуға, жаңа жұмыс орындарын құруға және Зеренді ауданының экономикалық тұрақтылығын нығайтуға ықпал етеді. Осылайша, Зеренді Қазақстандағы табысты және тұрақты туристік бағыттың үлгілі үлгісі бола алады.

Қорыта келе, Зерендідегі туризмді дамыту – өңірдің экономикалық және әлеуметтік жағдайын айтарлықтай жақсарту алатын перспективалы бағыт. Зеренді өңірінің туристік әлеуетін зерделеу оның бірегей табиғи ресурстары, бай мәдени мұрасы және қолайлы климаттық жағдайлары туризмнің әртүрлі түрлеріне, соның ішінде экотуризмге, мәдени және белсенді демалысқа тамаша мүмкіндіктер туғызатынын көрсетті. Дегенмен, туризмнен максималды пайда алу үшін бірқатар факторларды ескеру қажет.

Біріншіден, жолдарды, қонақ үйлерді, ақпараттық орталықтарды және туристік маршруттарды қоса алғанда, сапалы инфрақұрылымды құру қажет. Мұндай нысандарды дамыту туристердің жайлылығын арттырып қана қоймай, жергілікті экономиканың тұрақты дамуын қамтамасыз етеді.

Екіншіден, қоршаған орта мен мәдени мұраны сақтауға бағытталған тұрақты туризм қағидаттарын енгізу қажет. Ерекше қорғалатын табиғи аумақтар мен экотуризм

бағдарламаларын құру табиғатқа тигізетін теріс әсерді барынша азайтуға және биологиялық әртүрлілікті сақтауға көмектеседі.

Жергілікті халықты туристік қызметке тарту да маңызды аспект болып табылады. Жергілікті тұрғындарды туризм мен кәсіпкерлік негіздеріне оқыту олардың осы процестің белсенді қатысушылары болуына мүмкіндік береді, бұл өз кезегінде қоғамдастықтың дамуына және өмір сүру сапасын жақсартуға ықпал етеді. Сонымен қатар, Зерендіні туристік бағыт ретінде ілгерілету белсенді ақпараттық қолдауды қажет етеді. Өңір туралы ақпаратты тарату үшін заманауи технологиялар мен платформаларды пайдалану, сондай-ақ туристер үшін білім беру бағдарламаларын әзірлеу Зерендіге қызығушылықты арттыруға және табиғатқа жауапкершілікпен қарауды қамтамасыз етеді. Осылайша, инфрақұрылымды жақсартуды, экологиялық білім беруді, жергілікті қауымдастықты қолдауды және аймақты белсенді ілгерілетуді қамтитын Зерендідегі туризмді дамытудың кешенді тәсілі тұрақты және табысты туризм индустриясын құруға мүмкіндік береді. Ұсынылған бастамалардың жүзеге асуы туристерді қызықтырып қана қоймай, Зеренді өңірінің бірегей табиғи және мәдени мұрасын болашақ ұрпаққа сақтауға зор үлес қосады.

Зеренді экологиялық аумағы – табиғи ресурстар мен экологиялық жүйелерді сақтау үшін маңызды орталық. Бұл аймақтың биологиялық әртүрлілігі, су ресурстары мен табиғи ландшафттары жергілікті экологияның тұрақтылығын қамтамасыз етеді. Алайда, климаттың өзгеруі мен антропогендік әсерлер, сонымен қатар, ауылшаруашылығының дамуы экологиялық тепе-теңдікті бұзуда.

Осыған байланысты, экологиялық мониторингі күшейту, тұрақты даму стратегияларын енгізу және халықты экологиялық біліммен қамту қажеттілігі туындайды. Зеренді экологиялық аумағының қорғалуы мен тиімді басқарылуы табиғаттың сақталуына, экожүйелердің тұрақтылығына және жергілікті қоғамның әл-ауқатына септігін тигізеді. Зерендіде экотуризмді дамыту үшін инфрақұрылымды жақсарту, экологиялық тұрақтылықты сақтау, жергілікті тұрғындарды қолдау, халықаралық нарыққа бағытталған маркетинг стратегияларын әзірлеу және туризмді жыл бойына тұрақты ету қажет. Бұл шаралар ауданның экотуризм әлеуетін толық пайдалануға мүмкіндік береді және жергілікті экономикаға оң әсер етеді.

INNOVATIONS IN THE HOSPITALITY INDUSTRY: CURRENT TRENDS AND TECHNOLOGIE

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The material of the article reveals the importance of innovative technologies in the hotel and restaurant services market at present. Hotel and catering enterprises are an integral part of the functioning of the economy in the modern world. This article reveals the importance of the hospitality and tourism industry in the development of a modern economy and business. Also, the importance of tourism as a socio-economic mechanism for managing organizational and technological indicators.

Keywords: *restaurant business, guest, hospitality industry enterprise, innovation, client, room, hotel, restaurant, service.*

The hospitality business plays an essential role in shaping the economy and business landscape. At present, the hospitality and tourism sectors are the most vulnerable in terms of competition. The number of tourists increases every year, creating a growing demand for guest accommodation with an appropriate level of service. As a result, hotels must compete for customers by offering superior services and a wide range of services. The rapid development of innovative technologies in the hospitality industry is driven by the need to meet these challenges. Specialists in the hotel industry are tasked with attracting more permanent clients while also ensuring profitability and loyalty. Achieving these goals without implementing innovative technologies is nearly impossible. The competition for every guest requires hotels and other accommodation providers to continually advance their technological capabilities. As B.Twiss stated, "Innovation is the activity resulting in the creation of an invention or idea that acquires economic value." F. Nixon defined innovation as: "An event that leads to the introduction of new or improved technological processes and equipment in the market."

In accordance with the ever-changing cycles of life, every hotel enterprise is forced to evolve and organize innovative processes. These stages should not proceed hastily but must be carried out sequentially within the framework of a developed enterprise strategy.

Examples of Innovation in the Hospitality Industry:

1. Information Technology: Computers have become an integral part of our lives, and we cannot imagine going a day without checking our email or browsing the internet. The importance of innovation in the hospitality and restaurant industries lies in the fact that modern computer technologies make service in hotels faster. For instance, at the reception, computers with software for quick check-in and guest registration are used, along with printers, faxes, and scanners. In hotel restaurants and bars, programs like R-keeper and Micros allow for easy order entry and billing.

2. Current Trends: One recent trend is attracting guests to restaurants through Teppanyaki shows, where chefs create dishes right before the guests' eyes. Although this is an engaging spectacle, it does not appeal to everyone. Technological progress has also brought Teppan-

innovations to the restaurant business: cameras are installed near the chef's workstation, and customers can watch the cooking process on a monitor at the table.

3. Interactive Menus: Interactive menus allow restaurant guests to place their orders directly. This is a convenient process that eliminates the need for guests to wait for a waiter. Customers can play games, read the news, or browse articles online while they wait for their orders.

4. QR Codes: The invention of the QR code, a two-dimensional barcode, has opened up new possibilities for online interaction between companies and consumers. Using smartphones, customers can scan the QR code to view the restaurant's history, the origin and authorship of unique interior details, as well as the menu items.

5. Interactive Bars: Another popular innovation is the interactive bar, an entertainment system embedded in the bar counter. It includes an interactive screen that displays video effects, the intensity and character of which depend on the objects on the counter and the behavior of the customers. The goal of this technology is to keep the customer entertained and engaged for as long as possible.

6. Restaurant Apps: Specialized restaurant apps require more investment (such as paying a programmer), but they can be downloaded onto customers' devices. Using these apps, guests can reserve tables, choose drinks, and learn about new menu items. In some cases, the apps can even be gamified.

7. Robots in Hotels: In some hotels in Japan, guests are greeted by electronic robots instead of live porters. While check-in is quick, this innovation is still in its development phase, as not everyone agrees that robots can replace human interaction.

Innovations in International Hotel Associations:

1. For example, Starwood Hotels and Resorts offers guests the chance to participate in the Starwood Preferred Guest (SPG) Program, where members earn points and receive additional services at hotels such as Westin, Sheraton, St. Regis, Luxury Collection, W Hotels, and Four Points in over 740 hotels across 80 countries.

2. To meet the needs of VIP clients, the Sheraton hotel chain has developed the "Hotels in Airports" program in nine European and four American airports. This includes services like "Cuisine According to Biological Clocks" developed by top chefs and nutritionists to mitigate the effects of air travel, and "Day Rooms" that can be booked for half the price but offer the same amenities as a full hotel stay. Additionally, guests receive a "Transit Survival Kit", which includes personal items and laundry services.

3. The Regent Berlin Hotel offers a special shopping experience where guests can buy men's and women's clothing from the Boss collection without leaving their rooms. This service is primarily aimed at business guests who may be invited to events, parties, or concerts and don't have appropriate attire.

4. The St. Regis chain offers its guests a new service: wireless communication with the staff. This ensures that guests receive detailed care and quick solutions to any issues. Personal butlers at St. Regis perform many different tasks, including meeting and escorting guests at airports, reserving tables at restaurants, and assisting with unpacking and packing.

5. The SoHo Loft Hotel in the United States uses a fingerprint system as a room lock. To ensure privacy, fingerprints are deleted after a few days.

6. At Peninsula Hotels, rooms are equipped with nail dryers, street temperature and humidity indicators, internet radio with 300 stations, and three levels of lighting. The phone in the room can be taken with you by switching it to a 3G network when leaving the hotel.

7. Many international hotels organize unusual exhibitions for their guests. For example, the Peninsula Hotels chain launched a mobile installation of works by Ivan Navarro and Janet Echelman.

Competitiveness in the Hospitality Industry:

This research reveals that there are two main approaches to improving competitiveness in the hospitality industry

1. Process Benchmarking: This involves searching for competitors whose successes are high and studying their experience for practical application.
2. Comparative Benchmarking: This involves comparing competitors and analyzing the details of their operations.

The main goal of implementing benchmarking technologies in the tourism business is to improve quality, which in the context of hotel services refers to the level of guest satisfaction.

Conclusion

In conclusion, innovations in the hospitality industry are essential for hotels to stay competitive, as the service sector is highly vulnerable to competition. Most guests are attracted to hotels with a broad range of services, and innovations are particularly important for business tourists who rely on computerization and information technologies. Additionally, hotels should not overlook the importance of advertising in attracting potential clients. A hotel must carefully organize PR activities, create a professional website, and produce quality promotional materials.

This article has examined the essence of hotel and restaurant innovations, defined key concepts, and provided examples of innovations in international hotel chains. It has also detailed the main methods for implementing innovations and attracting and retaining potential clients.

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Impact of corporate culture on organizational effectiveness: research methodology and empirical assessments

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ABSTRACT

In the context of globalization and rapidly changing market conditions, the effectiveness of organizations is becoming a key factor in their competitiveness. One of the important factors influencing organizational effectiveness is corporate culture. In modern research, the emphasis on corporate culture as a driver of success is increasingly confirmed, but requires a systematic and in-depth analysis. Companies that are able to develop a healthy and adaptive corporate culture have advantages in the field of innovation, employee motivation, and interaction with customers and partners. The purpose of this study is to study the relationship between corporate culture and organizational effectiveness based on empirical data. Both qualitative and quantitative methods were used to analyze the impact of corporate culture on organizational effectiveness. The novelty of the research lies in the integration of theoretical concepts of corporate culture with specific indicators of organizational effectiveness within the framework of one empirical study. In addition, the study offers a new approach to measuring corporate culture, including its impact on innovation, employee engagement and financial success of companies. Unlike traditional research, this study focuses on the dynamics of corporate culture and its ability to adapt to changes in the external environment. The results of the study showed that corporate culture has a significant impact on the key performance indicators of the organization. Companies with a strong, supportive and innovative culture show strong results in employee satisfaction, productivity and financial performance. At the same time, a culture focused on teamwork and development significantly increases the innovative potential and adaptability of the organization. The study also revealed that the flexibility of corporate culture and its ability to change in an unstable environment are important factors for long-term success.

KEYWORDS: corporate culture, organizational effectiveness, innovation, productivity, motivation

The question of how corporate culture affect an organization effectiveness has emerged as one of the main concerns in management and organizational study in recent decades. Globalization, digitization, quick changes in technology, and market demands are some of the issues that modern corporations must deal with. Under these circumstances, businesses that can adjust and efficiently than their internal operations have a competitive edge. The corporate culture of an organization is one of the most important elements that guarantee its successful operation. The values, beliefs, customs, traditions, and practices that bind employees together and share their conduct within the company are collectively referred to as corporate culture. It has an impact on every facet of corporate behavior, from strategic planning to employees' day-to-day tasks. In turn, the organization's culture has a significant impact on creating a work

environment that supports the productivity of both individual workers and the organization as a whole.

Scientists first became interested in corporate culture in the 1980s as they realized how important it was to the long-term viability and profitability of businesses. Edgar Schein's work, which distinguished three levels of corporate culture-basic assumptions, values, and artifacts-was among the first noteworthy investigations[1]. Edgar Schein's argues that corporate culture is shaped around deeply ingrained assumptions about the external and internal world of an organization and influences decisions that are made at all levels of management.

Among the primary hypotheses that link organizational success with corporate culture is the idea of "culture as a source of competitive advantage". Research shows that organizations with a strong and healthy culture focused on innovation, cooperation and respect are able to achieve higher financial results and high productivity. For example, Edgar Schein, the author of one of the most influential theories of corporate culture, continues to explore in this updated edition of his work how corporate culture and leadership affect the success of an organization. In particular, he emphasizes the importance of leadership in shaping, maintaining and changing organizational culture in a modern business environment [2]. In his opinion, leadership plays a crucial role in defining and maintaining a culture, which, in turn, significantly affects the effectiveness of the entire organization. Successful companies actively manage culture in order to maintain adaptability and the ability to innovate in the face of constant changes in the external environment. Measuring corporate culture has always been a difficult task for researchers and practitioners. Among the most popular techniques, the Deal-Kennedy model stands out. In their work, Deal and Kennedy suggested that the following six cultural components form the basis of corporate culture. The first is its history, including who founded it, why and on what ideals it is based. Values and beliefs come second. The ideas that employees perceive as an overall positive quality form the basis of corporate culture. Rituals make up the third part. These are typical incidents or daily tasks of employees. Then the stories follow. Corporate stories, which, as a rule, emphasize the ideals of the company and eloquently tell about the good deeds of employees in difficult circumstances. The heroes are the fifth in a row. These are the best employees because they are imitated and represent the ideals of the company. The cultural network is the latest. The essence lies in the search for information that is especially important for the work of the organization, carried out through the relationship between employees[3]. The challenges of quantifying corporate culture and its influence on organizational outcomes persist despite a substantial body of theoretical study. In particular, the topic frequently asks how precisely particular cultural component impact different facets of efficiency, like financial performance, innovative activity, and productivity. Many studies confirm the existence of a relationship, but the mechanisms of this relationship have not been fully disclosed. In addition, modern companies face the need to adapt their corporate culture in the face of constant changes in the external environment, which also requires additional research. With the development of technology and globalization, the organizational culture is becoming more flexible and innovation-oriented. Technological and digital changes require companies to adapt quickly, and it is the culture of the organization that can become the link that will help support this adaptation. With the development of technology and globalization, the organizational culture is becoming more flexible and innovation-oriented. Technological and digital changes require companies to adapt quickly, and it is the culture of the organization that can become the link that will help support this adaptation.

Given the diversity of approaches and theories, the impact of corporate culture on the effectiveness of an organization remains the subject of active debate among researchers. Today, there is a need for a deep empirical analysis that would assess the degree of influence of individual elements of culture on the effectiveness of organizations, as well as identify mechanisms that link

corporate culture with various performance indicators such as productivity, financial results and innovation ability.

Thus, this study will aim to empirically test the hypothesis that corporate culture has a significant impact on the effectiveness of organizations, as well as to identify specific factors that contribute to improving these indicators.

In the Materials and Methods part of the study, in order to study the impact of corporate culture on the effectiveness of an organization, it is important to clearly present what methods were used to collect and analyze data, as well as how these methods contributed to testing hypotheses and obtaining empirical results. The data were made focusing on the theoretical basis and modern approaches in the study of corporate culture.

Within the framework of this study, a case study was used - this is a method of qualitative research that includes an in-depth analysis of specific organizations or events. It allows you to explore how corporate culture affects the results of an organization in real conditions.

The next method is the analysis of secondary data, which consists in using already existing data collected earlier by other researchers or organizations. This method includes corporate reports, financial statements, internal culture studies, performance statistics, or employee satisfaction studies. The purpose of the study is to identify a correlation between the type of corporate culture and performance indicators, secondary data such as annual reports of organizations, performance and profit indicators will be used.

The latter method is a method of Observation, data collection, in which the researcher is directly involved in the life of the organization, observing the behavior of employees, their interaction, decision-making and the general atmosphere in the company. This can be either overt (when employees know they are being watched) or covert surveillance. In this method, you can observe how corporate culture manifests itself in the real actions of employees and interactions in the organization.

This section presents the results of a study aimed at studying the impact of corporate culture on the effectiveness of the organization. The data analysis was carried out using a case study, secondary data analysis and an observation method. Based on these methods, the relationship between different types of corporate culture and performance indicators in different organizations was investigated. The key conclusions and interpretation of the data obtained are presented, as well as the theoretical and practical aspects identified during the study are discussed.

The influence of the type of corporate culture on the effectiveness of the organization was the confirmation of the hypothesis that the type of corporate culture affects the effectiveness of the organization (Table1). Based on the analysis of key performance indicators, a table was compiled. This analysis clearly links elements of corporate culture with measurable results, which is convenient for a structured presentation.

Table 1. The impact of corporate culture on key performance indicators

Corporate Culture Element	Positive Impact on KPI	Negative Impact on KPI	Company Example
Innovation-Oriented Culture	Increase in productivity (up to 25%), rise in the number of new products.	High workload on employees due to constant changes.	Google - high level of innovation.
Hierarchical Structure	Faster decision-making at top levels.	Slower implementation of changes, reduced employee initiative.	Traditional structures in some banks.
Openness and Transparency	Increased employee engagement, reduced turnover (by 10-15%).	Potential conflicts due to lack of coordination between departments.	Microsoft - culture of feedback adoption.
Sustainability Values	Improved corporate image, enhanced client and employee loyalty.	Costs associated with implementing ecological and social programs.	Patagonia - leader in sustainable business.
Team-Oriented Culture	Improved project efficiency, enhanced quality of internal communication.	Possible delays in decisions due to the need for consensus.	Toyota - "kaizen" culture and teamwork.

It was compiled by the author based on the data [4-8]

This table highlights that elements of corporate culture have both positive and negative effects on efficiency, depending on the context and the level of their implementation. Organizations with an innovative or open culture demonstrate the highest rates of productivity growth and employee satisfaction. The choice of an element of corporate culture should be consistent with the overall strategy of the company to maximize the positive impact on KPIs.

This statement is emphasized by the following table, which demonstrates the measurable impact of elements of corporate culture on the effectiveness of the organization, confirming the statement that corporate culture significantly affects efficiency and success (Table 2).

Table 2: Statistical Data on the Impact of Corporate Culture on Organizational Efficiency

Corporate Culture Factor	Statistical Data	Impact on the Organization
Employee Engagement	Companies with high employee engagement are 21% more productive and 22% more profitable (Gallup).	Reduction in employee turnover by 25-50%, increased productivity and profitability.
Innovation-Oriented Culture	Companies with innovation-oriented culture grow revenue 30% faster (McKinsey).	78% of tech companies with innovative cultures launch new products 40% faster.
Transparency and Openness	In companies with transparent cultures, productivity increases by 15-20% (Harvard Business Review).	Reduction of miscommunication-related errors by 30%.
Sustainability Values	Unilever saw a 25% increase in customer loyalty and reduced costs by \$1.2 billion over 10 years.	Improved customer loyalty and reduced operational costs.
Team-Oriented Culture	Companies with team-oriented cultures increase productivity by 20% (Deloitte).	Faster project implementation (15-30%) and reduced costs by 10-15%.

It was compiled by the author based on the data [9-13]

Evidence that companies with high employee engagement demonstrate 21% higher productivity and 22% higher profitability is often mentioned in Gallup materials, especially in their annual employee engagement reports such as the State Global Performance Report.

McKinsey provides data on innovation as part of its analytical materials, such as "innovation through crisis" and other reports on corporate culture.

Harvard Business Review published an article on openness in corporate culture, tentatively, in working through the prism and external communication, the so-called "Cultural Factor".

Unilever focused experienced case studies on its annual corporate social responsibility report. As part of this study, research was conducted on the company's general website in the section "Sustainable Lifestyle Plan".

Deloitte is working together to analyze, so to speak, global trends in the field of human capital.

The table illustrates the key factors of corporate culture, their impact on the production and financial performance of companies, as well as possible business outcomes. Employee engagement is directly related to the growth of productivity and profitability of companies, as well as contributes to reducing staff turnover and improving financial results. An innovative culture accelerates the process of introducing new products and ensures faster revenue growth, especially in the technology sector. Transparency and openness increase productivity, minimize mistakes, and strengthen internal communications. The values of sustainable development lead to lower operating costs and increased customer loyalty, which strengthens the company's position in the market. Teamwork improves the efficiency of project implementation and reduces costs by supporting the well-coordinated work of employees.

The introduction and development of a corporate culture with an emphasis on engagement, innovation, sustainable development and teamwork has a significant positive impact on the productivity, financial stability and competitiveness of organizations.

Within the framework of the study, four main types of corporate culture were identified, which were studied within the framework of this study:

Hierarchical culture is focused on stability, hierarchy and clear processes.

The culture of entrepreneurship (the culture of adhocracy) is characterized by innovation, flexibility and high risks.

People—oriented culture (clan culture) - focused on employee support, teamwork and development.

The market culture is focused on results, competition and the achievement of external goals.

For each of these cultures, its contribution to the effectiveness of the organization was analyzed, including indicators such as profitability, productivity, employee satisfaction and innovation. The results showed that:

Market culture is positively correlated with high financial efficiency and competitiveness, especially in organizations focused on rapid adaptation and success in foreign markets.

Organizations with a pronounced market culture demonstrate high rates of profit growth and a stable position in the market.

A culture of control was associated with high stability and low staff turnover, but in some cases this culture limited flexibility and innovation, which affected the organization's ability to adapt to external changes.

An entrepreneurial culture promotes innovation and rapid response to change, but in an unstable external environment or insufficient risk management, such organizations may face financial problems.

A people-centered culture has proven its importance for long-term employee loyalty, creating a strong corporate atmosphere and a high degree of employee engagement. However, organizations with a pronounced "clan" culture may face increasing scale of problems and the need to make difficult decisions.

The observation method allowed us to gain a unique understanding of how corporate culture manifests itself in the daily lives of employees and in their interaction. During the observation, several important aspects were identified:

The interaction between employees in organizations with a pronounced people-oriented culture was characterized by a high degree of trust and cooperation. Employees actively shared information, helped each other solve problems and tried to create a favorable atmosphere in the team. For example, Google is known for its corporate culture focused on innovation and a high degree of employee freedom. The company encourages experimentation, creativity and risk-taking. Employees have the opportunity to work on projects of their choice, as well as participate in the development of new products and services. This contributes to a high level of innovation and rapid response to changes in the technological environment. However, such companies may face problems in the field of risk management and in the implementation of long-term stable strategies[14].

In organizations with a market culture, competition between employees was higher. Each of them was focused on personal achievements, while appreciating the result and striving for leading positions in the market. The interaction between employees was more focused on achieving individual goals than on teamwork. For example, Amazon, as a result-oriented company, actively develops a culture focused on efficiency, competitiveness and achievement. Amazon's success is determined by results such as profit growth, market share, and operational efficiency. Employees are motivated to achieve high goals, and the company has a widespread culture of

constant comparison and evaluation of performance. This culture contributes to the company's high growth rates, its market leadership and continuous improvement of business processes. However, this can also lead to high competition among employees and create pressure, which sometimes negatively affects the corporate atmosphere[15].

In organizations with a culture of control, a large number of procedures and formalities were recorded. Work processes were clearly regulated, employees adhered to standard practices and approaches, which provided a high degree of structure and order, but reduced flexibility in decision-making. For example, McDonald's is one of the largest fast food chains in the world, known for its strict organizational hierarchy and clear work standards. This company uses standardized processes and protocols in all areas of business, from cooking to customer service. Each task is strictly regulated, and employees follow clear instructions and standards[16].

Such a culture helps to maintain high quality and stability of work, reduces errors and increases efficiency, but can limit innovation and flexibility in rapidly changing markets.

The use of secondary data, such as annual reports, internal culture studies, performance indicators and financial reports, allowed us to confirm the theoretical conclusions drawn from the case study. For example, data analysis has shown that companies with a pronounced market culture, on average, show higher profits and growth rates. At the same time, companies with a culture of control showed lower growth rates, but were consistently profitable and showed fewer errors and losses.

Special attention was paid to comparing employee satisfaction data in companies with different cultural traditions. In organizations with a people-centered culture, employee satisfaction was higher, which directly influenced productivity and innovation. The results of the study emphasize the importance of corporate culture as a factor influencing the effectiveness of the organization. However, it should be noted that there are no universal solutions and types of corporate culture suitable for all organizations. The impact of corporate culture on work efficiency depends on many factors, including the industry, the external environment, the specifics of the work and even the stage of development of the organization.

For organizations with a pronounced entrepreneurial and market culture, it is important to ensure a balance between innovation and risk so as not to disrupt financial stability. In turn, companies with a culture of control and people orientation should pay more attention to adapting to changes in the external environment and ensuring flexibility in the decision-making process.

Thus, the results of the study confirm the hypothesis about the importance of corporate culture for achieving high results in an organization, but emphasize that it is necessary to take into account the context in which this culture functions.

The results of the study show that corporate culture has a significant impact on the effectiveness of organizations. Different types of cultures can have different effects on production and financial performance, as well as employee satisfaction. Given the diversity of organizations and their goals, it is important to carefully choose and develop the type of corporate culture that best suits the strategy and goals of a particular company.

Further research may be directed to a deeper study of the relationship between corporate culture and other factors such as leadership, technology, employee motivation and change management.

The study of the impact of corporate culture on the effectiveness of the organization confirms that corporate culture is an important and often decisive factor affecting the productivity, competitiveness and long-term sustainability of the company. Depending on the type of corporate culture, organizations can achieve various results: from a high degree of innovation and flexibility to stability and rigor in operational processes. Within the framework of the study, four main types of corporate culture were considered: a culture of control (hierarchical), a culture of entrepreneurship (adhocracy), a culture of people orientation (clan) and a market culture

(market). Each of these cultures has its own characteristics, advantages and limitations. The market culture, such as at Nike, is focused on results and high competitiveness, which contributes to strong growth and leadership in the market, but at the same time can create high pressure on employees.

A people-oriented culture, as in Patagonia, creates an atmosphere of trust and cooperation, which contributes to high employee satisfaction and customer loyalty, but in the context of rapid growth of the company, it may be difficult to maintain flexibility.

A culture of control, as in Coca-Cola, ensures stability and high operational efficiency, but limits flexibility and speed of adaptation in a rapidly changing market context.

An entrepreneurial culture, like at Google, promotes innovation and rapid response to change, but at the same time can create risks associated with instability. Organizations should consider the nature of their corporate culture and its alignment with strategic goals. For example, companies focused on stability and standardization should develop a culture of control, while those who strive for innovation and leadership should pay attention to elements of an entrepreneurial culture. In the context of globalization and rapid changes in the external environment, it is important that an organization can flexibly adapt its corporate culture. Companies operating in highly competitive industries must find a balance between stability and innovation, as well as take into account the needs of employees and changing external challenges. Thus, the impact of corporate culture on the effectiveness of an organization is not limited only to internal processes, but has a significant impact on the external success of the company, its ability to adapt to market changes and meet the needs of its employees and customers. The development and maintenance of an appropriate corporate culture is a key factor determining the success of a company in the long term.

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The digital economy's impact on business process management transformation

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Abstract

Companies must change their business procedures in light of the digital economy's explosive growth in order to stay competitive and adjust to the new market and technology realities. With the advent of digital technologies like automation, big data, and artificial intelligence, you can boost output, streamline processes, and enhance customer service. However, the hazards of cyberattacks, data leaks, and digital theft are also rising at the same time, necessitating the implementation of thorough cybersecurity measures and ongoing security system enhancement.

The study's findings will demonstrate that effective digital transformation necessitates not just the adoption of new technologies but also the establishment of an innovative and adaptable corporate culture. Additionally, it will be disclosed that businesses that employ integrated cybersecurity strategies are more resilient to emerging threats.

Companies should therefore focus on the strategic elements of cybersecurity and change management in addition to the technological side of transformation given the state of the digital economy today. In the midst of ongoing market changes, a thorough strategy based on the study helps firms reduce risks and boost their competitiveness and adaptability, giving them more stability and flexibility.

Key words: digital economy, transformation, business process, business management, risks.

In the context of the rapid development of the digital economy, business process management faces cardinal changes. Technologies such as big data, artificial intelligence, block chain and the Internet of Things create new opportunities and challenges for companies, changing the very nature of business activities. The use of digital technologies allows companies to optimize internal processes, increase operational efficiency and provide innovative products and services, which leads to increased competition at the global level. Digital transformation becomes not just a choice, but a necessity for the survival and growth of companies in the modern economy.

One of the key factors affecting the transformation of business processes is automation. Digital technologies allow you to automate routine tasks, freeing employees from mechanical work and giving them more time for creativity and strategic planning. Robotic processes, machine learning algorithms and automated data processing systems provide higher accuracy and speed of operations, minimizing human errors. As a result, companies can adapt faster to changes in the external environment and use their resources more efficiently[1].

Another important characteristic of the digital economy is the widespread use of data for management decision-making. Modern companies have a huge amount of data that can be analyzed to obtain valuable information about consumer behavior, market trends and internal efficiency. Data analysis and predictive analytics systems allow companies to make forecasts and

determine directions for business process optimization. This leads to an increase in the level of soundness of management decisions and a reduction in risks, which ultimately increases the competitiveness of the business.

The transformation of business processes in the digital economy also changes approaches to personnel management. The digital environment requires new skills and competencies from employees, which leads to a revision of traditional systems of training and staff development. Companies are forced to invest in advanced training programs so that employees can effectively use new technologies and adapt to the digital environment. This, in turn, requires management to adopt new strategies and approaches to the development of corporate culture aimed at supporting innovation and flexibility[2].

An equally important aspect of digital transformation is the change in interaction with customers. Digital platforms and communication channels open up new ways to interact with consumers, increasing the speed and quality of service. Companies using digital tools can offer more personalized products and services, meeting the growing needs of their customers. Thus, the digital economy allows companies to form stronger and longer-term relationships with consumers, which has a positive impact on customer loyalty and retention.

Finally, an important aspect of digital transformation is risk management and security. In the digital economy, companies face new threats, such as cyberattacks and data leakage. This requires the implementation of comprehensive cybersecurity and information protection measures, which in turn becomes an important part of business processes. Companies are obliged to invest in data protection technologies and build risk management systems to minimize negative consequences and maintain consumer confidence. Thus, digital transformation not only changes the management of business processes, but also requires a strategic revision of approaches to business security and sustainability[3].

Despite extensive research and developed methods for ensuring security in the digital economy, companies continue to face constantly evolving threats. Even with advanced technologies and security systems, new forms of cyberattacks and data leaks threaten the efficiency and stability of business processes. The main threats to companies in the digital economy include data leaks, which can occur both due to internal employee errors and as a result of intentional attacks by attackers. Data leaks can cause significant damage to the company's reputation and cause financial losses, as regulators in a number of countries impose fines for non-compliance with data protection requirements such as GDPR in Europe. In addition, compromising confidential information can lead to a loss of competitive advantage and a decrease in customer confidence.

Cyberattacks, including attacks using malware, ransomware and DDoS attacks, are aimed at undermining the work of companies, stealing data and extortion. Ransomware can block access to critical systems and data until the ransom is paid, which leads to temporary business downtime and significant financial losses. DDoS attacks, in turn, are aimed at overloading the company's servers, which disrupts the normal operation of online services and can lead to customer dissatisfaction and losses.

To counter such threats, companies implement comprehensive cybersecurity measures, including network protection, data encryption, access control, anomaly monitoring and incident response planning. Intrusion detection and prevention systems (IDS and IPS), firewalls, data encryption and multi-factor authentication are just some of the technical tools that provide a basic level of protection. These technologies allow you to prevent unauthorized access to information and track suspicious activities in real time, which makes it possible to respond quickly to potential threats[4].

However, technical measures are not sufficient for full protection: organizational and cultural aspects are also important. Companies train employees in cybersecurity rules and raise

their awareness of potential threats such as phishing and social engineering. Regular training and tests help reduce the likelihood that employees will become victims of attacks. The culture of cybersecurity, in which each employee is aware of his responsibility for information protection, is an important component of the company's resistance to threats. This approach allows companies not only to minimize risks, but also to stay one step ahead of cybercriminals, which is critically important in a dynamic and technologically advanced digital economy.

The modern digital economy has a profound impact on all aspects of business process management, which forces companies to adapt their strategies, introduce new technologies and revise approaches to organizational processes. The basis of this transformation is the use of innovative solutions such as big data, artificial intelligence, blockchain and the Internet of Things, which provide process optimization and help companies reach new heights in competitiveness and efficiency. In the context of a rapidly changing market, companies that actively implement digital tools receive significant benefits, including improved productivity, cost reduction and increased customer satisfaction.

Automation is the most important aspect of business process transformation in the digital economy. The introduction of robotic systems, machine learning algorithms and automated workflows can significantly reduce the time for routine tasks and reduce the likelihood of human errors. This is especially true for large corporations, where automation helps to process large amounts of information and perform complex operations with high speed and accuracy. In addition to reducing costs, automation helps to free up employees' time, which they can direct to more strategic tasks and innovative projects[5].

Data plays a central role in the digital transformation of business management. In the era of big data, companies collect, process and analyze huge amounts of information to support decision-making. The use of analytics and predictive modeling allows companies to more accurately predict changes in the market, better understand customer needs and respond quickly to external and internal challenges. Data analysis becomes an important competitive advantage, allowing organizations not only to optimize internal processes, but also to create personalized products and services, which increases their value to consumers[6].

The transition to the digital economy also transforms the approach to human resources management. Successful digital transformation requires a new set of competencies and skills, which forces companies to rethink their approach to employee training and development. Investing in advanced training programs and creating a corporate culture that supports innovation and adaptability are becoming key elements of a successful transition to digital management. Employees with knowledge of digital technologies and data analytics are becoming a valuable resource for the organization, contributing to its competitiveness and sustainability[7].

Digital technologies also change the nature of companies' interaction with customers. Tools such as mobile applications, chatbots and social networks allow companies to establish closer and more personalized relationships with consumers. Thanks to new communication and feedback channels, companies can better understand their customers' needs, respond faster to their needs and provide high-quality service. This strengthens consumer loyalty and strengthens brand reputation, which is especially important in global competition, when consumers have a wide range of alternatives.

Digital transformation of business processes also leads to changes in corporate strategies and approaches to long-term planning. In the context of rapid changes in technologies and market trends, companies are forced to abandon static development models and move to flexible and adaptive strategic approaches. This allows you to react faster to changes and introduce innovations. Long-term planning in such conditions requires constant monitoring and adjustment, which allows companies not only to be aware of changes, but also to form new directions of development and stay ahead of competitors[8].

The digital economy forces companies to adapt their business processes, introduce new technologies and revise their management approaches. Digital transformation is not just the introduction of new technologies, but also fundamental changes in the organization and culture of the company. Those companies that successfully integrate digital technologies into their business processes gain competitive advantages, become more flexible and resistant to change and secure leadership positions in the market.

Methods of studying the impact of the digital economy on the transformation of business process management can be divided into several key approaches aimed at an in-depth analysis of changes taking place in companies in the context of digitalization. These methods include the study of quantitative data, analysis of business cases, expert interviews, comparative analysis and modeling. Each methodology is important in its own way and helps to consider in detail certain aspects of digital transformation.

The first method is quantitative analysis, which allows you to measure the degree of impact of digital technologies on business processes through statistical data analysis. This method is based on the collection and analysis of a large amount of data, such as performance indicators, cost reduction, sales growth and customer satisfaction after the introduction of digital technologies. Analysis of this data allows you to get an objective picture of how digitalization affects the key performance indicators of the company and to identify patterns in changes[9].

Business case analysis is one of the main methods of studying specific examples of the introduction of digital technologies in companies. Within the framework of this method, successful and unsuccessful examples of digital transformation are studied, the conditions in which the transformation was carried out, the technologies used, as well as the results achieved are considered. Case analysis allows you to identify successful strategies and solutions, as well as to study mistakes that can lead to failure. This method is important for identifying best practices and creating recommendations for companies that are just starting the path of digital transformation[10].

Expert interviews play an important role in the study of digital transformation, as they allow you to get information from professionals who have experience in implementing digital technologies in various business areas. Experts working in areas such as process management, IT and data analytics can give an in-depth assessment of the changes caused by digital transformation and share insights on potential risks and benefits. This method allows you to enrich the study with unique information that is not available through other sources and provides a practical view of current trends and challenges[11].

Comparative analysis is also an important method for comparing companies that have gone through digital transformation with those that continue to use traditional business models. This analysis helps to identify differences in operational efficiency, management structure, financial performance and customer satisfaction. Comparison allows you to better understand what specific benefits and challenges digital transformation can bring, as well as to assess how significant the differences between digital and traditional approaches to management are.

Modeling is used to predict and evaluate the potential results of digital transformation. This method includes the creation of computer models that simulate the introduction of various digital technologies into business processes and assess their impact on the company's performance. Modeling helps the company to predict the impact of digital changes on various aspects of its activities, assess potential risks and opportunities, and determine the optimal ways to implement technologies. This allows you to minimize the risk when switching to a digital model and make more informed decisions based on modeling results.

The methodology also includes an analysis of the organizational culture and structure of the company, as these factors play a key role in the success of digital transformation. This approach explores changes in corporate culture, such as innovation, support for employee

training, and flexibility in management approaches. These aspects are analyzed on the basis of surveys and internal documents of the company, which allows you to determine how ready the organization is for digital changes and what cultural changes are necessary for a successful transformation.

Finally, an integrated approach combines different methodologies for comprehensive research. By combining quantitative and qualitative methods, case analysis, expert interviews and modeling, it is possible to create a complete picture of the impact of the digital economy on business processes. This method allows you to take into account all aspects of transformation and makes it possible to develop strategic recommendations for companies seeking to successfully adapt to the digital economy.

The results of the study of the impact of the digital economy on the transformation of business processes show significant changes in operational efficiency, management structure and approaches to interaction with customers. The use of quantitative methods of analysis has demonstrated that companies that have implemented digital technologies have achieved significant cost reductions, increased productivity and improved decision-making speed. For example, companies that actively use automation and data analytics have shown a reduction in operating costs by an average of 15-20%, which indicates the high efficiency of the implementation of digital tools.

Business case analysis has identified key success factors for digital transformation, such as clear planning, selection of appropriate technologies and management support. Successful examples of transformation have demonstrated the importance of a strategic approach to the introduction of technologies, including the gradual development of new tools and employee training. At the same time, unsuccessful cases have shown that the lack of support from management, insufficient training of employees and limited budget can lead to the failure of digital transformation. These findings underline the importance of a clear strategy and organizational training.

The results of expert interviews confirmed that the digital economy requires flexibility and constant adaptation from companies. Experts pointed out that successful transformation is impossible without a change in corporate culture, in which innovation and training are becoming priorities. According to experts, the key to success is to create conditions for flexible management and rapid response to changes in the market environment. These results emphasize the need to work on changes within the company along with the introduction of technologies, as organizational culture is becoming the most important factor for a successful transition.

A comparative analysis between digital and traditional companies confirmed that the former have higher adaptability and resistance to changes in the market. Digital companies were able to adapt faster to changes related to fluctuations in demand and new customer requirements. In particular, the data showed that digital companies achieve greater operational flexibility, allowing them to implement new solutions faster and meet customer needs. These differences emphasize that digital transformation can significantly increase the competitiveness and sustainability of the company.

Aspects	Digital economy	Threats	Cybersecurity
Operational efficiency	Growth by 15-20%	Vulnerability to cyber attacks	Adding protection systems
Management structure	Quick decision making	Data leaks	Safety rule
Interaction with customers	Improving customer service	Digital fraud	Multi-factor authentication
Corporate culture	Innovations and adaptations	Resistance to change	Cybersecurity culture

Table 1. An example of how it works.

Modeling of digital transformation scenarios showed the potential benefits and risks associated with the introduction of technologies in various business sectors. The results of the simulations showed that the integration of digital solutions can lead to an increase in revenue by 10-15%, but at the same time is accompanied by risks associated with data security and change management. These data emphasize that companies must take into account the balance between possible benefits and potential risks in order to choose the best strategies for the transition to a digital management model.

Analysis of changes in corporate culture showed that companies that successfully went through digital transformation paid attention not only to technological but also to cultural aspects. Companies that have introduced training and supporting innovation have shown better results in digital transformation. Internal readiness for change has proven to be critical, as it provides a smoother process of adaptation and support for digital initiatives. These results highlight the need to create an innovative and flexible corporate culture for successful digital transformation.

In general, the results of the study show that successful digital transformation requires an integrated approach that includes technology selection, strategic planning, corporate culture development and risk management. Discussion of the results allows us to conclude that the digital economy opens up new opportunities for companies to improve efficiency, but requires a careful approach to the implementation and management of changes. This approach allows you to minimize risks and ensure the stability of the company in the modern market, making it more competitive and adaptive.

The digital economy has a profound and large-scale impact on the transformation of business process management, creating both growth opportunities and new challenges for companies. The study showed that successful digital transformation requires an integrated approach, which includes the introduction of advanced technologies, process optimization, development of corporate culture and adaptation to market changes. The introduction of technologies such as automation, big data and artificial intelligence has allowed companies to increase productivity, reduce operating costs and improve customer interaction. At the same time, digitalization has required new skills, strategies and management approaches, which emphasizes the importance of staff training and a flexible approach to organizational change.

Analysis of business cases and expert interviews have shown that successful digital transformation depends on strategic planning and active support from management. Companies that have managed to integrate digital tools into their processes have gained a significant competitive advantage in the market, have become more stable and flexible in the face of

changing market requirements. On the other hand, the lack of support and insufficient organizational training may hinder the effective implementation of digital technologies, which indicates the importance of an integrated and phased approach to transformation.

Thus, digital transformation is not a one-time process, but requires constant adaptation and strategic management. The results of the study emphasize the need for flexible, data-driven management that supports innovation, which allows companies not only to optimize business processes, but also to create long-term value for customers and partners. In the digital economy, companies that have successfully passed through transformation gain a competitive advantage and stability, becoming leaders in their market.

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Assessing the financial results of mergers and acquisitions

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ABSTRACT

A key strategy for expanding a firm, bolstering market positions, and raising the company's worth is mergers and acquisitions (M&A). Creating synergy, or combining resources and assets to produce a larger overall effect than the sum of the individual outcomes, is the aim of the majority of transactions. One of the most challenging parts of this process is analyzing and evaluating potential financial outcomes, which is essential to the effective execution of M&A.

Businesses can determine how well the transaction's objectives—such as increased revenue, profitability, and market share—were met by analyzing the financial outcomes of mergers and acquisitions. In reality, it frequently happens that the actual outcomes deviate from the anticipated ones because of things like challenges with integration and cultural differences between businesses. When making decisions during the transaction's planning phase, evaluation techniques like cash flow analysis and multipliers are crucial.

However, M&A review should consider intangible factors like the impact on the company's culture and brand, in addition to financial metrics. Businesses that only concentrate on financial performance may have long-term issues including decreased employee enthusiasm and the departure of important experts. An integrated approach to evaluation allows you to more accurately determine the benefits and risks of the transaction and contributes to successful integration in the long term.

KEY WORDS: Merger, acquisition, financial analysis, comprehensive assessment, strategic goals

Mergers and acquisitions (M&A) are a key mechanism for business expansion, increasing competitiveness and creating long-term value for the company. This process can be initiated both by the company concerned and in response to market changes and rapid technological development. The main purpose of mergers and acquisitions is to create synergy - to increase the total value of the combined company by combining resources, assets and operational processes. However, the successful achievement of this goal depends on many factors, including strategic planning, thorough analysis and adequate assessment of financial results. Evaluation of M&A financial results is one of the most difficult aspects of this process. It includes the analysis of many indicators, such as changes in revenue, profitability, cash flow and the value of shares after the transaction is completed. Analysis of financial results helps to determine whether the transaction was profitable, as well as to understand whether it was possible to achieve the set goals for growth, improving operational efficiency and increasing market share. In practice, we often encounter situations when, despite the initially positive forecast, a merger or acquisition does not bring the desired result. This is due to a number of factors, including integration difficulties, cultural differences and a mismatch of strategic goals[1].

Many companies involved in M&A processes evaluate financial results both at the planning stage of the transaction and at the stage of its completion. At the initial stage, the assessment allows you to understand how much the potential transaction corresponds to the company's strategic objectives and how it will affect key financial indicators. Financial valuation includes methods such as analysis of discounted cash flows, multipliers, as well as asset valuation. Each of these methods provides unique information about the possible financial benefits and risks associated with a merger or acquisition. However, the M&A assessment has its limitations. First, it involves forecasting financial results in conditions of uncertainty, which can lead to errors in calculations. For example, the company's financial results after the transaction may depend on unforeseen changes in the economy, politics and market conditions[2]. In addition, cultural and managerial differences can affect employee productivity and, as a result, financial results. Experience shows that only a few companies achieve the full synergistic effect that was originally planned due to hidden integration barriers. In addition, assessing the success of mergers and acquisitions requires not only financial analysis, but also analysis of intangible factors such as brand, reputation and innovative potential of the company[3]. Many companies seeking M&A focus on financial performance, not taking into account important aspects that can have a lasting impact on corporate culture and employee motivation. As a result, even if the financial results show an increase in revenue and profits, the company may face an outflow of key employees, a decrease in productivity and a long-term loss of market positions. Thus, the assessment of the financial results of mergers and acquisitions is an important but complex process that requires a comprehensive approach. Companies must take into account not only traditional financial indicators, but also intangible aspects that may affect the long-term success of the transaction[4].

Mergers and acquisitions (M&A) remain one of the most significant strategic tools for the growth of companies, increasing their competitiveness and strengthening their positions in the market. The main purpose of such transactions is to achieve a synergistic effect, in which the combined company will bring more benefits and income than each of the companies separately. However, to ensure the success of M&A, a comprehensive assessment of the transaction results is necessary. For this purpose, various types of materials are used to help assess the extent to which the merger or acquisition corresponds to strategic goals and expectations, as well as to identify possible difficulties in the integration process. The main types of materials for assessing M&A results are financial statements, operational indicators and data on intangible assets. Each of these elements provides important information, complementing each other, and allows you to better understand whether the transaction was successful in the long term. Consideration of these materials helps not only to determine the financial and operational results of the transaction, but also to assess the impact on the brand, corporate culture and interaction with employees, which together determines the overall effectiveness of M&A.

Types of materials for assessing the financial results of mergers and acquisitions. Financial reports and analytical data. Financial statements play a key role in assessing the results of mergers and acquisitions, as they allow for a detailed analysis of changes in income, profits, profitability and cash flows of the merged company. Based on income and expense data, it is possible to determine whether the company's financial performance has improved after the transaction and to what extent this meets the initial expectations. In addition, the use of forecasts, such as discounted cash flow analysis (DCF), allows you to estimate the future value of the company and compare it with the expected benefits of the transaction. It is also important to take into account multipliers that help to understand how the transaction price relates to financial indicators, such as profit and company assets. Analytical data may also include information on the movement of the company's shares in the stock market. Changes in the price of shares before and after the announcement of a merger or acquisition often reflect investors' perception of the success of the transaction. The increase or decrease in the value of shares can serve as a signal how the market

evaluates the transaction, as well as identify possible risks that may be missed during internal analysis. Thus, financial reports and stock analytics provide a more complete understanding of the financial results of the transaction and its long-term prospects[5].

Operational indicators and performance data. Operational indicators are also an important component of M&A results assessment. They allow you to track changes in the productivity and efficiency of the combined company. Indicators such as production costs, time to complete operations and market share help to understand whether the declared synergy has been achieved. Operational efficiency becomes particularly significant if the purpose of a merger or acquisition is to improve logistics, optimize processes or expand production. For example, a decrease in unit costs after a merger may indicate an increase in operational efficiency. As part of the analysis of operational data, it is also important to take into account integration factors, such as process consistency and resource utilization. Successful integration leads to a reduction in duplicate functions and improved coordination between departments. However, in the case of insufficiently planned integration, operational indicators may deteriorate, which will lead to increased costs and reduced efficiency. Therefore, operational data serve as an indicator of how successful the integration after M&A was and whether the expected effect has been achieved[6].

Analysis of intangible assets and corporate culture. Analysis of intangible assets and corporate culture is an important part of a comprehensive M&A assessment, especially if companies with strong brands or unique technologies are involved in the transaction. Intangible assets such as brand, reputation, patents and know-how can have a significant impact on the success of the transaction, especially if the purpose of M&A is to strengthen market positions or strengthen the company's innovative potential. Valuation of such assets helps to understand how much they can contribute to increasing the income and competitiveness of the combined company. Corporate culture is also an important element of evaluation, as its mismatch can be a serious obstacle to successful integration. Differences in approaches to management, motivation and work environment can lead to conflicts, reduced productivity and outflow of talented employees. Often, companies that do not pay due attention to corporate culture issues face negative consequences despite the achievement of financial goals. Thus, the assessment of intangible assets and corporate culture allows the company to predict possible difficulties and develop strategies to overcome them[7].

An integrated approach to the analysis of materials. To obtain an objective and accurate picture of the financial results of mergers and acquisitions, companies should use an integrated approach that combines the analysis of financial, operational and intangible indicators. Financial reports provide quantitative information on income and expenses, operational indicators demonstrate the effectiveness of integration, and the analysis of intangible assets and corporate culture helps to understand the impact on long-term results and employee motivation. Only an integrated approach allows you to identify both direct financial benefits and potential risks associated with cultural and operational factors. This multifaceted approach also provides a better understanding of how different aspects of the transaction affect each other. For example, positive financial results can be leveled by operational difficulties if the integration of business processes is slow. On the contrary, successful integration and improvement of operational performance can compensate for minor financial shortcomings. As a result, the use of integrated material analysis allows the company to more accurately assess M&A results and build strategies for successful integration and long-term growth[8].

Methods for assessing the financial results of mergers and acquisitions.

Discounted cash flow analysis (DCF). Discounted cash flow analysis (DCF) is one of the main methods for assessing the value of a company in the merger and acquisition process. DCF allows you to determine how much a company will be worth in the future by discounting its projected cash flows, taking into account the time value of money and the level of risk. This

method is based on the assumption that the current value of the company is equal to the amount of future cash flows it will generate. The main advantage of the DCF method is its ability to take into account both the company's growth prospects and the possible risks associated with its activities and economic conditions. The DCF method also allows for a more detailed analysis of how a merger or acquisition will affect the financial results of the combined company. For example, companies can simulate how the structure of cash flows will change after integration and what factors may affect the profitability of the transaction. Despite its advantages, the DCF method requires significant resources to make correct forecasts, and its accuracy depends on the quality of the source data. In addition, this method is particularly sensitive to changes in the discount rate, which may have a significant impact on the final results of the assessment[9].

Multiplier method.

The multiplier method is one of the most popular approaches to evaluating companies in the M&A process, as it allows you to quickly determine the fair value of a company based on data on the value of similar companies. Multipliers are ratios that show the ratio of a company's price to its key financial indicators, such as profit, revenue or net assets. For example, M&A transactions often use the EV/EBITDA multiplier (the ratio of the company's value to its operating profit), as it allows you to compare companies taking into account their debt burden and operational efficiency. This method is popular because it is based on comparison with market prices, reflecting the current state of the industry and economic conditions. However, the multiplier method also has its limitations, as it does not take into account the unique features of the company that may affect its value, such as the quality of management, potential risks or unique intangible assets. The multiplier method works best in combination with other valuation methods, such as DCF, to provide a more accurate and comprehensive valuation of the company in M&A[10].

Assessment of intangible assets and analysis of corporate culture.

The assessment of intangible assets and corporate culture is becoming increasingly important when evaluating M&A transactions, as these factors can significantly affect the success of integration. This includes assets such as brand, patents, intellectual property, as well as corporate values and management approaches. The valuation of intangible assets may include methods such as the cost method (which estimates the cost of creating a similar asset), the yield method (which takes into account how much profit the intangible asset generates) or the market comparison method if there are similar assets. Corporate culture is also evaluated using various tools, such as employee surveys, organizational structure analysis and assessment of management approaches. This analysis helps to understand the extent to which the culture of the company with which the merger is carried out is compatible with the culture of the acquirer. In case of significant differences, companies may face integration difficulties, which will affect employee motivation and efficiency. Thus, the valuation of intangible assets and corporate culture is an important part of a comprehensive analysis that allows the company to more accurately predict the long-term results of the transaction[11].

An integrated approach to assessment.

An integrated approach that combines DCF, the method of multipliers and the valuation of intangible assets allows you to get a more complete picture of the value of the company and its prospects after M&A. The use of several methods helps the company not only to determine the fair price of the transaction, but also to take into account the possible risks that may arise in the integration process. This approach identifies non-obvious aspects, such as long-term financial benefits and risks, as well as integration and cultural barriers that may affect the effectiveness of the transaction. In addition, an integrated approach helps to avoid excessive focus on one of the aspects of the assessment. For example, using only the DCF method can lead to an undervaluation of intangible assets, which can significantly affect the success of the transaction. On the other hand, the multiplier method based on current market data may not take into account the future

potential of the company. The integrated use of all methods allows companies to get an objective assessment that reflects how both the current value of the company and its future growth prospects[12].

Method	Advantages	Restrictions
Discounted Cash Flow Analysis (DCF)	Takes into account the future growth potential of the company and its risks; provides in-depth analysis of forecasts.	Difficulty in making accurate forecasts; sensitivity to changes in the discount rate, which can significantly affect the final assessment.
Multiplier method	Easy and quick assessment; based on market data reflecting the current state of the industry and economy.	Does not take into account the unique characteristics of the company; depends on the market and may not take into account future potential and risks.
Valuation of intangible assets and corporate culture	Takes into account the impact of intangible assets and culture on long-term success; allows you to evaluate the intangible aspects of the transaction.	The subjectivity of the assessment, the complexity of the quantitative measurement of intangible assets and cultural factors, which may make it difficult to integrate the results into the overall analysis.
Integrated approach	Covers all aspects of the assessment, minimizes the risks of errors in one-sided analysis.	Time and resources, the need for a qualitative and accurate analysis of each method to avoid duplication or contradictions.

Table 1

There are also advantages and limitations of each method. Each of the evaluation methods has its own advantages and limitations. The DCF method, for example, allows for an in-depth analysis of future cash flows, but requires complex forecasts, which makes it vulnerable to errors when economic conditions change. The multiplier method, although it allows you to quickly estimate the value based on market data, does not take into account the unique aspects of the company and can lead to an incorrect assessment. The assessment of intangible assets and corporate culture, despite its importance, can be subjective and difficult for quantitative analysis. Therefore, companies often combine these methods to take into account all possible factors affecting the success of M&A as much as possible. As a result, the choice of a specific method or combination of methods depends on the purpose of the transaction, the characteristics of the industry and the risks associated with integration. This approach allows companies to more accurately assess both financial and non-financial results of the transaction, which in the long term contributes to the successful implementation of strategic goals.

Assessment of the financial results of mergers and acquisitions (M&A) using an integrated approach, including discounted cash flow analysis (DCF), multiplier method and analysis of intangible assets, provides a more objective picture of the success of the transaction. DCF provides an in-depth analysis of future cash flows, allowing you to take into account long-term prospects and estimate the economic value of the transaction. At the same time, the multiplier method offers a quick way to evaluate a company based on current market data, which is especially useful for comparison with the value of similar companies. However, the results of these methods can be very different if you do not take into account the unique features of the company and market conditions that affect the value of the transaction. Analysis of intangible assets and corporate culture provides valuable information about possible long-term risks and intangible aspects of the transaction, such as impact on the brand and employee involvement. For example, a mismatch of corporate cultures can create significant difficulties in integration, which will affect the productivity and motivation of employees. Although financial and operational results may seem successful, problems with cultural integration can reduce the expected effect of the transaction. Thus, ignoring intangible assets and cultural aspects can lead to a revaluation of the benefits of the transaction and create hidden risks. The use of an integrated approach combining financial, operational and intangible factors allows companies to more accurately assess the real benefits of M&A. A comprehensive assessment helps to identify not only current financial results, but also potential risks and benefits in the long term. This approach contributes to more balanced decision-making, as it allows you to assess both the visible results of the transaction and potential barriers to successful integration.

In conclusion, assessing the financial results of mergers and acquisitions (M&A) is a complex but critical process for achieving the strategic goals of companies. The use of an integrated approach, which includes analysis of discounted cash flows, multiplier methods and valuation of intangible assets, allows you to get a more complete picture of the financial and non-financial aspects of the transaction. Each of the methods contributes to the overall assessment, and their combination helps to identify both the potential for growth and possible risks that may affect the success of integration. In addition, attention to intangible assets and corporate culture is becoming increasingly important in modern markets, where the success of transactions depends not only on financial performance, but also on the ability of companies to adapt and integrate effectively. Problems with the integration of corporate cultures or undervaluation of intangible assets can have a negative impact on long-term results, despite positive financial results. Therefore, it is important to take into account all aspects of the transaction when evaluating it.

Ultimately, a thorough analysis and comprehensive assessment of M&A results serve not only to determine the success of the transaction, but also to form strategies that will help companies better adapt to new conditions, making the most of the opportunities provided by mergers and acquisitions. This approach allows not only to avoid potential mistakes, but also to create a basis for sustainable growth and competitiveness in the future.

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Principles for managing team in challenging situations

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ABSTRACT

Team management in challenging circumstances calls for adaptability, flexibility, and strategic thinking. Having a clear goal vision is one of the fundamentals. The team must understand that every action is intended to achieve a shared outcome, and the leader must communicate clear tasks and a long-term goal to the group.

In difficult situations, there is an even greater need for open communication and candid criticism. It is important for participants to feel free to express their thoughts and inquiries. By doing this, miscommunications are reduced and trust is preserved. The distribution of responsibilities is another crucial factor. Teams need to be able to work independently and solve problems fast in challenging circumstances. In turn, it is the leader's responsibility to establish an environment where each participant feels valued and supported.

Finally, stress resistance and the ability to control emotional reactions are necessary. The leader serves as an example, inspiring the team to remain calm and focused. This management structure allows you to adapt to changes and achieve results even in unstable conditions

KEY WORDS: team management, complex situations, various materials, various methods, modern methods, strategies.

High levels of flexibility, adaptability, and strategic thinking are necessary for team management in challenging circumstances. Maintaining a clear vision of goals and objectives is crucial in situations of ambiguity and pressure because it enables the team to comprehend the overall outcome they are aiming for. The introduction provides evidence of the value of learning crisis management concepts, which are critical for enhancing teamwork in contemporary environments where abrupt shifts and uncertainty are commonplace.

In challenging circumstances, open and honest communication is one of the most important rules. It is crucial that the team leader communicates goals and objectives in an understandable manner and maintains consistent communication with the group. Effective communication lowers the possibility of misunderstandings and keeps participants' general interest. Every person should be given the chance to voice their opinions and concerns, since this helps to foster an environment of openness and trust. Quick task adjustments are made possible by transparent communication, which also guarantees the team's flexibility in the face of changing circumstances [1].

Effective team management in difficult conditions also requires a careful distribution of roles and responsibilities. Delegation of tasks helps team members feel meaningful and important, and also allows them to respond more flexibly and quickly to changes. It is important that the leader creates conditions for the autonomy of participants, but at the same time remains available for consultation. In difficult situations, it is important to remember that the successful work of the

team depends on the contribution of each member, and if necessary, the leader must be ready to rebuild or redistribute tasks.

Another important principle is resistance to stress and control over emotions. The leader must set an example by his behavior, which helps the team stay calm and focused. Emotional stability and the ability to withstand pressure are critically important, as they allow you to cope with difficulties and maintain the morale of the participants. The leader is responsible for creating an emotionally supportive environment where each participant feels confident and ready for difficult work[2].

A variety of methods and materials were used to study these principles in more detail, including the analysis of literary sources on crisis management. The use of the methodology of qualitative and quantitative data analysis allows you to better understand which approaches are most effective and what changes occur in the dynamics of the team under the influence of external stressors.

Thus, team management in difficult conditions is an art that requires an integrated approach. Transparent communication, clear distribution of responsibility and emotional stability are key components. The use of various research methods helps not only to identify successful strategies, but also to adapt them to the specific conditions and needs of the teams.

Giving the staff the tools and assistance they need is another crucial idea. When faced with a challenging circumstance, the team's leader needs to pay close attention to their requirements and assist in overcoming obstacles that may occur from a lack of resources or knowledge. However, if the circumstance calls for unconventional solutions, it is crucial that the team leader not only supplies resources but also teaches people how to use them efficiently. In order for team members to feel secure and able to depend on management support, support also entails both professional and moral help. The capacity of the team's leader to encourage ongoing training and development. In crisis conditions, when high adaptability is required, it is important that each team member is ready for self-development and improvement of their skills. The leader, in turn, should encourage such initiatives and provide learning opportunities, whether training, feedback or joint discussion of solutions. Continuous development allows the team not only to adapt faster to changing conditions, but also to form sustainable skills that will be useful in future crises[3].

You can employ a range of resources that assist leaders and their teams in enhancing engagement, communication, and adaptation in order to manage the business during challenging times. These resources include advanced training programs, corporate simulations, online courses, specialized trainings, real-world scenarios, professional webinars, and platforms for analytics and monitoring. Each of these resources aids in the development of vital abilities and equips the group to react swiftly to changes.

Courses and trainings on crisis management and leadership. Leaders must possess particular abilities and expertise to manage a team during a crisis. With an emphasis on the development of adaptability, stress resistance, and emotional intelligence, a variety of training programs offer the chance to master stress management skills. Platforms such as Courses and LinkedIn Learning offer courses from leading universities and reputable companies that consider real management cases in difficult conditions. For example, the Crisis Leadership course, developed by Harvard University and available on the Harvard Online platform, teaches leaders the skills of effective crisis response and team recovery after difficult periods[4]. Course participants learn strategies that help not only to cope with current challenges, but also prepare them for future difficulties. These trainings and courses become an important tool for the development of the necessary competencies that allow leaders to confidently lead their teams through turbulent times and maintain high efficiency even in conditions of uncertainty.

Team activities and corporate simulations. In times of crisis, many businesses use team games and corporate simulations to find answers. By simulating several crisis scenarios, these

simulations show how the team responds to abrupt changes and outside pressure. This strategy aids in enhancing working methods, identifying process flaws, and fostering better teamwork. Teams can improve their ability to adapt and manage risks by participating in simulation trainings, as those provided by The Business Continuity Institute (BCI)[5]. These trainings give participants the chance to put important strategies into practice in a secure setting, which boosts their confidence and prepares them for real-world difficulties. In addition to developing skills, these activities foster a sense of teamwork, which is particularly crucial in high-stress circumstances [6].

Monitoring and analytics platforms. In a crisis, quick decision-making depends on the availability of up-to-date information about the state of the company and the external environment. Analytics platforms such as Tableau, Power BI and corporate ERP systems provide the ability to track key indicators in real time and conduct in-depth analytics. This allows managers to quickly adapt strategies and make informed decisions based on data. For example, Tableau offers powerful tools for data visualization and crisis monitoring, which helps managers respond quickly to changes in the situation and effectively manage resources. Access to up-to-date information helps not only in planning, but also in the implementation of necessary actions in conditions of uncertainty. These technologies are becoming important allies for leaders seeking to maintain the effectiveness and stability of their teams in difficult conditions[7].

Master courses and webinars are an effective way to quickly share information and experience, particularly during emergencies. These gatherings are frequently led by experts who have actually dealt with emergencies, enabling attendees to receive pertinent and useful guidance. Professional communities, associations, and top experts can host webinars, which offer a special chance to learn about novel strategies and management techniques in real time. For instance, improving crisis management abilities is the main goal of the Crisis Management Webinars series on the Crisis Response Journal platform. In addition to providing useful information, these webinars allow participants to ask questions of seasoned experts, which helps them comprehend issues and solutions on a deeper level [8].

An other crucial training technique for managers and their teams is the examination of actual crisis situations involving businesses that have experienced hardship. Analyzing both successful and unsuccessful tactics enables you to get important insights from the experiences of others. Case studies on crisis management, which show how various businesses have adjusted to changes and overcome challenges, are frequently posted on the Harvard Business Review website. These examples shed light on the ideas and methods that enabled them to endure and continue to function well in trying circumstances. Managers may develop better strategies and make wise decisions in uncertain situations by looking at instances like these [9].

Also, for successful management during difficult situations, various methods can be used to maintain stability, adaptability and efficiency. Three key methods developed by scientists are based on the analysis, adaptation and integration of knowledge into management. These methods allow managers to find the best solutions and increase the stability of their teams.

The first important method is the method of analysis of situations developed by a well-known researcher in the field of management, Garry Hamel. This method focuses on an in-depth analysis of the external and internal environment of the company, allowing to identify threats and opportunities during the crisis period. Hemel emphasizes the importance of SWOT analysis (strengths and weaknesses, opportunities and threats) as a tool to help managers understand what actions need to be taken to minimize risks. A deep understanding of the situation allows you to adapt strategies and make more informed decisions, which is critical in conditions of uncertainty[10].

The second approach is the situational leadership approach put out by Paul Hersey and Ken Blanchard, and it has gained widespread acceptance. This method highlights the value of flexibility in management by enabling leaders to modify their approach based on the team's

maturity and preparedness level. A more directive management style could be necessary in emergency situations where prompt action and decision-making are necessary. According to Hersey and Blanchard, a leader who can adapt his style to the situation can build a more resilient team that can handle challenges with a variety of approaches [11].

The third method that deserves attention is the change management model developed by John Kotter. Kotter identifies eight stages necessary for the successful implementation of changes in the organization, from creating a sense of urgency to consolidating changes in the corporate culture. In a crisis, change management becomes especially relevant, as it requires leaders to quickly and effectively implement new approaches and processes. Kotter emphasizes that it is important to involve employees at every stage of the change process in order to create support and avoid resistance. This allows not only to cope with current challenges, but also to form a more stable organizational culture capable of adapting in the future[12].

Methods of situation analysis, situational leadership and change management form a solid foundation for effective company management in a crisis. Their application allows managers to better understand the context in which they work, adapt their approaches to specific circumstances and provide support to their teams. Each of these methods focuses on active interaction with team members, which, in turn, contributes to building trust and increasing employee engagement. A critical aspect of the application of these methods is that they do not exist in a vacuum. Their successful implementation requires leaders to be able to correctly interpret data and analysis results. This includes the use of critical thinking to be aware of situations and emotional intelligence to support the team. In a crisis, it is this balance between analytical and emotional skills that becomes a key factor contributing to successful management and effective overcoming of difficulties.

Analysis of crisis management techniques revealed that the use of a variety of instructional and useful tools, including webinars, trainings, corporate simulations, analytical platforms, and real-world case analysis, greatly boosts leaders' and their teams' capacity to handle challenges. These tools offer exceptional chances for the quick development of critical skills in unpredictable times, boosting the organization's flexibility and stability.

You may immediately share experience through webinars and master courses led by leaders in the sector, and it is especially beneficial to have experts who have experienced crises participate. These kinds of gatherings give you access to pertinent information, let you ask experts questions and get advice, and help you develop your confidence and risk-management abilities. Webinars also provide constant updating of knowledge, supporting leaders in their desire to improve management methods.

Leadership trainings and courses focused on the development of emotional intelligence, flexibility and stress resistance also play an important role. Such programs allow leaders not only to better understand the principles of crisis management, but also to gain practical experience in the application of these principles. Courses available on educational platforms such as Coursera or Harvard Online help develop critical skills, including crisis analysis and rapid response strategies.

The use of corporate simulations and team games as a method of practical training allows you to simulate crisis scenarios, which allows teams to practice adaptation skills in a safe environment. Simulations help teams not only to hone the processes of interaction, but also to identify potential weaknesses that can have a significant impact on the company's work in real crisis conditions.

In addition, the use of monitoring and analytics platforms such as Tableau and Power BI provides the ability to respond quickly to changes. These platforms help managers analyze data in real time, which becomes critical for timely decision-making. Data visualization platforms allow you to quickly assess the current situation, identify key problems and adapt the company's strategy.

Its value as a teaching tool has also been demonstrated by the examination of real-world cases. Managers can choose tried-and-true crisis management techniques and steer clear of common blunders by analyzing successful and unsuccessful examples. Scientific publications, like those published in the Harvard Business Review, boost a company's prospects of surviving unpredictable times by providing a deeper understanding of which management choices and tactics worked and which didn't.

When combined, these techniques and resources offer a multifaceted strategy for crisis management of businesses, giving executives both academic understanding and real-world expertise. By combining analysis, flexibility, and real-world experience, you can build a team that can react swiftly to problems and reach well-informed conclusions.

Businesses require an integrated management strategy built on adaptability, sustainability, and decision-making speed during a crisis. Modern management techniques assist managers in creating a team that is capable of adapting and interacting in unpredictable situations, in addition to helping them devise a plan to overcome obstacles. Continuous skill development, knowledge, and consideration of other firms' experiences are crucial components of this process since they help you steer clear of typical blunders and depend on tried-and-true solutions.

Help resolve present issues while also establishing the groundwork for future expansion and sustainability.

In conclusion, effective management in challenging circumstances necessitates both a theoretical comprehension of the underlying ideas and a real-world application of the acquired information. The mix of training programs, case study, and teamwork enables organizations to not only handle actual difficulties but also prepare for future emergencies. These approaches place a strong emphasis on analysis, involvement, and support—all of which are essential for success and sustainability in unpredictable times.

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Managing competitiveness in a globalized world

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ABSTRACT

Competitiveness management becomes essential to businesses' success in the global marketplace in the setting of globalization. This article examines important tactics that assist businesses in striking a balance between local and global demands, such as the adaptation, aggregation, and arbitration (AAA) strategy. In addition to creating new opportunities and changing market conditions, digitalization and the platform economy also present businesses with ethical and data security challenges. Techniques like data analysis, technological investment, and a focus on sustainable development are crucial for guaranteeing long-term prosperity and helping businesses adjust to the quickly shifting global market conditions.

In the current environment, where global marketplaces are growing increasingly integrated, businesses must implement creative management techniques. In order to succeed in the global arena, one must strategically pool resources in order to attain economies of scale, in addition to being able to adjust to local conditions. Access to new markets is made easier by digitization and platform solutions, but businesses also demand that they adhere to strict guidelines for data protection and transparency.

KEYWORDS: Competitiveness, approaches, materials, methods, globalization, improvements, management.

Companies now face more competition than ever before in the context of globalization, which forces them to adjust to conditions that are always changing and find new strategies for retaining and growing their market share. International marketplaces are now more accessible, but they are also more competitive and uncertain as a result of globalization. Businesses that aspire to be leaders must constantly innovate, develop, and make their business processes more flexible. In this sense, managing competitiveness is especially crucial since it enables one to succeed in developing in the face of intense rivalry in addition to holding positions [1].

The capacity of the business to innovate is one of the essential components of competitiveness. Innovations serve as the foundation for the development of new goods and services that may draw clients and boost customer satisfaction in the face of ongoing technological advancement and shifting consumer preferences. In order to better understand the market and adapt to shifting demand, successful businesses make investments in R&D, create distinctive offers, and leverage cutting-edge technology like artificial intelligence and big data analysis. By using these strategies, businesses can stay one step ahead of their rivals and acquire and preserve competitive advantages. Global businesses also need to adjust to the cultural and economic variations seen in various foreign markets. Localization of products and services, as well as adaptation to the legislative and environmental requirements of each country contribute to the creation of deeper connections with consumers and brand strengthening. For example, companies that effectively adapt their marketing strategies and approaches to interaction with

customers significantly increase their attractiveness in the eyes of consumers and strengthen their position in the market[2].

Digitalization and automation of business processes also play a significant role in competitiveness management. The introduction of digital technologies allows companies to increase the efficiency of their work, improve the quality of customer service and reduce transaction costs. Moreover, digital solutions contribute to the creation of effective information management systems, allowing companies to respond quickly to changes in market conditions and make more informed strategic decisions. However, despite all the benefits of globalization, it also brings many risks. Companies face political and economic fluctuations, changes in consumer preferences and growing environmental requirements. Successful competitiveness management requires flexibility, adaptability and rapid response to external challenges. Companies that can combine innovation, localization, digitalization and sustainable development have the greatest chances of success and long-term sustainability in a globalized world[3].

The development of human capital is another crucial component of competitiveness management in the context of globalization. Businesses that make training and development investments for their staff members not only boost team morale and qualifications but also make them more competitive globally. Given the speed at which technology is developing and the increasing need for workers' talents, businesses gain from having a solid workforce that can solve challenging issues and adjust to changing conditions. Long-term growth of the business is positively impacted by investments made in personnel, which also help to create a creative and sustainable corporate culture.

Finally, sustainability and social responsibility are becoming increasingly significant factors of competitiveness at the global level. Modern consumers are increasingly preferring companies that care about the environment, respect human rights and support local communities. Companies that are able to integrate these values into their strategy gain a competitive advantage and consumer loyalty. Sustainable development is becoming an important component of competitiveness management, as it helps not only to reduce risks, but also to create a positive image of the company in the international arena. As a result, those companies that successfully combine innovation, adaptation, digitalization and sustainable development receive a solid basis for successful business in the context of globalization[4].

MATERIALS AND METHODS

Competitiveness will always require a balanced approach that prefers an effective combination of interests. A series of several models in the form of materials that are a successfully developed approach to level management in this globalized world.

The first of them: the AAA approach (adaptation, aggregation and arbitration).

Adaptation allows companies to adapt products and services to the specifics of local markets. This is especially true for culturally or economically diverse regions, where a single global strategy may not be enough.

Aggregation is aimed at reducing costs and optimizing production processes through unification and scaling. This strategy provides centralized management that increases efficiency through standardization and allows you to respond faster to changes in global trends. An example is IBM, which previously focused on adaptation and then moved on to aggregation, focusing on coordinating and scaling its processes for maximum efficiency.

Arbitration helps companies take advantage of differences between countries, such as economic or labor resources, as well as tax benefits, to minimize costs and optimize resource allocation. Control and finding a balance between these three approaches allows you to achieve high competitiveness, meeting both the requirements of local markets and global challenges. The ability to flexibly combine internal and external resources, choose the most appropriate

approaches to each market and adapt to its changes are the most important factors that help the company provide sustainable advantages in the international arena[5].

Next is the digitalization and growth of the platform economy. It radically changes the competitive environment for companies around the world. Platforms such as Amazon and Alibaba use network effects, which allows them to increase their market share and improve conditions for users. The economies of scale provided by these digital platforms help to significantly reduce costs and optimize logistics, which in turn provides small and medium-sized enterprises with access to resources and opportunities previously unavailable to them. This leads to the democratization of markets, where even small companies can compete on an equal footing with large players. However, with the increasing influence of digital platforms, there are new challenges related to data confidentiality and the need to regulate it. Platforms collect and analyze huge amounts of data, which raises questions about the security of personal information and how this data is used. It is important that companies operating in the digital space comply with ethical standards and protect their users' data while adapting their business models to new market conditions. Thus, for successful integration into the company's platform economy, it is necessary to take into account not only the advantages offered by digital technologies, but also the risks associated with them. Strategic data management and protection becomes an important part of a competitive strategy that contributes not only to increasing customer confidence, but also to sustainable business development in the context of globalization and digitalization[6].

Third, competitive theory. The theories of competitive and comparative advantages, as well as the concepts of the new economy, play a key role in the analysis of global competitiveness. In particular, Michael Porter's work on competitive advantages provides valuable tools to understand how nations and companies can strengthen their position in international markets. Porter highlights the importance of unique competencies and resources that allow companies to differentiate their offers and create added value for consumers. This requires not only a deep analysis of the company's internal environment, but also taking into account external factors affecting competitiveness. In addition, these theories emphasize the critical importance of investment in technology and innovation. In the context of rapid changes in the global market, companies must be ready to adapt and introduce innovations in order not only to maintain, but also to strengthen their competitive positions. For example, investments in research and development help enterprises develop new products and improve existing ones, which contributes to their success in the international arena. Thus, understanding and applying competitive theories is a prerequisite for the formation of effective competitiveness management strategies in a globalized world. Companies that are able to integrate these theories into their business processes will be able not only to survive, but also to succeed by effectively using their unique resources and competencies to achieve a sustainable competitive advantage[7].

Also, on the basis of the above materials, various methods can be used to achieve and maintain competitiveness in the context of globalization. A more detailed description of three methods of competitiveness management:

Innovative strategies. For example, they are a key method that allows companies to maintain and strengthen their competitive positions in the global market. The introduction of new technologies and the development of unique products make it possible to meet the changing needs of consumers and create additional competitive advantages. For example, research and development (R&D) companies can create revolutionary products or improve existing ones using advanced technologies such as artificial intelligence, machine learning and the Internet of Things (IoT). This not only increases the cost of the offer, but also allows firms to stand out from the competition. Success in innovation requires not only investment, but also the creation of a culture that promotes creativity and experimentation within the company. This approach allows teams to adapt faster to new trends and find non-standard solutions for complex tasks[8].

The second is sustainable development. Sustainable development is becoming an increasingly important aspect of strategic competitiveness management. Companies that actively integrate environmental and social factors into their business models not only meet the requirements of modern society, but can also gain significant competitive advantages. Effective sustainable development strategies may include the use of renewable energy sources, the introduction of environmentally friendly production processes and waste minimization. Such companies often attract a wider audience, including consumers who value social responsibility and brand ethics. In addition, sustainable development helps to reduce the risks associated with changes in legislation and public expectations, which in the long run can strengthen the company's reputation and increase its financial stability[9].

And the third, important data analysis. Data analysis has become an important tool for modern companies striving for competitiveness. With the help of big data technologies and analytical tools, companies can collect, process and analyze huge amounts of information, which makes it possible to make more informed decisions. Data analysis helps not only to understand consumer preferences, but also to predict future trends, optimize the supply chain, and improve marketing strategies. For example, companies can use customer behavior analysis to personalize offers, thereby increasing satisfaction and loyalty. In addition, the use of analytics can improve the efficiency of internal processes, allowing you to identify inefficient sites and develop strategies to improve them. Ultimately, this leads to a reduction in costs and an increase in the overall productivity of the company[10].

So what we understand after all this is that competitiveness in a globalized world requires special approaches. Why? So that companies keep themselves afloat among all, deeply understanding the dynamics of international markets and applying a variety of strategies. This article considers the key aspects that help companies adapt to change, ensuring their sustainable development and success in the international arena. Let's start with the AAA approach (adaptation, aggregation and arbitration), which becomes fundamental for companies seeking to create a balance between global and local strategies. Platforms such as Amazon and Alibaba have not only changed the rules of the game, but also democratized access to resources for small and medium-sized enterprises. The role of competitive theories, such as Michael Porter's theories, should also not be underestimated. They provide important tools for analyzing competitive advantages and emphasize the importance of investing in technology and innovation.

Those are the three key methods of competitiveness management: innovative strategies, data analysis and sustainable development. Innovations allow companies to adapt to rapidly changing conditions and stand out among competitors. Data analysis provides the necessary tools for making informed decisions, and sustainable development strengthens reputation and attracts customers who care about the social and environmental aspects of business.

Successful competitiveness management in the context of globalization requires an integrated approach that includes both strategic and operational elements. Companies that are able to integrate these aspects into their business processes will be better prepared for the challenges of the modern market and will be able to ensure sustainable growth and development.

In general, as we understand from everything, competitiveness in a globalized world is a complex task that requires companies to be flexible and able to adapt to constantly changing market conditions. The importance of strategies such as adaptation, aggregation and arbitration cannot be overestimated, as they allow companies to effectively interact with different regions and cultural contexts, optimizing their resources to achieve the best results. Digitalization and development of the platform economy add new dimensions to strategic management, giving companies the opportunity to expand their markets and improve customer interaction. However, these opportunities also pose serious challenges related to data security and the need to comply with ethical standards. Competitive theories, in particular the work of Michael Porter, remain

relevant in the context of globalization, emphasizing the importance of unique competencies and technologies to maintain competitiveness. The introduction of innovative strategies, data analysis and emphasis on sustainable development are becoming necessary components for successful functioning in the international arena. Therefore, companies seeking successful competitiveness management should integrate these strategies and methods into their business processes. This will allow them not only to adapt to current challenges, but also to ensure sustainable growth in the long term, thereby strengthening their positions in the world market.

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ADVANTAGES OF STARTING AND EXECUTING START-UP PROJECTS IN THE MODERN ECONOMY

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ABSTRACT

The article examines the development of strategic initiatives to support technological startups. As innovative companies, startups aim not only to introduce new products and services to customers, increase capital, and generate investor income, boost employment in the post-industrial network economy, and enhance the country's global image, especially in the IT sector.

In crafting these strategic initiatives, the authors extensively relied on Professor V.L. Kvint's strategy methodology. Emerging trends in investment models, where more corporations shift from product sales to solution implementation, allow for investment optimization by outsourcing internal processes. This creates additional opportunities for startups, especially small innovative companies.

Significant development potential is linked to the substantial domestic market and rapid growth in information technology, coupled with organizational support from companies and universities for startups. This is crucial since startups, unlike stable businesses, do not have consistent sales or generate sufficient cash flow but rely on funding from investors and founders.

The authors justify the application of the "Canvas" business model for technological startups, enabling flexible adjustments not only in business processes to find optimal consumer solutions but also in corporate strategy development. The sustainable financing model for small innovative companies significantly differs from standard financial models. The authors highlight the need for business accelerators, which can be created by large corporations, universities, development institutes, and private funds.

Moreover, startup funding sources are not limited to venture capital but can include new instruments like mutual funds for qualified investors. The article presents strategic initiatives that Kaspersky iHub can practically use to support IT sector startups and optimize business incubator operations.

KEYWORDS: startups, innovation development strategy, business accelerators, development institutes

The development of an innovative economy requires not only large-scale investment projects from major businesses and state corporations but also initiatives from small companies and startups. These startups aim to introduce innovative products to the market. Currently, this sector is receiving attention not only from state corporations of development institutes.

What sets startups apart from small businesses? Like small businesses, startups are private enterprises aimed at creating value, typically in the medium term, through the launch of innovative products. However, startups must have unique characteristics, focusing on offering innovative products or services. Through technological or organizational innovations, startups can also offer existing products (or services) in more accessible ways, beyond just pricing but through

new consumption models.

Traditional businesses target specific market segments within a geographic area, with owners having a clear understanding of potential and expected profitability. In contrast, startup founders think on a larger scale, aiming to conquer new markets, often beyond domestic ones, driven by a vision to change the world.

Small business entrepreneurs seek profitability in the short term, focusing on immediate profits rather than growth rates and business value. Startup founders, on the other hand, recognize that their projects may not generate income or be self-sustaining in the initial years but anticipate rapid market share growth, revenues, and business value over time. Some startups linger too long in this stage, and business accelerators can help decide when to free up resources for new projects.

In creating startups, founders often contemplate exit strategies, which may involve selling the business to large corporations or institutional investors, selling shares, or going public (IPO). Small business entrepreneurs typically rely on personal funds, family and friends, bank loans, and sometimes government support. Assets can be used as collateral, with specific business plans minimizing risks and shortening payback periods.

For startups, the initial financing is similar to small businesses, but with longer market entry times and no finished products. All risks, including strategic ones, are higher. However, strong venture investors can help mitigate these risks by providing funding, business advice, and market connections, as seen in Silicon Valley.

Timing is crucial for startups. It's more important to make a product appealing to customers and bring it to market quickly rather than perfecting it. Excessive product development can waste time and resources, so a minimally viable product (MVP) is key. Venture investors, often called business angels, typically join projects when there is a tangible idea, an MVP, or a prototype with initial orders.

The distinction between startups and small businesses also lies in the flexible delegation within startups, where employees switch roles easily and are often motivated to work for minimal pay with high engagement, possibly with equity stakes. Unlike small businesses where salaries and roles are fixed, startups, during scaling, need to attract additional staff and pay them competitively.

Leadership and teamwork are critical in startups, demanding non-standard hours and maximum resource dedication. This cohesion and shared goal orientation are essential for the team's success.

Startups significantly contribute to diversifying Russia's economy, boosting employment in the post-industrial network economy, and shaping the country's global image.

To develop recommendations, we used V.L. Kvint's strategy methodology [1, 2], enabling the creation of strategic initiatives based on existing competitive advantages and resource bases, aligning with the interests of stakeholders and medium-term trends. Additionally, the authors drew on the works and theories of M. Porter on competitive advantage [3], J. Schumpeter on innovation development [4], R. Grant's strategic frameworks [5], M. Castells' post-industrial information society [6], rapid technological and societal changes by E. Toffler [7], and the flexibility in strategic decisions by K. Ohmae [8].

The following trends highlight the high efficacy of startups in the modern economy. Firstly, digital transformation and network-based interaction models are more adaptable than traditional vertically integrated companies. This business model transformation emphasizes post-capitalism [9], giving startups a significant edge in innovative sectors linked to the digital economy. Even in traditional sectors associated with material production, opportunities arise for startups due to the extensive diversification and individual consumer preferences facilitated by the post-industrial

digital economy. Small companies specializing in narrow market segments may hold competitive advantages over large businesses.

The second trend is the rise of the ESG approach. Mass production imposes additional environmental burdens, whereas startups often aim for more efficient solutions, advancing ESG strategies, and adapting more flexibly to the needs of customers and other stakeholders. A portion of society in various countries rejects consumption norms dictated by consumerism. Despite the USA's leading role in setting consumption maximization norms, alternative economic and consumption models (China, India, emerging markets) are gaining influence [10]. Consequently, more people seek balanced models, choosing products from both large international corporations and local producers. This trend creates additional opportunities for startups to introduce their products to local markets.

While maximizing individual consumption may not entirely disappear, new economic models favor shared resources, relevant for both households and businesses, which increasingly outsource functions. Consumption models are also changing, with some automakers offering subscription-based car usage. Businesses often prefer renting equipment over significant investments. Thus, the rise of the sharing economy enhances opportunities for small innovative companies.

Growing risks and uncertainties in the modern economy also create new opportunities for startups. Startups are not only created from scratch in new fields but often collaborate with large businesses on specific projects. For instance, a major pharmaceutical company might entrust the development of a new drug to a startup, reducing reputational, financial, and other risks while flexibly utilizing human and financial resources. If a product fails to meet expectations, the project can be closed more straightforwardly than within a large corporation with established bureaucratic processes. Moreover, closing startups is unlikely to impact the parent company's capitalization. Thus, spinning off startups from large companies lowers risks and enhances the confidentiality of innovative activities, as startups do not need to disclose information unlike public companies.

Additional trends influencing the development of startups include improving engineering education and IT specialist quality, leaders and youth focusing on creating their own businesses outside large corporations, increased innovation rates, and the proliferation of state programs promoting innovation in both developed and developing countries.

IT startups typically evolve based on the following technological trends:

Algorithmic Data and Data Analysis: Each year, large corporations increasingly rely on algorithms and data analytics, gradually freeing employees from control functions. Over time, not only operational processes within companies and their interactions with the external environment but also strategic decisions, including at the board level, will rely on algorithms, data analytics, and artificial intelligence.

Artificial Intelligence (AI): AI adapts to new circumstances and promptly adjusts behavior models, considering various scenarios.

Digital Personalization: This trend aims to create a virtual twin of an individual, replicating their behavioral and consumer patterns using AI.

The Spread of Digital Currencies and Cryptocurrencies: This significantly impacts the IT industry.

Cloud Solutions: Already widely used in business and daily life, cloud technology holds great potential. Some studies suggest that over 70% of large enterprises are ready to move their servers to the cloud, although this is currently challenging to implement.

The next step in the strategy methodology is conducting an OTSW analysis to identify competitive advantages for developing startups in Russia. OTSW analysis includes opportunities, threats, strengths, and weaknesses. Opportunities:

Substantial internal market and rapid IT growth;

Readiness of large Russian companies to invest in new areas (e.g., companies like MTS, Kaspersky, Sber have established various business accelerators);

Growing demand for domestic IT developments;

Support for digital initiatives under the national "Digital Economy" program, aiming to transform key economic sectors through digital technologies;

Country advantages, such as affordable electricity and favorable environmental and climatic conditions for building facilities (e.g., data centers).

The Skolkovo Innovation Center actively supports startups, creating the Sk Ventures digital platform and, together with VTB Capital, a financial fund for late-stage startup support. The post-industrial network economy model provides advantages for startups to enter both domestic and international markets.

One of the most active players in Russia's corporate acceleration market is Sberbank with its Sberbank 500 program. Involving the international accelerator "500 Startups," this program captures almost 50% of the internal market, with 2400 startups from 75 countries participating and 19 companies becoming "unicorns." The program focuses on IT technologies.

Sectoral segmentation of accelerators reveals IT, financial services, and telecommunications as leaders. The location of corporate accelerators depends on the need for interaction with the technical and research units of corporations, and the number of accelerators worldwide reflects their importance in different countries. Types of accelerators and incubators in various countries include:

Private: Techstars (USA), Y Combinator (USA), 500 Startups (USA);

Corporate: Google Launchpad Accelerator (USA), Startup Path (Europe);

State: Start-Up Chile (Chile), Beta-i (Portugal), NUMA (France);

University: StartX (USA), MIT delta v (USA), UTEC Peru (Peru).

Threats:

Few venture capitalists in Russia with less experience than Silicon Valley investors;

Underdeveloped startup infrastructure;

Low diversification due to the structure of the Russian economy, with many startups specializing in IT, AI, data analytics, and banking technologies, while other fields (e.g., pharmaceuticals) are underrepresented;

Funding difficulties not only at the initial stage but also at later stages, as retail investors face market restrictions;

Existing regulations for banks and collective investment sectors, along with strict risk management requirements, limit startup investment opportunities;

Limited readiness of the Russian military complex to use products from innovative companies and startups, unlike in the USA, where many startups focus on the military industry, requiring breakthrough technologies. Strengths:

Highly educated workforce, including engineering and IT specializations;

High level of business training;

Willingness of the younger generation to take risks and start innovative businesses;

Government recognition of the importance of this sector, leading to the creation of various funds aimed at supporting startups in recent years. Weaknesses:

Limited number of universities able to support startups with narrow specializations;

Virtually no initial stage funding for startups (a problem not unique to Russia);

High uncertainty prevents startups from building long-term strategies, requiring them to quickly become sustainable businesses or cease operations;

The strategy for a startup as a new business fundamentally differs from that of an established company, whether it's a multinational corporation (MNC) or a small traditional

business. It's not just about the differences in strategic management, but also in the founders' goals. At the initial stage, a startup operates with minimal business activity, aiming to create and market a new product (or service) with the expectation of high profits and rapid business growth. Typically, the following key stages of a startup are identified:

Startup Creation and Product Prototyping: Developing founders' ideas and using their funds to seek venture investors ready to co-finance the business to complete product development and advance to the next stage.

Product Finalization and Market Introduction: Completing a full-fledged product, attempting market entry (which may require several iterations), scaling production, establishing stable partnerships, developing sales and logistics channels, achieving regular and increasing sales, and growing customer loyalty. During this period, the company needs investments to expand its team, and the product becomes more refined and complex.

Final Development Stage: Ensuring regular sales and, ideally, reaching the break-even point. Practical steps for exit strategy implementation include finding new investors, selling the business to a larger company, or going public (IPO). Simultaneously, startup founders decide on their future involvement, either fully exiting the business or remaining in strategic roles while relinquishing operational control.

The main difference between a startup's strategy and a stable business is that startups rarely achieve stable sales or generate sufficient cash flow initially, relying instead on investor and founder funds. Therefore, it's crucial for startups to achieve a minimum sales level that covers costs (break-even point) and then rapidly increase sales volumes. Startups may not have a clear strategy or business plan early on, as it's vital to experiment with product features, pricing, and target consumers, and adjust delivery and marketing channels.

While venture investors often require a formal business plan, the Canvas business model is seen as a more effective tool for early strategy development. The Canvas model is flexible, focusing on understanding the startup's clients, the product's target, and specific customer needs. It also outlines revenue and expense streams. Often, a startup with global goals cannot achieve its objectives solely with existing resources. Therefore, identifying large companies or government funds as key partners is crucial. Experience shows that startups often find it challenging to reach end consumers (B2C model) and may more easily transition to a B2B model. In such cases, the number of clients is limited, and they can be viewed as both clients and partners.

Based on the above analysis, the following strategic initiatives can be proposed: To stimulate the growth of startups, it's crucial to create a supportive institutional environment. Universities and technical institutes can serve as accelerators, providing platforms for young scientists and graduates who aspire to be entrepreneurs and innovators. Universities have a competitive advantage with young people ready for change and an abundance of talent, although the level of business competence and understanding is still developing. Universities should offer not only space at minimal costs but also provide advisory support to help startups build connections with large businesses and potential venture investors. Leading universities and business schools in the USA already have accelerators performing these functions.

However, many innovations come from individuals with business experience who see imperfections in existing products and want to create something new. For these visionaries, university settings may not be ideal. Instead, accelerators established by large companies (both state-owned and private, Russian and foreign) or specialized funds are more suitable. These startups benefit from a more practical focus and likely faster growth and maturation.

Some risks in developing startups through universities or companies include potential biases favoring startups that align with the institutions' specializations. Non-specialized startups may not receive the same high-level consulting services. Given the structure of the Russian economy, priority sectors such as space and nuclear industries, and IT, are likely to see the most

growth, while fields like pharmaceuticals may lag behind. Creating accelerators in state specialized funds could be a solution.

Startup financing varies greatly depending on the stage, and challenges in finding funding are global. High risks and expectations of high returns make it difficult. Silicon Valley and Israel's experiences show that startup hubs require:

- Funding from business angels and venture investors at both early and later stages.

- Experienced business angels ready to mentor startups.

- A concentration of large businesses, including state and military corporations interested in acquiring startups.

- Universities with both technological and business profiles and funds to support startups.

- Accelerators organized by a wide range of stakeholders (universities, corporations, state funds).

- An entrepreneurial spirit and initiative, particularly among younger generations.

- A supportive legal and institutional environment that simplifies bankruptcy procedures, allowing founders to start new ventures.

While all these factors are necessary, they may still be insufficient for the optimal development of innovative startups. Financial resources are particularly critical, as most graduates lack sufficient funds to start businesses. Universities need to provide not only funds for young innovators but also conditions for graduates to actively interact with each other and major companies.

Yale University's endowment fund, established in the early 19th century, is a legendary example. Since the mid-1980s, a significant portion of its investments has been in startups, yielding returns exceeding investments in the S&P 500. Russian universities today have limited capacity to provide similar funding. Venture investments are also challenging for industrial companies and banks due to regulations requiring reserves for potential losses.

Retail investors are likewise restricted in investing in startups without qualified investor status. While protecting retail investors from high risks is justified, laws and regulations shouldn't create insurmountable barriers for new types of investments. Financial regulators worldwide, including the Bank of Russia, strive to balance investor protection with risk acceptance. Regulatory sandboxes allow for experimenting with alternative regulatory approaches.

A compromise could be creating interval or closed-end mutual funds to pool retail investor funds for venture investing while imposing additional restrictions, such as industry-specific investments. It's essential to set requirements for management companies to assemble a pool of investors and select investment projects.

Until recently, strict requirements for bond placement, including the issuer's existence period, limited funding opportunities. Regulatory experiments could allow IT startups to use both equity and debt financing. Development institutes' roles in such investments could expand [11]. Such funds can combine various financial instruments – preferred shares, convertible bonds, corporate bonds, etc. Investors in late-stage startups should have no voting rights initially, preserving this right for startup creators for a certain period (e.g., 2-5 years). After this period, the mutual fund could convert investments into shares, remain as debt, or be a mix of financial instruments. Management companies issuing mutual fund shares could have different funds, some for active management and others purely for financing.

The implementation of startup strategies is exemplified by the Kaspersky iHub, which involves several stages.

Stage One: Independent Development In this initial phase, the nascent startup is ready to develop its idea and has already formed a (typically small) team for its realization. Although the innovative technology might not be fully developed, there is a strategy in place for product formation and market entry.

Stage Two: Engagement with the Business Accelerator Here, the startup independently submits an application to a business accelerator and undergoes an evaluation process known as the funnel. This includes validation processes such as technology testing, product adaptation to Kaspersky Lab's policy, and conducting pitch sessions. Startups that pass these stages move on to piloting, which involves creating a fully functioning product and field testing it. If all procedures are successful, a contract is signed between the startup and the accelerator, wherein the accelerator acquires a stake in the company in exchange for investment.

Stage Three: Scaling Up This phase involves developing a strategy and starting the product launch in the market. Sales are carried out through Kaspersky Lab's channels. At this stage, product refinement, team expansion, marketing strategy development, and brand formation occur.

Stage Four: Reaching Break-Even At this stage, the startup achieves its first profits, evolves into a full-fledged company, establishes its brand in the market, and develops its sales channels. If everything goes according to plan, the internal company evaluation begins, and an investment plan for future external investors is developed.

Stage Five: Seeking Investors The company becomes fully independent of Kaspersky Lab's sales channels. The investment plan involves attracting additional investments, increasing sales volumes, and growing the company's market value. The company actively seeks investors.

Stage Six: Involvement of Funds and Management Companies Here, a part of the startup's shares, including those held by the accelerator, is sold to a fund tentatively named Kaspersky Lab Invest. This fund is essentially a diversified portfolio including similar Kaspersky Lab products at different stages. Since the fund includes startups at later development stages with typically stable sales, the risks are lower than at earlier stages. Controlled risks allow for relatively inexpensive financing from institutional investors. Moreover, funds can be diversified by risk levels, and those with lower risk could consider selling shares to retail investors and commercial banks.

Final Stage: IPO Preparation At this point, the company is managed by professional management (not the startup founders), is recognized in the market, has a clear strategy, and consistently implements it. Stable profits allow for significant business growth, making the company ready to initiate the IPO process.

This model not only helps develop the startup using the accelerator's capabilities at specific stages but also allows founders to exit the business and transfer management to professionals while investors earn profits. Using an accelerator and fund gradually redistributes ownership, sharing risks at each stage among new owners. The highest risks and returns are typically for investors who enter the startup at early stages.

A startup's key competitive advantage becomes its partnership with a large IT corporation with the necessary competencies in developing and promoting digital products and corporate resources such as programmers, designers, marketers, and an established distribution network. This partnership can significantly accelerate the startup's development and market entry.

An example of this business model is the Kaspersky Innovation Hub, which provides effective financial support for IT startups. It is also important for foreign investors to participate in this business model. They will be interested in entering the Russian venture financing market if the necessary infrastructure is created and investment protection guarantees are provided [12].

The strategy development for corporations and small innovative companies (startups) is based on different principles, as startups are just beginning to build their client base and seek a business model to generate steady cash flow and profit. The active use of information technologies in the modern economy and existing competitive advantages in this sector within our country create strategic opportunities for the growth of IT startups. These initiatives are already being implemented by several Russian companies.

Innovative companies can leverage flexible, so-called agile strategies, applying the Canvas model, establishing partnerships with large IT companies with established markets, while business

accelerators serve as an effective approach for fostering long-term partnerships and supporting innovative development.

Funding opportunities for startups have traditionally relied on venture investments, but it is also prudent to consider using collective investment instruments. A business model is proposed that optimizes the involvement of IT companies in the capital of startups depending on the startup's development stage.

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METHODOLOGY, TECHNOLOGY AND THE PROCESS OF THE ORGANISATION'S STRATEGY IMPLEMENTATION

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ABSTRACT In a rapidly changing external and internal environment, the implementation of an organization's strategy requires a clear methodology, modern technologies and a well-coordinated management process. This study is devoted to the analysis of methodological approaches used in the process of implementing the strategy, with an emphasis on modern tools and digital technologies, as well as identifying factors contributing to and hindering the successful implementation of strategic plans. The growing uncertainty and the speed of changes in the economy make it urgent to develop and implement strategies that can adapt to external changes. The research methodology includes a qualitative analysis of existing theoretical approaches to strategy implementation and a comparative analysis of the best practices of companies that have successfully implemented digital technologies in their strategies. The work used methods of data analysis and synthesis, as well as thematic analysis of interviews with managers of organizations implementing strategies in the context of digital transformation. As part of the empirical part of the study, a study of the experience of companies in various industries was conducted to identify common success and failure factors.

The results of the study showed that the key factors for the successful implementation of the strategy are: the presence of a clearly formulated methodology, support from management, adaptability and flexibility in the implementation process, as well as the use of digital technologies. The most effective methodological approaches and technologies have been identified that facilitate the adaptation of strategic processes to conditions of uncertainty.

KEYWORDS: strategy, implementation, methodology, technology, digital transformation, organizational processes

The implementation of the strategy is considered the main stage of strategic management, as it determines how effectively and timely an organization is able to achieve its goals in conditions of uncertainty and rapid change of economic conditions. There are a large number of approaches to the strategic implementation process based on various methodologies and technologies. As Bolisani E. and Bratianu C. point out, many traditional methodologies, such as the classical process approach, include strictly structured stages of strategy planning and execution[1].

However, in recent decades, the growing dynamics of the external environment requires more flexible approaches, which leads to the active use of adaptive strategies that allow organizations to quickly respond to changes in conditions of high uncertainty.

As part of the study, the collected sources on strategic management indicate a significant impact of digital technologies on the process of implementing strategies. In the context of digital transformation, organizations integrate technology into the strategic process, which significantly increases efficiency and adaptability. Thus, the study of the authors' data showed that digital tools

such as data analytics and automation help accelerate decision-making and provide better conditions for the implementation of the strategy[2]. Moreover, the work of the following authors highlights that the introduction of agile methodologies such as Agile and Lean has become especially relevant for organizations working in rapidly changing industries such as IT and finance[3]. However, the successful implementation of the strategy requires not only technology, but also a well-structured process supported by organizational culture, employee engagement and resources available to complete the tasks.

The research of the following authors emphasizes that the strategic map and performance indicators are important elements contributing to the coherence of actions within the organization and coordination at the execution level[4].

Among modern approaches, considerable attention is also paid to the change management process, which helps to minimize staff resistance when implementing new strategies. Fernandez's, and Rainey's work points to the importance of supporting leaders and building proper communication, which contributes to the successful implementation of change[5].

Thus, the introduction of modern methodology and digital technologies into the strategic process allows organizations to increase flexibility and sustainability, as well as improve coordination of efforts to achieve strategic goals. The purpose of this study is to analyze the methodology, technologies and processes that contribute to the effective implementation of strategies in organizations. The study is supposed to identify factors and tools that can increase the flexibility of strategic processes and adapt them to modern market requirements.

Thus, the relevance of this study is due to the need to develop effective approaches to implementing the strategy in conditions of high uncertainty and digital transformation. The analysis of various methodologies and technologies adapted to modern realities will allow organizations not only to increase their competitiveness, but also to respond quickly to external changes, effectively managing resources and involving employees in the process of achieving strategic goals.

To achieve this goal, the following methods were used during the research.

A thematic review of the literature and research data on strategic management methodologies has been conducted, including the work of authors such as Chirwa M. [6], Ludviga I. [7] and Tawse A [8]. With the help of analysis and synthesis of the theoretical base, a basis was created for classifying approaches to strategy implementation, which made it possible to identify traditional and modern strategic management technologies. This method shows that traditional approaches remain effective, however, in conditions of rapid market adaptation and digital transformation, they require the integration of flexible methodologies and digital technologies to maintain competitiveness.

The analysis of cases of companies that implement modern methods and technologies in strategic management is carried out. Companies from various industries (financial sector, IT manufacturing) have been selected, which have implemented flexible methods and digital solutions to adapt to the changing environment. It has been found that companies using digital technologies, such as big data analytics, automation and collaboration platforms, demonstrate higher adaptability to external changes.

Using data for forecasting helps companies quickly adjust strategic goals and reduce response time to market changes. Within the framework of this study, it should be noted the results of a qualitative analysis of the strategies of successful organizations that have implemented modern methods and technologies in strategic management, adapting to changes in their environment (Table 1).

Table 1. The case of successful companies

Company	Industry	Implemented methods and technologies	Implementation results
Amazon	Retail, technologies	Using Big Data, Consumer data analytics, Agile methods for development	Improving forecast accuracy, personalizing customer experience, improving supply chain efficiency.
Microsoft	Information technology	Transition to cloud technologies (Azure), DevOps and Agile	Successful transition from software sales to the SaaS model, revenue growth and improved adaptability to market changes.
Toyota	Production	Lean-methodology and automation of production processes	Reduction of production time, minimization of losses, improvement of product quality, improvement of reputation.
Netflix	Entertainment	Analytics and Machine Learning for recommendations	Personalized recommendations, improved user experience, increased subscriber base.

Source compiled by the author based on the data [9-12]

These companies demonstrate the use of flexible methodologies and digital technologies to achieve high efficiency and adaptability in a rapidly changing environment.

Amazon, through the use of data analytics and personalization of services, not only improved the supply chain, but also achieved a unique level of customer focus, which led to customer loyalty and increased market share. Microsoft, thanks to the transition to Azure cloud services and flexible development methods, was able to transform its business model and take a leading position in the cloud segment. By implementing Lean methodology and automation, Toyota has not only reduced production costs, but also improved product quality, consolidating its reputation as a reliable manufacturer. Netflix has implemented data analytics and machine learning to personalize recommendations, which has helped significantly improve the user experience and increase subscriber retention. This approach has made Netflix one of the leading players in the industry, with an ever-growing audience and a unique reputation in the field of personalized content.

The study of methods and technologies of strategy implementation in leading companies demonstrates that the use of flexible methodologies and digital tools is becoming necessary in conditions of growing uncertainty. The examples of Amazon, Microsoft, Netflix and other successful organizations show that modern approaches such as Big Data, machine learning, cloud technologies and Lean methodology can not only improve operational efficiency, but also adapt the strategy in real time. Integrating these technologies into the strategic process promotes

flexibility, which is important to maintain competitive advantages in an environment of rapid change.

An important aspect of successful strategy implementation is the ability of companies to coordinate changes at all levels of the organization, including management, personnel and resources. Management support and the correct building of organizational culture play a crucial role in ensuring coherence of actions and perception of strategic changes. For example, Microsoft, going through the transformation to the SaaS model, paid attention not only to the introduction of cloud technologies, but also to retraining, building a new corporate culture aimed at flexibility and innovation.

In addition, the use of personalized technologies, as in the case of Netflix, helps companies not only better meet customer needs, but also increase their loyalty, which is especially important in a saturated market. However, the introduction of digital technologies involves a number of challenges, including the need for constant updating of the technical base and training of personnel to work with new tools. Companies such as Toyota have successfully adapted Lean methods to the production environment, focusing on continuous improvement and automation, which has minimized costs and improved quality.

Thus, the successful implementation of the strategy requires an integrated approach combining modern methodology, digital technologies and adaptive processes. Organizations that actively implement these elements become more resilient and better prepared for market changes, which allows them not only to remain competitive, but also to identify trends in their industries.

However, the introduction of such technologies and methodologies is not without challenges. The need for constant investments in technical infrastructure, staff training and adaptation of internal processes requires significant resources and active support from management. In addition, change management is a critical factor, as the introduction of new methodologies is often accompanied by resistance from employees, which can hinder the successful implementation of the strategy.

In general, the successful implementation of the strategy requires not only a clear methodology, but also the flexibility of processes that allow the organization to adapt to changes. The study highlights the importance of an integrated approach to strategy implementation, which includes employee engagement, management support and effective use of modern technologies. This is the only way companies can achieve sustainable competitive advantages in a dynamic market environment and successfully implement their strategy.

This study confirms the importance of integrating flexible and digital technologies into strategic processes, which contributes to a more effective implementation of the strategy in the face of dynamic changes. The data obtained can be useful for creating practical recommendations aimed at adapting strategies in various industries and organizations, as well as for forming strategies that increase the competitiveness of companies.

The implementation of the strategy is a fundamental stage of strategic management, on the successful implementation of which the achievement of the goals set by the organization in a changing external environment depends. Modern conditions require organizations to implement flexible approaches and digital technologies, which allows them to quickly adapt to high rates of change and uncertainty. The study showed that the integration of digital tools such as data analysis and automation accelerates the decision-making process, and Agile and Lean methodologies contribute to more effective coordination and employee engagement at all levels.

Successful implementation of the strategy requires not only technological solutions, but also a well-structured process based on a strategic map and performance indicators that ensure consistency and direction of actions within the organization. Successful implementation of

changes requires proactive management of staff resistance, support from leaders and a developed organizational culture, which minimizes risks when switching to new working methods.

Thus, the combined use of modern methodologies, digital technologies and strategic management allows organizations not only to increase flexibility and sustainability, but also to strengthen their competitive positions in the market, effectively adapting to new challenges.

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Strategic planning methodology and alternative management decisions in management

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ABSTRACT

The study investigates the relationship between human capital levels and innovative development across various nations during the shift to the sixth technological paradigm. The authors hypothesized that the sensitivity and impact of innovations on human capital would significantly differ among various country groups.

To verify this hypothesis, the authors utilized analytical, statistical, and correlation-regression methods. This multifaceted approach enabled the identification of varying degrees of correlation between human capital levels and GDP, human capital and innovation, and the comprehensive effect of innovation.

The research findings are applicable in forming proposals and measures for regulating innovation processes, with a focus on prioritizing national interests in the scientific, technological, and economic development sectors. Additionally, the study highlights current economic trends and their impact on the formation of human capital, detailing the contemporary requirements of an innovative economy.

KEYWORDS: human capital, innovative economy, science and education, information and knowledge, investments in human capital.

INTRODUCTION

Research and analysis of current economic trends in leading Western nations reveal that an innovative economy relies on knowledge, innovation, and the positive reception of new ideas, technologies, and systems, ready for practical application in various human activities. This type of economy emphasizes knowledge, especially scientific knowledge.

In such an economy, traditional sectors of material production are transformed and their technological foundations are radically altered through scientific and technological progress. Production that does not integrate new knowledge and innovations becomes unsustainable.

In an innovative economy, knowledge fosters a continuous stream of innovations that respond to and often shape rapidly changing needs. Humans are the creators of these innovations, thus significantly enhancing the role of human capital. Human capital is a strategic asset for a country's competitiveness in an innovative economy, characterized by its ability to engage in innovative processes, adapt to changes in internal and external environments, and assess globalization impacts.

Information technologies, computerized systems, and advanced production technologies form the foundation of an innovative economy. Their development transforms all methods of acquiring, processing, transmitting, and producing information, technologically enhancing intellectual activities like automated design and production preparation, production control, financial and accounting reporting, organizational management, multilingual automated

translation, diagnostics, and pattern recognition.

Industrial revolutions, subsequent modernization, and the integration of innovative technologies in production have driven the need for new specialists, promoting the acquisition of new knowledge, skills, and competencies. As we transition to a new technological era, significant transformations in the education system and labor market are expected, shaping a new cycle of human capital knowledge accumulation over the next 10-20 years.

The education system is crucial in forming human capital to meet labor market and economic demands. However, it may lag in fulfilling these needs due to time delays, as educating and "supplying" required specialists to the labor market takes 4-6 years. This creates a significant gap between actual and needed human capital reserves, especially during economic shocks or crises, signaling the need for educational system reforms to align with labor market demands.

In these circumstances, stakeholders actively work to bridge this gap or optimize existing human capital reserves. To address this issue, the authors examined the relationships between human capital levels and economic, scientific, and technological development, identifying which country groups are best positioned to transition to the new technological era.

The study aims to: Determine the degree of correlation between key indicators of scientific and technological development: human capital → innovation → GDP for various country groups worldwide.

MATERIALS AND METHODS

The concept of "human capital" in economics is relatively recent, even though William Petty first identified the connection between labor skills and national wealth creation in the 17th century [1]. The modern theory of human capital began to take shape in the 1960s, with Nobel laureates T. Schultz and G. Becker laying the groundwork. They each approached human capital from different perspectives.

T. Schultz defined human capital as an additional income source derived from an individual's knowledge, skills, and abilities [2]. His focus was on its profitability, viewing human capital as the extra income generated from an individual's intellectual, creative, or physical abilities [3]. On the other hand, G. Becker considered human capital in terms of "costs," emphasizing the investment in education, healthcare, and migration, which collectively form and accumulate human capital over a lifetime. Becker argued that in addition to individual capabilities, a strong institutional framework is essential for unlocking an individual's potential, advocating for investments in education, healthcare, and the attraction of skilled migrants to build national wealth [4].

At the same time, the institutional perspective on human capital gained prominence. This view emphasizes the economic returns of human capital within the context of social institutions and their influence on human capital levels. Researchers in this field demonstrated that social institutions play a crucial role in shaping human capital, affecting both its quantity and quality [5]. They argued that social interactions enhance the quality of human capital, strengthen intergenerational connections, and facilitate the ongoing transfer of professional skills, thereby boosting human capital accumulation and its economic value.

In Russia, significant contributions to human capital research came from scholars such as R.I. Kapelyushnikov, A.L. Lukyanova, A.I. Dobrynin [6], and R.N. Nureyev [7]. Unlike their Western counterparts, Russian researchers emphasize intangible elements in the formation of human capital, such as culture, motivation, public welfare, and social institutions.

The increasing significance of human capital in the global economy has prompted international organizations to focus on measuring and evaluating its impact. Bodies like the UN, OECD, and the World Bank have developed various definitions and assessments of human capital. The World Bank, for example, defines human capital as the knowledge, skills, and health

accumulated by individuals throughout their lives, enabling them to reach their potential as productive members of society. The UN and OECD offer similar definitions.

Thus, the concept of human capital encompasses both common elements and distinct nuances in its interpretation. It is a multidimensional indicator that includes abilities, knowledge, skills, experience, motivation, as well as social and cultural factors.

The recognition of human capital's complexity emerged toward the end of the 20th century, leading to the development of initial methods of assessment. In the 1970s, J. Kendrick proposed the cost method, which calculated human capital accumulation based on its total "replacement cost," including individual and governmental spending on education, healthcare, and labor migration [8].

The U.S. National Science Foundation, in collaboration with OECD experts, developed a system of indicators for scientific and technological progress that reflects human capital's qualitative aspects. This system enables the evaluation of intangible capital, which is essential for economic growth.

Experts from the UN have also contributed to this field, defining human capital as the knowledge, skills, abilities, and other attributes embedded in individuals, which significantly influence social and economic well-being. Their methodology includes comprehensive assessments and specific indicators such as life expectancy, active employment duration, labor force participation, and family life cycle.

The World Bank introduced a discounted method for valuing human capital, which assesses both its economic and qualitative characteristics. This approach not only estimates the value of human capital but also evaluates its combined effects on national wealth. The greater the concentration of skilled professionals in the economy, the larger their collective contribution to long-term human capital accumulation.

Today, human capital is recognized as a complex and intensive factor crucial for the innovation and economic development of any country. Studies from various nations consistently demonstrate that the returns from human capital far exceed those from physical capital.

The development of human capital plays a central role in the strategic planning process within management. Strategic planning involves setting long-term goals and determining the necessary actions and resources to achieve them. In terms of human capital, this planning focuses on enhancing education, healthcare, and social institutions to nurture a skilled and knowledgeable workforce.

Alternative management decisions are key to this process. These decisions include investing in innovative educational technologies, improving healthcare systems, and implementing migration policies that attract skilled professionals. Additionally, promoting a culture of continuous learning and adaptability within organizations can lead to sustainable economic growth. By implementing strategic planning and making informed management decisions, countries can effectively develop their human capital and ensure long-term prosperity.

RESULTS AND DISCUSSION

An analysis of the distribution of the countries under study by quadrants showed that 157 territories were allocated across three quadrants: the first, third, and fourth. The first quadrant consisted of 45 territories (29% of the sample), the third quadrant had the largest share with 61 countries (39%), while the second quadrant contained just 4 countries (0.25%), and the fourth quadrant included 12 countries (8%). These territories can be tentatively categorized as developed, developing, underdeveloped, and those in transition.

This classification is provisional, as some countries categorized as developed are not universally recognized as such by international organizations, such as Eastern European countries that are still considered developing. For instance, Panama, once viewed as underdeveloped, has

now transitioned into the developing category.

Over the past decade, favorable external conditions have enabled oil-producing countries to significantly enhance both the quality of life and human capital accumulation by adopting advanced technologies, which require new skills and training. This has helped nations like Kuwait and Saudi Arabia approach developed status.

A correlation-regression analysis revealed a significant nonlinear relationship between GDP per capita and the human capital index in the countries studied. The effect of human capital on GDP varies across different country categories. While the relationship is similar for both developed and developing countries, it is notably stronger for underdeveloped countries, suggesting that even modest increases in income can have a substantial impact on human capital levels.

In 2017-2018, most underdeveloped countries were situated in the third quadrant, reflecting low human capital levels and limited technological advancement. This gap is expected to widen between underdeveloped and developing countries as they transition to the sixth technological paradigm.

The global pandemic at the end of 2019 slowed the global economy's transition to this new technological era, as indicated by data from the World Bank. During this period, human capital levels declined for most developed and developing countries, with exceptions like Singapore, the UK, and France, which managed to maintain their levels. Some low-income countries, such as India, experienced improvements, which can be attributed to changes in education formats and healthcare challenges.

Human capital plays a vital role in determining a country's potential during the shift to a new technological era and its subsequent development. Cross-country comparisons suggest that Russia is better positioned for long-term economic growth than China and other BRICS countries, largely due to its higher human capital levels.

The decline in human capital in developed countries and its improvement in developing countries led to a convergence of these nations in 2019-2020, allowing some to move between quadrants. For example, China and Ukraine advanced to the first quadrant, while Romania and Botswana shifted to the second.

The correlation between human capital and GDP is somewhat weaker in developed countries, likely due to their more complex economies, where innovation and other factors also play significant roles in economic growth.

Despite China's technological advancements, its economy remains deeply integrated into the global system, utilizing nearly all its available production capacities. Thus, during the shift to the sixth technological paradigm, China may face a reduction in its production capacity, as older capacities may no longer be compatible with the new technological environment.

In contrast, Russia, where many production capacities have been underused for years, has the opportunity to rejuvenate and upgrade these capacities using digital technologies. A similar trend is evident in Kazakhstan, which despite declines in human capital and GDP per capita in 2020, still maintains high levels in these areas.

Research indicates a nonlinear relationship between human capital and GDP, highlighting the complexity of the global economic system, which is further complicated by the introduction of innovations. The study also shows a strong correlation between innovations and human capital levels in most countries. While this correlation is direct and linear, its intensity varies across different groups of countries, with a more pronounced effect in 2019-2020.

For example, in underdeveloped countries, the effect of human capital on innovation is weaker, with a flatter slope in the correlation compared to other countries. This suggests that innovations in underdeveloped countries, without corresponding improvements in human capital, will have a limited positive impact, unlike in developing countries with stronger human capital

levels.

A comparative analysis of 2017-2018 and 2019-2020 shows that the pandemic heightened the sensitivity of innovation to human capital in countries with higher human capital. However, this effect was unchanged in underdeveloped countries and less pronounced in developing countries compared to developed ones. Notably, developing countries experienced greater polarization in these indicators. For example, Malaysia, with moderate human capital but high innovation, moved from the second to the first quadrant in 2017, while countries like Kazakhstan, Serbia, and Russia, despite having high human capital, have lower innovation levels, keeping them in the fourth quadrant.

During the pandemic, both innovation and human capital levels declined, shifting these countries from a positive trajectory in the fourth quadrant to the first. This shows how the lockdown significantly hindered developing countries' potential to close the economic development gap with developed nations.

For rapidly developing countries like Malaysia, the pandemic had a less pronounced impact, possibly due to shifts in production capacities and innovations from developed countries to Southeast Asia. This transformation of socio-economic development into a more complex economy, with deep labor division, led to new skills, educational reforms, and enhanced healthcare systems, ultimately boosting human capital.

The pandemic highlighted the varying effectiveness of government institutions. Countries that maintained their human capital levels owe this to the strength of their institutions. For instance, Singapore, the UK, and France managed a smooth transition to new employment and learning formats, ensuring a continuous innovation process. This allowed these countries to sustain and even improve their human capital and innovation link, positioning them for the sixth technological paradigm.

Countries like Kazakhstan, Russia, and Serbia, which had existing but underused production capacities, faced a difficult transformation from degradation to modernization, particularly in export-oriented industries, aligning with modern technological developments only in the last decade. This shift required new skills, leading to human capital accumulation in some sectors and migration in others. In the 1990s, many highly qualified scientific personnel from Russia and other former socialist nations emigrated due to a lack of demand.

The migration process also adapted to new labor market conditions. Some specialists acquired new skills, while others integrated into scientific communities abroad, contributing to a new wave of human capital accumulation.

The uneven relocation of production capacities allowed some Southeast Asian nations to transform their resources and achieve levels comparable to developed countries. Singapore, a leader in both innovation and human capital, exemplifies this trend, much like South Korea's transformation during industrialization in the 1970s and 80s.

Industrialization facilitated global economic development for about 70-80 years, surpassing the 50-year technological cycle predicted by Kondratiev. This extension can be attributed to the different timing of industrialization in various countries or the transfer of production capacities from developed to underdeveloped nations.

The transfer of production capacities from countries like the US, UK, and Germany to Southeast Asia prolonged the life of technologies from the fourth and fifth paradigms, allowing production to continue in older technological systems. However, this potential has now been exhausted, especially in developed countries [9].

Analysis of the relationship between innovation and economic development, as measured by GDP per capita, shows that only a small number of developed countries are fully mastering the new technological paradigm. Successful transitions to the sixth paradigm are seen in countries like the US, Switzerland, the UK, Sweden, and Hong Kong, while China remains in the catch-up group

in the fourth quadrant.

Most developed and developing European countries fall into the fourth quadrant, with some transitioning to the first quadrant. Most countries worldwide are in the third quadrant, with weak innovation sensitivity to GDP, indicating underdevelopment and insufficient conditions for transitioning to the new technological paradigm, mainly due to inadequate human capital for a digital economy.

It is essential to note that the pandemic's impact on the relationship between GDP per capita and innovation was not explicitly evident in this analysis. The trends for all country categories remained stable between 2018 and 2020, indicating that the relationship between GDP and innovation is influenced by long-term factors, while temporary disruptions, such as the pandemic, do not significantly affect this relationship in the short run.

CONCLUSION

Research reveals that investments in high-tech sectors are unproductive when human capital is at low levels of quality, especially during technological shifts. The rapid advancement seen in countries like Finland, Ireland, Japan, China, Korea, and newly developed European nations such as Greece, Spain, and Portugal, underscores the importance of enhancing overall education levels and cultural standards among the populace for effective human capital formation.

The study indicates that Russia boasts high human capital and per capita income. Over the past decade, global demand for commodities, particularly hydrocarbons and metals, has significantly raised Russia's income levels, reinforcing the link between human capital and per capita GDP. Consequently, Russia stands in the first quadrant alongside developed countries in Europe, America, and Japan regarding GDP per capita and human capital levels.

However, an analysis of the relationship between innovation and human capital in countries, including Russia, shows a less strong connection (falling into the fourth quadrant with high human capital but moderate innovation levels). This weaker link is attributed to a longer period needed for innovation implementation compared to other developed nations. Additionally, the uneven distribution of innovations across various economic sectors in Russia may explain the lower sensitivity between innovation and human capital.

To enhance innovation development, institutions need to implement measures in six key areas:

Education: Align the education system with real economic demands and adequately prepare the workforce.

Science: Support state institutions and create state orders for research institutes to develop and implement innovations.

Human Capital: Elevate the overall role of human capital by investing in education, healthcare, and improving living standards.

Innovation Infrastructure: Develop an innovation system through improved regulatory frameworks and investments in technology transfer centers, technoparks, technopolises, innovation centers, clusters, and high-tech zones.

Real Sector: Support high-tech exports, modernize the industrial complex, and back innovative enterprises and startups.

Creative Potential: Promote a conducive environment for scientific, educational, and creative activities, particularly for the youth.

Establishing these conditions will strengthen the connection between human capital and innovation, thus enhancing the GDP-innovation link. Without these critical elements, Russia's transition to a higher development tier appears unlikely.

In summary, the theoretical significance of this research lies in analyzing theoretical

approaches and defining "human capital," as well as examining its relationship with innovation activity and state GDP. Practically, this research formulates the necessary conditions for human capital development and offers recommendations to authorities for its enhancement in the country.

Incorporating strategic planning methodologies and considering alternative management decisions are essential in creating effective policies for human capital and innovation growth. Strategic planning helps set long-term goals and determine actions, while alternative management decisions provide flexibility to adapt to changing economic conditions and technological advancements. By integrating these approaches, Russia can more effectively navigate the complex landscape of human capital and innovation development.

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FINANCIAL RISK ASSESSMENT IN MEDICAL ROBOTICS: THE IMPACT OF MRI PHYSICS AND IMAGE ANALYSIS ON HEALTHCARE COSTS

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ABSTRACT

The integration of medical robotics and advanced imaging technologies, particularly MRI physics and image analysis, has revolutionized healthcare delivery. However, these innovations introduce financial risks, including high initial investment costs, operational expenses, and the potential for cost overruns in implementation. This paper explores the financial risks associated with medical robotics in healthcare, focusing on the role of MRI physics and image analysis in influencing these costs. Key strategies for mitigating these risks are also discussed.

Keywords: Medical Robotics, Financial Risk Assessment, MRI Physics, Image Analysis, Healthcare Costs

INTRODUCTION

Medical robotics has revolutionized healthcare by introducing unprecedented precision and efficiency in both diagnostics and surgical procedures. By combining robotics with advanced imaging technologies, medical professionals can perform complex tasks with greater accuracy and less risk to patients. One of the most significant technologies integrated into medical robotics is magnetic resonance imaging (MRI), which provides high-resolution imaging essential for accurate diagnosis and treatment planning. MRI enables real-time visualization of the body's internal structures, allowing surgeons to navigate complex procedures with unparalleled precision.

The integration of MRI physics and advanced image analysis into medical robotics systems enhances their capabilities, enabling minimally invasive surgeries, faster recovery times, and improved patient outcomes. The ability to combine robotic precision with detailed MRI scans offers a new level of accuracy in diagnosing conditions such as tumors, neurological disorders, and cardiovascular diseases. Furthermore, MRI-based image analysis can be used for pre-operative planning and post-operative monitoring, ensuring better surgical outcomes.

However, the incorporation of MRI into medical robotics also introduces significant financial implications. The development, installation, and maintenance of these advanced systems require substantial investment in both hardware and software, as well as ongoing costs for training medical professionals and ensuring regulatory compliance. While these technologies hold immense potential to improve healthcare delivery, understanding and managing the associated financial risks is crucial for their sustainable adoption. Healthcare providers must assess the cost-benefit ratio, explore financing options, and implement risk management strategies to ensure that these innovations remain financially viable. By addressing these challenges, the full potential of MRI-integrated medical robotics can be realized, improving patient care while maintaining financial sustainability.

THE FINANCIAL IMPLICATIONS OF MRI IN MEDICAL ROBOTICS

MRI-based medical robotics systems require sophisticated hardware and software integration. The financial risks stem from the following factors:

High Initial Investment Costs. The development and procurement of MRI-compatible robotic systems involve substantial capital investment. For instance, the production of non-ferromagnetic robotic components to ensure compatibility with MRI's strong magnetic fields is cost-intensive. These specialized components are essential to prevent interference with the magnetic field, ensuring that the robotics system operates seamlessly within the MRI environment. Additionally, such components require advanced manufacturing techniques, which further drive up costs. The demand for precision engineering and compliance with stringent safety standards adds to the financial burden. As a result, the initial capital investment in MRI-compatible robotic systems becomes a critical consideration for healthcare facilities [1].

Operational and Maintenance Expenses. The operational costs of medical robotics encompass several significant factors, including energy consumption, routine maintenance, and the employment of highly skilled professionals to manage and operate these advanced systems. When MRI imaging is integrated, these expenses rise further due to the complexity of software and hardware synchronization needed for real-time image-guided procedures. The demands for precise calibration, ensuring compatibility with MRI's magnetic fields, and maintaining high image quality add layers of financial burden. This integration requires continuous technological updates and expert oversight, making it a resource-intensive aspect of modern medical robotics applications [2].

Unpredictable Cost Overruns. Cost overruns often arise during the implementation phase of integrating MRI physics into robotic systems. These overruns are primarily driven by unforeseen technical challenges that require additional resources and expertise to address. For instance, signal interference caused by MRI's strong magnetic fields can compromise system functionality and necessitate specialized engineering solutions. Similarly, maintaining high-quality imaging during robotic operations demands advanced shielding mechanisms to prevent distortions, adding further complexity and expense to the process. These factors can significantly increase the financial burden on healthcare institutions, highlighting the importance of meticulous planning and risk assessment during the integration phase [3].

IMPACT OF IMAGE ANALYSIS ON HEALTHCARE COSTS

Advanced image analysis algorithms are central to enhancing the capabilities of medical robotics. These algorithms, driven by machine learning and artificial intelligence, enable precise interpretation of MRI data. However, their implementation introduces the following financial risks:

Algorithm Development and Validation. Developing robust algorithms for image analysis involves a complex and resource-intensive process that requires extensive computational power and the expertise of interdisciplinary teams. These algorithms are designed to interpret and process large volumes of visual data, which necessitates advanced machine learning techniques, data processing tools, and high-performance computing infrastructure. As a result, the development of such algorithms demands significant investments in research and development (R&D). Collaboration among computer scientists, engineers, data scientists, and domain-specific experts is crucial to addressing the technical challenges involved, such as improving accuracy, reducing processing time, and optimizing the algorithms for real-world applications. These efforts often result in considerable expenditures on both hardware and software, as well as personnel, to ensure the development of cutting-edge image analysis solutions capable of solving complex problems across various industries [4].

Data Storage and Processing Costs. The large volume of high-resolution MRI data generated by advanced imaging technologies presents significant challenges in terms of storage and processing. The sheer size of these datasets requires sophisticated storage solutions capable of handling vast amounts of information. Additionally, the need for high-performance computing (HPC) infrastructure to process and analyze this data efficiently places a considerable strain on resources. As a result, hospitals and research institutions face increased operational costs due to the ongoing need to invest in robust storage systems, powerful computing capabilities, and specialized software to ensure optimal data handling and analysis. This continuous demand for cutting-edge technology drives up expenses, making it essential to seek innovative, cost-effective solutions for managing high-resolution MRI data [5].

Regulatory and Compliance Challenges. Compliance with healthcare regulations and data protection laws adds another layer of financial risk, as ensuring data security and privacy in image analysis systems is resource-intensive. These regulations often require the implementation of stringent measures, including encryption, secure storage, and access controls, which can significantly increase operational costs. In addition to the financial burden of compliance, organizations must also invest in regular audits, employee training, and risk management systems to mitigate potential breaches. The continuous evolution of these laws means that healthcare providers and technology vendors must stay up-to-date, which further complicates the management of these systems and increases financial pressures. The costs associated with both preventative measures and potential penalties for non-compliance can strain the financial resources of organizations in the healthcare sector [6].

STRATEGIES FOR MITIGATING FINANCIAL RISKS

To minimize financial risks, healthcare providers and stakeholders can adopt the following strategies:

Cost-Benefit Analysis. Conducting comprehensive cost-benefit analyses before investing in MRI-integrated medical robotics systems is essential for identifying potential financial pitfalls. This analytical approach ensures a thorough understanding of both the upfront costs and long-term benefits, including operational efficiency, patient outcomes, and technological advancements. By carefully evaluating financial projections, healthcare providers can make informed decisions that balance investment risks with anticipated returns. Furthermore, identifying hidden costs, such as maintenance, training, or integration with existing systems, allows organizations to avoid unexpected financial burdens. Ultimately, such analyses provide a strategic framework for optimizing resource allocation and maximizing the impact of advanced medical technologies in clinical settings [7].

Collaborative Funding Models. Collaboration between governments, private investors, and healthcare institutions is essential in addressing the financial challenges within healthcare systems. By pooling resources, these entities can share the economic burden, reducing the strain on any single group. Governments can offer regulatory support and public funding, while private investors can inject capital, spurring innovation and improving efficiency. Healthcare institutions play a pivotal role in managing and delivering services. This collective approach not only distributes the financial load but also mitigates individual risk exposure, ensuring that both providers and consumers are better equipped to handle unforeseen healthcare costs. Such partnerships can lead to sustainable healthcare models that benefit all stakeholders [8].

Standardization and Modular Design. Standardizing components and employing modular designs can significantly lower production costs by simplifying the manufacturing process. These approaches allow for the use of interchangeable parts, reducing the need for custom components and decreasing both material and labor costs. Additionally, modular designs enable easier upgrades and modifications, which can extend the product's lifecycle and improve

its adaptability to future advancements. As a result, businesses can respond more efficiently to market changes and technological innovations. Over the long term, these strategies help mitigate financial risks by minimizing production complexities, reducing maintenance costs, and allowing for cost-effective improvements and replacements, ultimately leading to more sustainable and profitable operations [9].

CONCLUSION

The integration of MRI physics and image analysis in medical robotics presents exciting opportunities for advancing healthcare. These technologies enable precise diagnostics, real-time monitoring, and minimally invasive treatments, all of which can significantly improve patient outcomes. MRI's ability to provide high-resolution imaging, when combined with the precision of robotic systems, allows for more accurate surgeries and treatments, enhancing both the effectiveness and safety of medical procedures. Additionally, image analysis through artificial intelligence can assist in diagnosing conditions early, leading to better patient prognoses.

However, the adoption of these innovations brings substantial financial risks that cannot be overlooked. Developing, implementing, and maintaining medical robotic systems integrated with MRI technology involve considerable costs, including research and development, regulatory compliance, training, and system maintenance. These expenses can strain healthcare budgets, especially in institutions with limited resources. Moreover, the integration of cutting-edge technology may face unpredictable operational challenges, which can further escalate costs.

To ensure the financial viability of these advancements, careful risk management is essential. Healthcare providers and stakeholders must understand the full cost dynamics involved, from initial investment to long-term operational costs. Strategic risk mitigation measures, such as phased implementation, cost-benefit analyses, and securing funding or partnerships, can help alleviate financial pressures. By carefully balancing the benefits of these technological advancements with effective cost management strategies, stakeholders can leverage the full potential of MRI and robotics in medical care, achieving both improved healthcare outcomes and financial sustainability.

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Sociological Sciences

FORMS AND METHODS OF PREVENTION OF ADMINISTRATIVE OFFENSES IN THE RELIGIOUS SPHERE IN KAZAKHSTAN: DIRECTIONS, PROBLEMS, EXPERTISE

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Introduction

The religious sphere has always been a very sensitive area of public relations. In many countries, religion plays a key role in interaction with society.

The relevance of this article is due to the changing processes of state-confessional relations over time not only in the Republic of Kazakhstan, but also throughout the modern world. The emergence of new religious movements of a destructive nature, the problems of extremism and terrorism force any state to respond in a timely manner to threats to public and national security.

The most important aspects of combating offenses are their prevention, elimination of the causes and conditions that have led to harmful and dangerous acts for society or contribute to their commission.

It is necessary to emphasize that offenses cannot be eradicated by fighting only directly against them, but their number can be significantly reduced through comprehensive and systematic measures.

In the Republic of Kazakhstan, the prevention of offenses in the religious sphere is a multi-vector, interdisciplinary and comprehensive activity of state structures.

This article has been prepared on the basis of an analysis of existing practices in the prevention of administrative offenses, as well as data from a sociological study conducted by the authors.

Legislative aspects and subjects of prevention

The key law regulating crime prevention work is the Law of the Republic of Kazakhstan dated April 29, 2010 No. 271-IV "On the Prevention of Crimes" (as amended and supplemented as of 07.07.2020).

According to Article 1 of the Law "On the Prevention of Offences", the prevention of offences is defined as "a set of legal, economic, social and organizational measures implemented by subjects of offence prevention, aimed at maintaining and strengthening law and order by

identifying, studying, and eliminating the causes and conditions that contribute to the commission of offences” [1].

The main subjects of prevention of administrative offenses in the sphere of religion under articles concerning religion: 453, 489, 490 of the Code of Administrative Offenses of the Republic of Kazakhstan [2] in accordance with Chapter 2 of the Law “On Prevention of Offenses” are:

- 1) Departments of Religious Affairs under the Akimats of the country's regions,
- 2) Departments of Internal Affairs,
- 3) Departments of Internal Policy,
- 4) Departments of Youth Policy,
- 5) Departments of Education,
- 6) Information and Explanatory Groups.

The competence of the above-mentioned state bodies and information and explanatory groups includes:

- ensuring interaction between subjects of crime prevention at the local level;
- registration of citizens and organizations participating in crime prevention;
- promoting employment of the population;
- organizing special services for persons in difficult life situations;
- ensuring the organization of legal education of citizens.

It is important to note that the purpose of crime prevention is to protect individuals, society and the state from illegal attacks, as well as the timely prevention of crimes [3, p.48-49].

Target groups for prevention

The target groups with whom preventive work is carried out under articles 453, 489, 490 of the Code of Administrative Offenses are:

- leaders and members of religious associations, parishioners;
- individual entrepreneurs, legal entities, organizations;
- persons without stable financial income or low-income. According to expert interviews, these usually include the self-employed, bazaar workers, the unemployed;
- the marginal part of the population;
- youth: students, school and college students, rural youth;
- workers of mines, oil producing organizations in the Mangistau, Atyrau, Karaganda regions.

Religious expertise

In the Republic of Kazakhstan, religious expertise is carried out on the materials specified in the law. Thus, the objects of expertise include: constituent documents of religious associations; documents of religious content (containing the structure, fundamentals of doctrine, religious practice, forms and methods of religious activity); spiritual (religious) educational programs; information materials of religious content, religious literature and religious items [4]. It is important to note that this process is digitalized and simplified. Thus, an individual or legal entity can contact the nearest Public Service Center or submit material for religious expertise online. The entire process is as accessible as possible. All deadlines are strictly regulated and observed with each request. The expertise is carried out by highly qualified specialists. Religious expertise is carried out both by experts from the state body (Committee on Religious Affairs) and within the framework of legal proceedings, by experts who have the right to conduct forensic religious expertise.

The expertise is also carried out on materials from religious associations that are not officially registered in the country (Neo-Tengrian groups, some Baptist communities, New Age groups, etc.)

In general, religious expertise is an important tool in preventing offenses in the religious sphere and ensuring the spiritual security of the country's citizens.

Coordination of activities of misdemeanor prevention entities

According to the Law "On the Prevention of Offences", interdepartmental commissions for the prevention of offenses are responsible for coordinating the activities of offense prevention entities. These commissions are formed under local executive bodies of regions, cities and districts. The commission is of a consultative and advisory nature and is held quarterly on the basis of akimats and internal affairs agencies. The chairman, as a rule, is the ruler (akim) of the region. The number of members varies depending on the region.

In addition to the interdepartmental commission, meetings and conferences are held on a regular basis that directly relate to the prevention of offenses under articles 453, 489, 490 between authorized bodies.

According to expert interviews, such events are held throughout the Mangistau, Atyrau, Pavlodar, and West Kazakhstan regions. In some regions, government agencies hold preventive meetings with representatives of religious associations to explain laws concerning corruption, bribery, and administrative offenses in the area of religion.

Basic measures and methods of misdemeanor prevention

According to the Law "On the Prevention of Offences", the work is carried out in the forms of general and individual (targeted) impact on the objects of offence prevention.

Within the framework of the legislation, general measures for the prevention of offenses in the sphere of religion are implemented by applying:

1. organizational and managerial measures aimed at eliminating errors and omissions in the management of the economy, social sphere, law enforcement activities, as well as improving the regulatory, informational, methodological and resource support for the prevention of offenses;

2. ideological measures aimed at developing moral qualities in citizens oriented towards universal human values, law-abiding behavior, intolerance of unlawful behavior, increasing the general, every day and legal culture.

As part of the first general preventive measure under articles 453, 489 and 490, local executive bodies implement various forms and methods. Religious associations, mass media mechanisms, as well as modern capabilities of social networks and the Internet are actively involved.

Preventive work with religious associations

The functioning of clubs and councils of religious associations is a typical method of general crime prevention among all regions of Kazakhstan [5].

Thus, regional structures are constantly working with religious associations to explain the norms of legislation.

For example, in the Mangistau region, monthly meetings are held with religious associations.

In the Almaty region, club meetings with religious organizations leaders are held four times a year, a group has been created in the WhatsApp application for employees of the Department of Religious Affairs and leaders of religious associations of the region, in which current issues in the religious sphere are raised, the rights and obligations of religious associations are explained, and up-to-date information is provided.

In the Aktobe region, at the Club of Representatives of Local Religious Associations, meetings are held in official and unofficial formats (meeting, meeting "at the dastarkhan") in order to discuss the religious situation in the region, problematic issues. If necessary, employees from the prosecutor's office and the police department are invited to the Club meetings. At such

meetings, examples of administrative violations (specific cases) by religious associations are raised, the reasons that led to the violation are discussed, and explanations of the legislation on articles of the Code of Administrative Offenses and the Law "On Religious Activity and Religious Associations" [6] are given, and leaflets and brochures are distributed.

In the Pavlodar region, the Club of Leaders of Religious Associations has a consultative and advisory nature. However, there are limitations, since the recommendations state that it should only include representatives of traditional faiths. Other religious movements and associations in this case are not included in the general discussion of current issues.

It is important to note that, according to expert interviews, established cooperation with religious associations helps to suppress illegal missionary activities of various non-traditional teachings that have arrived from abroad. Local religious associations receive information about such missionaries through parishioners and inform government agencies.

Problematic aspects of preventive activities

Due to the large number of offenses committed by adherents of Islamic movements, local executive bodies of Kazakhstan pay special attention to working with imams. According to experts, it is imams who should work with their "jamagat" in order to conduct explanatory work and prevent violations. In some mosques of the country, during religious events, legal norms, administrative offenses, and punishments are explained.

According to experts, there is also one common problem for almost all regions - this is working with the religious organization "Jehovah's Witnesses" and representatives of Baptism. Adherents of Jehovah's Witnesses and Evangelical Christians-Baptists refuse and in almost all cases ignore the above-mentioned events. In these cases, for example, in Aktobe, work is carried out with representatives of the religious association "Jehovah's Witnesses" on an individual basis, and they are also open to researchers.

In general, it is worth noting the positive aspect in relation to the work of regional authorized bodies with religious associations [7]. According to expert interviews, in all regions of the country there are widespread meetings, discussions and active, open dialogues with representatives and leaders of religious associations.

Preventive work in the media

Prevention of violation of the law in the modern world directly depends on the correct and timely informing of the population.

The regions have accumulated significant experience in the prevention of administrative offenses through the media.

The Departments of Religious Affairs regularly publish various materials on information portals. Popular bloggers are also involved in this work, who publish information posts and digests on their pages in social networks.

The regions use local television and newspapers, where materials aimed at preventing offenses are published. The topics are very different: from the interpretation of legislation to commenting on various religious traditions.

As the study showed, all regions of Kazakhstan are actively involved in the use of mass media resources for the purpose of preventing administrative offenses.

The experience is approximately the same in all regions - this is the participation of employees of authorized bodies in television and radio programs devoted to religious issues, the publication of informational and explanatory articles in newspapers and magazines.

In order to prevent and detect offenses at an early stage, monitoring of public gathering places (shopping houses, taxi stands, markets and other spontaneous places of people's gatherings) is carried out by employees of the internal affairs bodies and local executive bodies.

In general, all Departments of Religious Affairs in Kazakhstan maintain official pages on social networks and the Internet. Various materials on the prevention of religious extremism and administrative violations are published on the accounts of the departments. In the Internet space, warning materials are also distributed, monitoring and involvement in discussions on Internet platforms and communities where religious issues are actively discussed is carried out.

Conclusion

The constitution of the Republic of Kazakhstan proclaims freedom of conscience for its citizens and ensures this by all available legal issues [8].

In general, in the Republic of Kazakhstan, preventive work in the religious sphere is comprehensive and aimed at preventing religiously motivated extremism and terrorism. During the interview, experts noted the extensive work carried out in the regions in the field of preventing offenses in the religious sphere.

Thus, preventive work in Kazakhstan includes a range of fundamental aspects: ideological measures, individual and collective preventive measures. Of course, there are special cases of problematic issues in the regions, such as staff turnover due to low wages, insufficient legal literacy of employees, employee safety during visits to representatives of destructive movements, and the lack of consistency in preventive work.

In general, the analysis shows that preventive activities in the religious sphere in Kazakhstan have positive dynamics.

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Biological Sciences

ПИРОЛИЗ ЖОЛЫМЕН КҮРІШ ҚАУЫЗЫНАН АЛЫНҒАН БИОКӨМІРДІҢ МЕЛИОРАНТ РЕТІНДЕГІ РӨЛІ

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Аннотация. Мақалада өнеркәсіптің шығарындыларымен ластанған топырақтарға мелиорант ретінде биокөмірдің әсерін зерттеу нәтижелері келтірілген. Топырақтың су-физикалық қасиеттерін жақсарту үшін күріш қабықшасын пиролиздеу жолымен алынған биокөмірдің маңызы зор. Биокөмір топырақтардың түйіртпектік агрегаттарын жақсартуға және ылғалды ұстап қалуға, ауыр металдарды топырақтан сіңіріп алуға елеулі әсер етеді.

Түйінді сөздер: ластанған топырақтар, мелиорант, биокөмір, өнеркәсіптің шығарындылары ластану

ROLE OF BIOCHAR AS RICE HUSK MELIORANT BY PYROLYSIS

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Abstract. The article presents the results of studies of the impact of biochar on soils polluted by industrial emissions as meliorants. Content of biochar obtained by pyrolysis of rice shell to improve water-physical properties of soils. Biochar has a significant impact on the improvement of granular soil aggregates and moisture retention, the absorption of heavy metals from the soil..

Keywords: contaminated soils, meliorant, biochar, pollution of industrial emissions

Өзектілігі. Жер биосферасына 500 мыңнан астам химиялық заттар - техногенез өнімдері келіп түседі, олардың басым бөлігі топырақта жинақталады. Олардың арасында қауіптілік дәрежесі бойынша пестицидтерден кейін қалған ауыр металдар ерекше орын алады. Түсті және қара металлургия кәсіпорындары жыл сайын Cu - 150-ден астам, Zn - 120, Pb - 90-ға жуық, Ni - 12, Mo - 1,5 мың тонна, ал Co - 800, Hg - 30 т. қосындыларын шығарады. Машина жасау және химия өндірістерінің қалдықтары Pb - 1-ге дейін, Cu - 3-ке дейін, Cr, Fe, Nn, Ni - 10 г/кг дейін қосылыстардан тұрады. Пайдаланылған газдармен жыл бойы топырақтың бетіне 250 мың тоннадан астам қорғасын түседі. Адам қызметінің нәтижесінде топырақтағы металдардың құрамы олардың табиғи шоғырлануынан жүздеген және мыңдаған есе асуы мүмкін. Ауыр металдар топырақтың құрамына, қасиеттеріне және оның құнарлылығына теріс әсер етеді. Ауыр металдардың топырақтың биологиялық қасиеттеріне теріс әсерінің себептері, бұл металдар нәруыздардың сульфгидрильді топтарымен

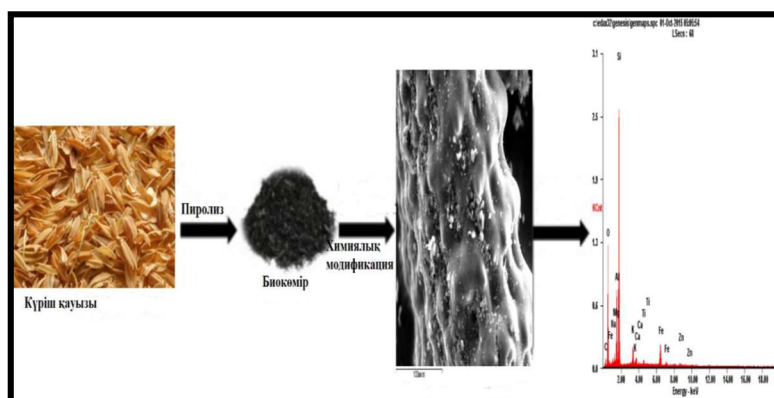
байланыстыра отырып, бір жағынан нәруыздардың, оның ішінде олардың ферменттерінің синтезін тежейді, екінші жағынан - биологиялық мембраналардың өткізгіштігін өзгертеді, бұл зат алмасудың бұзылуына әкеледі. Ауыр металдар топырақтағы әртүрлі заттардың минералдану және синтез үрдістерін тежейді, топырақ микроорганизмдерінің тыныс алуын тежейді, микробостатикалық әсер туғызады, мутагендік фактор ретінде шығуы мүмкін. Ауыр металдар топырақтың ферментативтік белсенділігіне теріс әсер етеді. Топырақтан өсімдіктерге келіп және тамақтану тізбегі бойынша берілсе, ауыр металдар өсімдіктерге, жануарларға және адамға уытты әсер етеді [1-5]. Қазіргі уақытта ауыр металдармен ластанған жерлерді қалпына келтірудің әртүрлі тәсілдері бар, олардың арасында биокөмірді пайдалана отырып тазартудың сорбциялық әдісі неғұрлым үнемді және тиімді болып табылады. Биокөмір - бұл көміртегіге бай өнім, ол оттегіге қол жеткізбей ағашты, көңді, жапырақтарды және т.б. термиялық өңдеу арқылы алынады. Ластану деңгейі мен типіне байланысты саз балшық, цеолиттер, апатиттер сияқты минералды сорбенттер қолданылады. Бұл сорбенттер тереңдікке енгізіледі және алынуға және кәдеге жаратылуға жатпайды. Қолданылатын сорбциялық материалдардың жақсы сорбциялық сыйымдылығы болуы, биodeградацияға ұшырамауы, температураның өзгеруіне төзімді болуы тиіс. Соңғы уақытта әдеби дереккөздерде топырақты ауыр металдардың иондарынан тазартуға мүмкіндік беретін өсімдік шикізатынан жасалған әртүрлі сорбенттер (үгінділер, лигнин, қылқан жапырақтарының қалдықтары және т.б.) ұсынылады. Топырақты тазарту үшін жыл сайын жаңартылатын шикізаттан (күріш қауызы, жаңғақ қабығы) биокөмірдің жаңа түрлерін әзірлеу ғылыми, сондай-ақ практикалық қолдануда өзекті болып табылады. Биокөмірді егістік жерлерге қосу топырақтың құнарлылығын жақсартыады [6-8].

Шаруашылық қызметтің қоршаған ортаға теріс әсерін болдырмауға бағытталған ауыл шаруашылығы дақылдарын өңдеудің ресурс үнемдейтін жаңа технологияларын әзірлеу және енгізу қазіргі уақытта басым және өзекті болып табылады. Аталған технологиялардың қатарына пиролиз жолымен жаңартылатын биомассаны карбонизациялау жатады. Құрғақ пиролиз нәтижесінде - шаруашылық қызметте пайдаланылмайтын, ал оны сақтау ортаның экологиялық жағдайын бұзуы мүмкін биомассаны жоғары температурада (400-800 ° C) көмірге айналдыру арқылы, оттегісіз ортада биокөмір алынады. Өнім тұрақты полиароматикалық көмірсутектердің жоғары құрамымен, қосылу тығыздығының төмендігімен және жоғары адсорбциялық қабілетімен сипатталады, ал оны топыраққа енгізу топырақтың физикалық, биологиялық және химиялық жай-күйін жақсартуға, топырақтан жылыжайлық газдар эмиссиясын азайтуға ықпал етеді. Құрғақ пиролизге балама ылғалды пиролиз - гидротермиялық көмір алу нәтижесінде 180-300 ° C температурада биомассаны (НТС - *hydrothermal carbonization*) күйдіру болып табылады, нәтижесінде гидрокөмір алынады. Құрғақ пиролизден айырмашылығы технология энергияны аз жұмсайды және ылғалды температура мен қысымды (1-5 • 10⁶ Па ~) және судың қатысуымен пайдалануға мүмкіндік береді. Гидрокөмірлердің гидрокөмірде бекітілген көміртегінің үлесі шамамен 70-80% биокөмірге қарағанда Н/С және О/С неғұрлым жоғары атомдық арақатынасы бар. Қазіргі уақытқа дейін жүргізілген зерттеулердің нәтижелері бойынша биокөмірдің ауыл шаруашылығындағы карбонизацияланған экологиялық мәні, өйткені топыраққа енгізу кезінде топырақ құнарлылығына, өсімдіктердің өсуі мен дамуына оң әсер етеді. Өсімдік қалдықтарының экологиялық қауіпсіз пиролизін қолдану жылыжайлық газдардың антропогендік эмиссиясын жыл сайын 12% -ға төмендетуге қабілетті деп есептелді. Алайда, ауыл шаруашылығында карбонизацияланған материалдарды пайдалану перспективалары осы сәтке дейін ашық күйінде қалып отыр, олардың топырақ құнарлылығына және парниктік газдар эмиссиясына әсерін зерттеу жөніндегі зерттеулер әлемде осы уақытқа дейін өзекті болып отыр. Биокөмірді топырақты жақсартушы ретінде қолдану, оның топырақтың агрохимиялық және микробиологиялық қасиеттеріне әсер етуімен ғана емес, сонымен қатар

өсімдіктерді қолжетімді ылғалдылықпен қамтамасыз етуге байланысты болатын топырақтың су-физикалық қасиеттерне де байланысты. Мұндай қасиеттерге бірінші кезекте су өткізгіштігі мен ылғал сыйымдылығы жатады. Топырақтың су өткізгіштігі - топырақтың жер бетінен келетін суды өзі арқылы өткізу қабілеті. Топырақтың атмосфералық жауын-шашынды немесе суармалы суларды қабылдау дәрежесі, топырақтың үстіңгі және ішкі ағынының қалыптасуы, су эрозиясы үрдістерінің қарқындылығы топырақтың су өткізгіштігіне байланысты. Ылғал сыйымдылығы - топырақтың суды өзінде ұстап тұру қабілеті. Судың қандай түріне қатысты осы қасиет қаралатынына байланысты ылғал сыйымдылығының әртүрлі түрлері болады. Екі көрсеткіш де гранулометриялық құрамға, гумусталуға, топырақтың құрылымдылығына және т.б. байланысты. Алайда, барлық топырақтың су өткізгіштігі мен ылғал сыйымдылығының оңтайлы параметрлері жоқ. Мысалы, құмды топырақ, әдетте, артық су өткізгіштікке ие, бірақ ылғал сыйымдылығы төмен, яғни өсімдіктер үшін жеткілікті су қорын ұстап тұра алмайды. Ауыр құрылымсыз топырақ, керісінше, ылғалдың үлкен қорын ұстап тұруы мүмкін, бірақ су өткізгіштігі нашар, оңай жайылып кетеді, үлкен тығыздығымен ерекшеленеді. Осы себептен жеңіл құмды және түйіршікті құрамы бойынша ауыр топырақ өсімдіктердің өсуіне қолайсыз. Әдетте олардың қасиеттерін жақсарту үшін шара ретінде құмдау немесе балшықтандыру ұсынылады, бірақ бұл рәсімдер соншалықты еңбекті қажет ететіндіктен, ауыл шаруашылығы алқаптарының топырағын жақсарту үшін оны іс жүзінде пайдаланбайды. Топырақтың су-физикалық қасиеттерін жақсартушы ретінде гранулометриялық құрамын өзгерту қағидаты бойынша емес, топыраққа аз енгізу талап етілетін қандай да бір басқа механизм бойынша әрекет ететін басқа компоненттерді пайдалануға әрекеттер жиі жасалады. Олардың бірі биокөмір болуы мүмкін.

Топырақ құнарлылығын арттыру үшін және ластанған топырақтарға мелиорант ретінде қодануда биокөмір маңызды элемент болып табылады. Биокөмір өзіндік қасиеттерінің арқасында гумус және қоректік элементтер жетіспейтін топырақтардың сапасын жақсарту үшін ауыл шаруашылығында қолдануға арналған маңызды мелиорант болып табылады. Күріш қабығының қалдығы топырақ құнарлылығын арттыруға арналған жоғары сапалы органикалық затқа қайта өңделеді. Биокөмір топырақтың қоректік құрамын және ылғалдылығын арттырып, қышқылдылығын реттейді ол өзінің жабысқақтық қасиеті арқылы топырақтың бөлшектерін жел және су эрозияларынан да қорғау қызметін атқарады. Көміртегінің топырақта сақталуын қамтамасыз етіп, микробиологиялық үрдістерге қолайлы жағдай туғызу арқылы топырақтың потенциалдылығын және өнімділікті арттырады. Азот тотықтарының атмосфераға шығарылымын азайтып, топырақты климаттың қолайсыз факторларынан қорғайды [9, 10].

Биокөмір - өсімдіктердің биологиялық өнімдерін оттегісіз жағдайда жоғары температурада 300 ден 500 °C аралығында органикалық материалдарды термохимиялық ыдырату арқылы дайындалатын биологиялық өнім (1-сурет). Оның құрамы органикалық заттардан тұрады және көміртегі 70-80 %-ды құрайды [11].



1- сурет - Күріш қауызы, биокөмір және спектралды талдау

Биокөмірде минералдық және қоректік заттардың мол болуымен қатар, топырақта қуысты құрылымдар түзеді. Топырақтың су ұстау қасиетін, алмаспалы катиондардың және сіңіру кешендерін жақсартады. Сондай-ақ, топырақтың құнарлылығына және өнімділікке кері әсер ететін факторлармен қарсы күресуге қабілеті болуымен қатар, қара шірінді мөлшері аз топырақтардың құнарлылығын арттыруға және топыраққа енгізілген тыңайтқыштарды өсімдіктердің біртіндеп сіңіруіне мүмкіндік жасайды [4-8]. Биокөмірдің қоректік құрамы және пайдалы қасиеттері өсімдіктердің биологиялық өнімділігіне және өңдеу технологиясына байланысты [9]. Биокөмір топырақтың мынадай бірнеше қасиеттеріне әсер етеді:

- (1) көміртегінің топырақта сақталып қалуына әсер етеді.
- (2) топырақтың құнарлылығын арттырады.
- (3) ластаушы заттарды өзіне сіңіріп ұстау қабілетіне ие
- (4) Топырақтағы микробиологиялық әртүрліліктің өзгеруіне, функционалды топтардың ауысуына әсер етеді.
- (5) топырақтың тығыздылығын азайтады [10, 11].

Биокөмір тұзды жақсы сіңіретіндіктен ауыр тұзданған топырақтарды мелиорациялауға және ауылшаруашылығы өнімдерінің үрдістерден артуына, сондай-ақ, ластанған топырақтарды жақсартады. Биокөмір топырақта мекендейтін микроорганизмдер үшін қолайлы қоректік орта болып табылады. Топырақта тіршілік ететін микроорганизмдер биохимиялық үрдістерге қатысып, өсімдік қалдықтарының ыдырауына, басқада заттардың минерализациялануына мүмкіндік тудырады. Биокөмір өсімдіктерді ұлы химиялық элементтерден қорғайды. Ғалымдардың зерттеулері бойынша топырақты биокөмірмен немесе органикалық заттармен тыңайтқан жағдайларда өнімділік 800 %-ға дейін артқандығы ғылыми әдебиеттерде кездеседі [9]. Бүгінгі таңда биокөмірді ауылшарашылығына биотыңатқыш ретінде енгізу атмосферадағы көміртегін өзіне сіңіріп, топырақтың физикалық, химиялық, биологиялық, физика-химиялық қасиеттерін жақсартып, тұрақтылығын сақтап қалуымен қатар, топырақтағы парниктік газдардың мөлшерін азайтады [12-14].

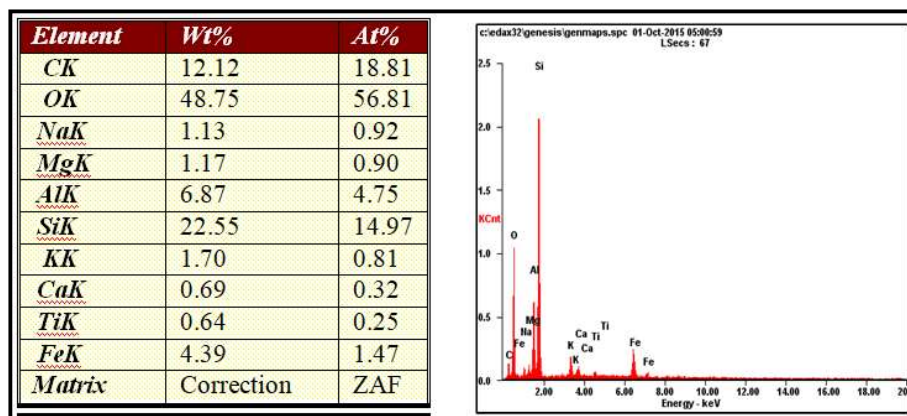
Биокөмірдің кейбір түрлері топырақ құрамын жақсартады және өсімдік біртіндеп пайдалануы үшін тыңайтқыштарды ұстап қалу және оның байланысу қабілетін арттырады. Биокөмір құрамында өсімдікке қажетті микроэлементтер көп және жоғары температурада зарарсыздандыру жүргізілген көң немесе органикалық қалдықтар сияқты табиғи тыңайтқыштарға қарағанда қауіпсіз болып табылады. Микроэлементтерді өсімдіктер баяу пайдаланатындықтан жер асты ыза суларының ластануына әсер етпейді. Биокөмір топырақтың химиялық, биологиялық және физикалық қасиеттерін жақсарту есебінен топырақ құнарлылығын аттыруға қабілетті екенін зерттеулер көрсетті. Биокөмір енгізілген топырақтарда өсімдіктердің өсуі артып және қоректік жағдайы жақсарады, азот тыңайтқыштарының тиімділігі артады. Жоғарда мазмұндалғандарға қарамастан биокөмірді зерттеу әлі де жалғасуда, және де өте маңызды мәселелерге әлі де жауап жоқ. Сондықтан биокөмірді зерттеу әлі де әлем бойынша жалғастырылуда. Шетелдік авторлардың жұмыстарында биокөмірдің топырақ жағдайын жақсартатын қасиеті кең түрде зерттелген, әсіресе, биокөмір топырақ құрылымын жақсартып, топырақтың табиғи құнарлылығын арттырады [15. 16].

Биокөмір топырақта мекендейтін микроорганизмдер үшін қолайлы қоректік орта болып табылады. Топырақта тіршілік ететін микроорганизмдер биохимиялық үрдістерге қатысып, өсімдік қалдықтарының ыдырауына, басқада заттардың минерализациялануына мүмкіндік тудырады. Биокөмір өсімдіктерді ұлы химиялық элементтерден қорғайды.

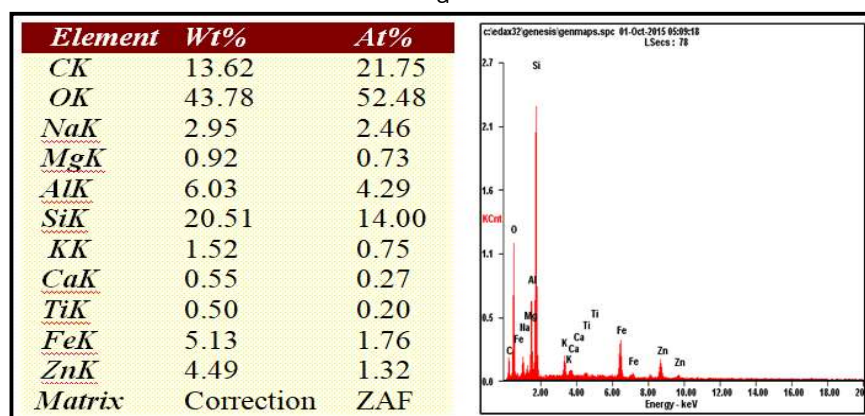
Ғалымдардың зерттеулері бойынша топырақты биокөмірмен немесе органикалық заттармен тыңайтқан жағдайларда өнімділік 800 %-ға дейін артқандығы ғылыми әдебиеттерде кездеседі [17]. Бүгінгі таңда биокөмірді ауылшарашылығына биотыңатқыш ретінде енгізу атмосферадағы көміртегін өзіне сіңіріп, топырақтың физикалық, химиялық, биологиялық, физика-химиялық қасиеттерін жақсартып, тұрақтылығын сақтап қалуымен қатар, топырақтағы парниктік газдардың мөлшерін азайтады [18-22].

Биокөмірге қызығушылықтың артуы экологиялық проблемалардың, соның ішінде климаттың өзгеруі және жылыжайлық әсердің артуы, топырақ құнарлылығының төмендеуі нәтижесінде туындаған. Топырақ құнарлылығын арттыру үшін биокөмір маңызды элемент болып табылады. Биокөмір өзіндік қасиеттерінің арқасында гумус және қоректік элементтер жетіспейтін топырақтардың сапасын жақсарту үшін ауыл шаруашылығында қолдануға арналған маңызды мелиорант болып табылады. Күріш қабығының қалдығы топырақ құнарлылығын арттыруға арналған жоғары сапалы органикалық затқа қайта өңделеді. Биокөмірдің қуыстылығының жоғары болуы (сорбент) оның өзіндік қасиеттерімен бірге топырақты ылғал мен қоректік элементтердің ұсталып қалуына жағдай жасайды. Зертханалық тәжірибе және ауыл шаруашылығына тікелей қолдану суды аз тұтыну жағдайында дақылдардың өсуінің елеулі артқанын көрсетті. Биокөмірді топыраққа енгізу биологиялық үрдістерді жақсартып, топырақ құнарлылығын арттырады. Ауыл шаруашылық және экономикалық параметрлерді жақсартумен қатар биокөмір топырақта CO_2 сақталуы үшін тиімді және қарапайым құрал болып табылады. Биокөмірдің кейбір түрлері топырақ құрамын жақсартады және өсімдік біртіндеп пайдалануы үшін тыңайтқыштарды ұстап қалу және оның байланысу қабілетін арттырады. Биокөмір құрамында өсімдікке қажетті микроэлементтер көп және жоғары температурада зарарсыздандыру жүргізілген көң немесе органикалық қалдықтар сияқты табиғи тыңайтқыштарға қарағанда қауіпсіз болып табылады. Микроэлементтерді өсімдіктер баяу пайдаланатындықтан жер асты ыза суларының ластануына әсер етпейді. Биокөмір топырақтың химиялық, биологиялық және физикалық қасиеттерін жақсарту есебінен топырақ құнарлылығын арттыруға қабілетті екенін зерттеулер көрсетті. Биокөмір енгізілген топырақтарда өсімдіктердің өсуі артып және қоректік жағдайы жақсарады, азот тыңайтқыштарының тиімділігі артады. Жоғарда мазмұндалғандарға қарамастан биокөмірді зерттеу әлі де жалғасуда, және де өте маңызды мәселелерге әлі де жауап жоқ. Сондықтан биокөмірді зерттеу әлі де бүкіл әлем бойынша жалғастырылуда.

Күріш қабығы негізіндегі биокөмірді зерттеумен карбонизациялау жолымен көбірек меншікті беті мен кеуектілігі бар неғұрлым дамыған құрылым алуға болатыны анықталды, бұл оның сорбциялық қасиеттерін арттырады. Ө.Оспанов атындағы Қазақ топырақтану және агрохимия ғылыми зерттеу институтының Топырақ экологиясы бөлімінің ғалымдарының зерттеулері бойынша мырыш зауытының шығарындыларымен ластанған топырақты электрондық-микроскопиялық зерттеулер мен спектралдық талдау бақылау нұсқасында мырыш жоқ екенін, ал биокөмір нұсқасында элементтік құрамда мырыш бар екенін көрсетті (2 а, б суреттер). Мәселен, спектрлік талдау биокөмірдің сіңіру қасиеттерін көрсетті.



a



б

2-сурет - Тәжірибе нұсқалары бойынша топырақты спектралдық талдау:
а) биокөмір енгізілмеген бақылау; б) биокөмір енгізілген нұсқасы

Мәселен, спектрлік талдау биокөмірдің сіңіру қасиеттерін көрсетті. Ө.Оспанов атындағы Қазақ топырақтану және агрохимия ғылыми зерттеу институтының Топырақ экологиясы бөлімінің қызметкерлерінің ластанған топырақты мырыш зауытының шығарындыларымен оңалту жөніндегі тәжірибе нұсқаларында ауыр металдардың сорбциясын (Zn, Pb) анықтау мақсатында, Джеол (Жапония) фирмасының 733 Суперсынамаларының электрондық-зондтық микроанализаторында биотүрмен бақыланатын және нұсқасы бар топырақтың электрондық микроанализі орындалды. Электрондық микроанализ нәтижелері тек сорбцияланған мырышты көрсетті, бірақ қорғасынның сорбциясы табылған жоқ. Бәлкім, бұл биокөмір алу пиролизінің температурасымен түсіндірілуі мүмкін.

Осылайша, ластанған топырақтың спектрлік және электронды-микроскопиялық талдаулары мырыш элементінің биокөмір сорбциясы туралы көрсетті.

Жоғарыда баяндалған материалдан ауыр металдардың сорбенті ретінде күріш қабығынан алынған биокөмірді сынау республиканың өнеркәсіптік өңірлерінде қалпына келтіру тәсілдерін әзірлеудің теориялық негізі болып табылады. Зерттеулер осы жағдайларда 650 °C-да алынған биокөмірді пайдалану қажеттігін анықтады.

Міне, осы күріш қауызынан пиролиз әдісімен алынған биокөмірді фосфор зауытының шығарындыларымен ластанған топырақтарға да пайдалануға болатынына көз жеткіздік. Біздің әріптестеріміздің тәжірибелік зерттеулеріне тоқтала келе біздің мынадай ұсыныстарымыз бар:

Елімізде күріш қабығынан биокөмір өндіретін зауыт салуды ұсынамыз. Ол ауыл шаруашылығының қайта өңдеу салаларының экологиялық проблемаларын шешеді және топырақта биокөмірді пайдалану үшін биокөмірдің құнын төмендетеді.

1. Биокөмір топырақтың құнарлылығын сақтауда, ластанған топырақты тазалауда үлкен әсері бар тамаша сорбент, перспективалы табиғи мелиорант болып табылады.

2. Биокөмір тыңайтқыштарды пайдалану қажеттілігін едәуір төмендете отырып, топырақта азот, фосфор, кальций және күкірт сияқты қоректік элементтерді, ылғалды сіңіріп, ұстап тұрады.

3. Топырақта өмір сүретін және өсімдіктердің қоректенуі мен өсуі үшін құнарлылық элементтерін босатып, биохимиялық үрдістерге қатысатын микробтардың тіршілік ету ортасы болып табылады.

4. Биокөмір топырақтағы рН деңгейін көтеруге ықпал етіп, оны қышқыл және сілтілі етеді.

5. Биокөмір экологиялық қауіпсіз және топырақтың белгілі бір түріне енгізу кезінде көміртекті сақтауға және топырақтың агрохимиялық сипаттамаларын жақсартуға мүмкіндік береді, сондай-ақ қоршаған ортаға, адам мен жануарлардың денсаулығына уақытша да, ұзақ мерзімді де қолайсыз әсерді болдырмауға мүмкіндік береді. Биокөмірді тікелей ризосфераға енгізу өнімділікті жақсартады және эрозияны азайтады деп болжануда.

6. Биокөмірде өсімдіктерге қажетті көптеген микроэлементтер бар және қи немесе жоғары температуралық дезинфекциядан өткен органикалық қалдықтар сияқты басқа «табиғи» тыңайтқыштарға қарағанда неғұрлым қауіпсіз болып табылады. Микроэлементтер өсімдіктермен баяу пайдаланылатындықтан, биокөмір жер асты суларының ластану қаупін аз жасырады.

7. Биокөмір сорбент болып табылады және топырақ ортасында аз жылжымалы және аз еритін кешенді органикалық-минералдық қосылыстарды құрайды. Бұл үдеріс өсімдік органдарына ауыр металдардың түсуіне кедергі болып табылады. Биокөмірдің жерсінуіне, вегетациялық даму сипатына және отырғызылған өсімдіктердің сыртқы жағымсыз факторлар кешеніне жалпы тұрақтылығын арттыратын морфобиологиялық көрсеткіштеріне таңдаулы әсері атап өтілді. Күріш қабығынан жасалған карбонизацияланған биокөмірдің сорбциялық кедергісі өсімдіктердің өсіп-өнуіне оң әсер ететіндігіне ғылыми тәжірибелердің арқасында аңқалды.

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ҚАРАТАЛ ӨЗЕНІ ЖАҒАЛАУЫНЫҢ БИОТАСЫНЫҢ ЕРЕКШЕЛІГІ

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Түйіндеме

Қазіргі уақытта Жердің барлық су объектілері өнеркәсіп, ауыл шаруашылығы және коммуналдық-тұрмыстық шаруашылық үшін су тұтыну көздері ғана емес, сонымен қатар қалалар мен экономиканың түрлі салаларындағы пайдаланылған сарқынды суларды ағызу орны болып табылады. Осыған байланысты үлкен және кіші өзендер кең таралған және адамның жайлы өмір сүруі үшін маңызды, сол себепті Қаратал өзені биотасының ерекшелігін зерттеудің қажеттілігі мен маңыздылығы туындайды.

Кілт сөздер: Қаратал өзені, биота, ауыр металлдар, мұздықтар, экожүйе

Аннотация

В настоящее время все водные объекты Земли являются не только источниками водопотребления для промышленности, сельского хозяйства и коммунально-бытового хозяйства, но и местом сброса отработанных сточных вод в городах и различных отраслях экономики. В связи с этим большие и малые реки широко распространены и важны для комфортного проживания человека, поэтому возникает необходимость и важность изучения специфики биоты реки Каратал.

Ключевые слова: Река Каратал, биота, тяжелые металлы, ледники, экосистема.

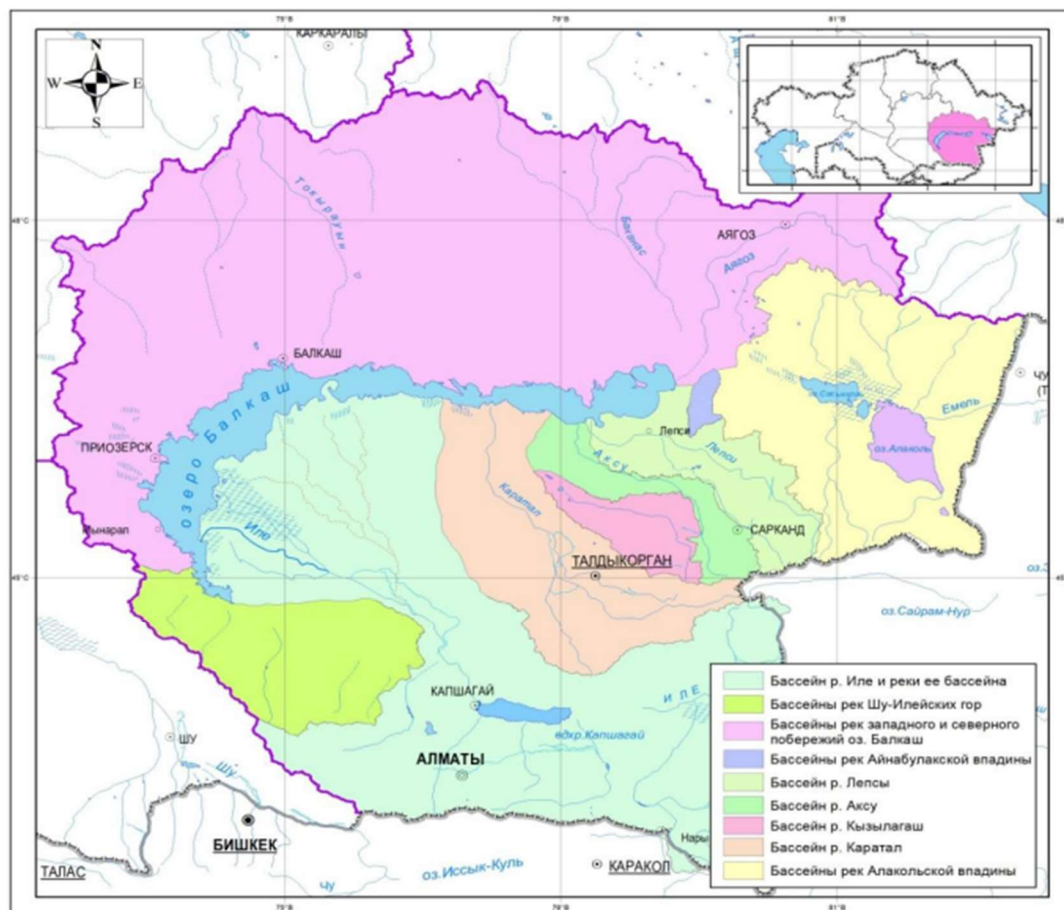
Annotation

Currently, all water bodies on Earth are not only sources of water consumption for industry, agriculture and public utilities, but also a place of discharge of wastewater in cities and various sectors of the economy. In this regard, large and small rivers are widespread and important for a comfortable human stay, therefore it becomes necessary and important to study the specifics of the Karatal River biota.

Keywords: Karatal River, biota, heavy metals, glaciers, ecosystem

Қаратал - Қазақстанның Жетісу облысындағы өзен, Ескелді және Қаратал аудандарының аумағы бойынша ағып өтеді және оның ұзындығы 390 км, бассейнінің ауданы 19,1 мың км² құрайды [1]. Өзен арнасы бастауынан сағасына біртіндеп 10–20-дан 50–100 м-ге дейін кеңейеді. Таулардағы ағынның жылдамдығы шамамен 2 м/с құрайды, жазықта ол екі есе азаяды. Ол Орталық Жетісу Алатауы жотасының солтүстік-батыс беткейлерінен бастау алады. Оның сулары Тронова мұздық кешенінен бастау алады және оның негізгі салалары- Қара, Көксу, Теректі және тағы басқалары Балқаш көліне құяды.

Қаратал бассейнінің жергілікті халық шаруашылығының дамуы табиғи ландшафттардың ресурстық әлеуетінің үдемелі тартылуымен және дамуымен сипатталады, оны пайдаланудың қазіргі қарқыны табиғи ортаға антропогендік әсерді едәуір күшейтеді (Сурет-1). Табиғи ландшафттардың экологиялық ортасының қалыптасуына ауылдық және су шаруашылығы салалары, сондай-ақ өңдеу және тау-кен өндірумен байланысты өндірістік объектілер айтарлықтай әсер етеді.



Сурет-1. Жетісу облысы су бассейндерінің картасы

Биота-қазіргі немесе өткен геологиялық дәуірлерде ортақ тіршілік ету ортасымен (таралуымен) біріктірілген тірі организмдер түрлерінің тарихи қалыптасқан жиынтығы. Биотаның құрамына жасушалық организмдердің өкілдері (өсімдіктер, жануарлар, саңырауқұлақтар, бактериялар) және жасушасыз организмдер (мысалы, вирустар) кіреді [2].

Бүгінгі таңда мұздықтардың еруінен туындаған ауыр металдардың бөлінуіне және оның мұздықтармен қоректенетін экожүйелерге ықтимал әсеріне қатысты алаңдаушылық күшейе түсті. Бұл өзеннің суында кездесетін басым иондар-бикарбонат және кальций иондары. Талдықорған қаласынан жоғары су сапасының деңгейі ластанған деп сипатталады. Балықтардың құрамындағы металдардың концентрациясын анықтау табиғатты қорғауға да, адам тұтынуына да қатысты маңызды пән болып табылады. Ластаушы заттар балыққа азық арқылы, желбезек арқылы және суды тұтыну арқылы енеді. Ластаушы заттар қан арқылы тасымалданады, бауырда және май тіндерінде сақталады. Желбезек немесе бүйрек арқылы шығарылып, бұлшықетте сақталады. Кейбір металлдар ластаушы заттар болып балық үшін өте улы.

Биология ғылымдарының дамуымен соңғы жылдары биоталарды зерттеуге ерекше назар аударылды, соның ішінде - балдырлар ерекше назар аударуды қажет етеді. Балдырлар ағынды суларды биологиялық тазартуға қатысады, топырақ пен су объектілерінің өнімділігін арттырады және азық-түлік, мал азығы, емдік шикізат аминқышқылдары, витаминдер және т. б. өндіру үшін кеңінен қолданылады.

Бүгінгі таңда жекелеген аймақтардағы балдырлардың түрлік және жүйелі әртүрлілігін мақсатты түрде зерттеу жұмыстары өте аз. Материалдарды жинауға Жетісу облысының зерттелетін аудандарының әртүрлі су айдындары мен су ағындарынан жүргізілді. Экспедициялық сапарлар ұйымдастырылды. Балдырлардың әртүрлі экологиялық топтары (планктоникалық, бентикалық) арнайы әдістер мен құралдарды қолдану арқылы жиналады.

2022 жылы Кербұлақ, Көксу, Ескелді, Сарқан, Ақсу, Алакөл аудандарынан су айдындары мен су ағындарын зерттеу кезінде 5 бөлімнің 441 түрі, 11 классы, 23 қатар, 44 түрі, 76 түрі анықталды. Сол кезде *Cyanoprokaryota*, *Chlorophyta*, *Charophyta*, *Bacillariophyta*, *Euglenophyta*, *Dinophyta*, *Xantophyta*, *Chrysophyta* түрлері анықталған. Бұл өзеннің альгофлорасының негізін диатомды балдырлар (*Bacillariophyta*) құрайды [3].

Балдырлар өзендер, тоғандар мен көлдерді қоса алғанда, тұщы су экожүйелерінің маңызды бөлігі. Олар су объектілердің құрамын қалыпта ұстауда шешуші рөл атқарады, бірақ кейде олардың шамадан тыс өсуі мәселе тудыруы мүмкін. Балдырлар табиғи сүзгілер қызметін атқарады. Олар көмірқышқыл газын сіңіріп, оттегін шығарады, бұл судың сапасын жақсартуға көмектеседі. Балдырлар көптеген су организмдеріне азық ретінде де қызмет етеді. Мысалы, кейбір балық түрлері балдырлармен қоректеніп, олардың мөлшерін бақылауға көмектеседі. Балдырлар азот, фосфор және калий сияқты қоректік заттарды қайта бөлуге белсенді қатысады. Олар бұл заттарды сіңіреді, олардың суда шамадан тыс жиналуын болдырмайды және экожүйенің тұрақтылығын сақтауға көмектеседі. Балдырлар судың химиялық құрамына, әсіресе рН деңгейіне және тұздылыққа әсер ете алады.

Балдырлар, әртүрлі су өсімдіктері бар жерлерде, микроорганизмдердің, омыртқасыздардың және балықтардың көптеген түрлерінің өмір сүруіне қолайлы жағдай жасайды. Балдырлардың алуан түрлілігі өзен экожүйесінің биоәртүрлілігін сақтауда қызмет етеді.

Балдырлар суға түскен күн сәулесінің бір бөлігін сіңіріп, судың температурасының тұрақтылығын қамтамасыз етеді. Олар суда өсіп, өздерінің көпжасушалы құрылымдарымен су бетінде көлеңке қалыптастырып, судың температурасын реттеуге көмектеседі.

Материал және әдістер

Жетісу облысы Талдықорған қаласының Қаратал өзені жағалауының биотасында зерттеу жұмысы жүргізілді (Сурет-2).



Сурет-2. Қазақстан, Талдықорған қаласы, Қаратал өзенінен балық сынамаларын жинау орны

Барлығы 35 *Triplophysa stoichkai* түрі, екі пелагиялық түрдің 13 үлгісі жиналды (Арал бассейнінің қарлы форелының тоғыз түрі *Schizthorax intermedius* және жалаңаш Османның төрт түрі *Gymnodiptychus dybowskii*). Барлық табылған материалдар өлі күйінде табылды, олардың барлығы жас, ұзындығы 6-дан 11 см-ге дейін болды. Алынған үлгілер таңбаланған полиэтилен пакеттерде сақталды, содан кейін кептірілді (Сурет-3). Зерттеу жұмысының объектілерін зерттеу институттарына жіберуге дайындалды.



Сурет-3. Қаратал өзені жағалауында табылған *Triplophysa stoichkai*

Мұздықтар динамикасы мен ластаушы заттардың айналымы арасындағы байланыс жалпы биота үшін күрделі тақырып болып табылады және мұздық өзендеріндегі балықтардың әртүрлі экологиялық топтарына химиялық заттардың синергетикалық әсері жеткілікті зерттелмеген зерттеу саласы болып табылады. Потенциалды улы элементтер әдетте балықтардың өміріне өздігінен емес, синергетикалық түрде, қосылыстарда әсер етеді, балықтың денесінде бір-бірінің әсерін тежейді немесе жеделдетеді.

Қорытынды

Балдырлар өзен экожүйелерінде баға жетпес маңызды биологиялық рөл атқарады. Олар фотосинтез, метаболизм, фильтрация және биоәртүрлілікті сақтау сияқты негізгі экожүйелік процестерді қолдайды. Жалпы су экожүйесінің тұрақтылығы мен индикаторлық деңгейі балдырлардың жағдайына байланысты. Сондықтан су объектілерінің ластануын азайту және балық аулау мен балық тұтынудың қатаң қауіпсіздік стандарттарын сақтау бойынша жұмысты жалғастыру маңызды. Балықта жиналатын ауыр металдар экожүйелер мен адам денсаулығына үлкен қауіп төндіруі мүмкін.

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3. ОШ МАМЛЕКЕТТИК УНИВЕРСИТЕТИНИН ЖАРЧЫСЫ. ХИМИЯ. БИОЛОГИЯ. ГЕОГРАФИЯ ВЕСТНИК ОШСКОГО ГОСУДАРСТВЕННОГО УНИВЕРСИТЕТА. ХИМИЯ. БИОЛОГИЯ. ГЕОГРАФИЯ JOURNAL OF OSH STATE UNIVERSITY. CHEMISTRY. BIOLOGY. GEOGRAPHY e-ISSN: 1694–8688 №1(4)/2024, 138-147р БИОЛОГИЯ УДК: 582.26 (574.52) DOI: 10.52754/16948688 2024 1(4) 18 ФЛОРА ВОДОРΟΣЛЕЙ ВОДОЕМОВ АЛМАТИНСКОЙ ОБЛАСТИ
4. DIFFERENCES IN THE SYNERGIC ACCUMULATION OF TOXIC ELEMENTS IN PELAGIC AND BENTHIC FISH FROM GLACIER-FED RIVERS OF THE DZUNGARIAN ALATAU MARIÁN JANIGA¹, MARTIN JANIGA¹, SAMUEL BRECELJ¹, SAMUEL FEJEŠ¹, AIBEK ABDUAKASOV², BERIKZHAN OXIKBAYEV², MARTINA HAAS

Psychological Sciences

Psixi inkişafında ləngimələr olan uşaqların psixoloji xarakteristikası

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Xülasə:

Psixi inkişaf ləngiməsi dövrümüzün ən aktual problemlərindəndir. Psixi inkişaf ləngiməsi (PİL) bir çox fərziyyələrə əsasən psixi-fiziki və yaxud psixi infantilizm adlandırılır. "İnfantalizm" dedikdə, emosional iradi sferanın və intellektual sferanın yaş həddindən aşağı olması nəzərdə tutulur. Psixi inkişaf ləngiməsi diaqnozu məktəbəqədər və daha azyaşlı uşaqlara qoyulur. Əgər psixi inkişaf ləngiməsinin təzahürləri yuxarı yaş dövrlərində özünü göstərsə, bu oligofreniyanın mövcudluğunu göstərir.

Summary:

Mental developmental delay is one of the most pressing problems of our time. Mental developmental delay (MDD) is called psycho-physical or mental infantilism, according to many hypotheses. "Infantilism" means that the emotional-volitional sphere and the intellectual sphere are below the age limit. Mental developmental delay is diagnosed in preschool and younger children. If the manifestations of mental developmental delay manifest themselves in older age periods, this indicates the presence of oligophrenia.

Açar sözlər:

Psixi inkişaf ləngiməsi, idrak prosesləri, duyğu, qavrayış, diqqət, hafizə, təfəkkür, təxəyyül, nitq, aparıcı fəaliyyət növləri, emosional sfera, məktəb təlimi.

Keywords:

Mental retardation, cognitive processes, emotion, perception, attention, memory, thinking, imagination, speech, leading types of activity, emotional sphere, school education.

PİL-in ilk əlamətləri 0-3 yaş dövründə müxtəlif ziyanlara qarşı somatovegetativ reaksiyalar formasında üzə çıxı bilər. Belə reaksiyalar üçün yuxu, iştaha, mədə-bağırsaq pozulmaları ilə xarakterizə olunan ümumi və vegetativ həyəcan xasdır. Burada həmçinin, qusma, bədən temperaturunun təəddüdü, iştahanın olmaması, qarının şişkinliyi, tərləmə və s. iştirak edə bilər. Bu cür reaksiya somatovegetativ yetişənliyin nəticəsi olaraq konkret yaş dövründə aparıcı olur.

4-10 yaşlarında reaksiyanın psixomotor səviyyəsi xarakterikdir. Buraya əsasən müxtəlif mənşəli hiperdinamik pozulmalar daxildir: psixomotor qıcıqlanma, kəkələmə. Patoloji reaksiyanın bu səviyyəsi hərəkəti analizatorun yarımkürələr şöbələrinin intensiv differensiasiyası ilə bağlıdır. PİL uşaqlar əksər hallarda kiçik boya və çəkiyə malikdirlər. Fiziki xüsusiyyətlərinə görə daha kiçik yaş dövründəki uşaqları xatırladırlar. Hadisələrin 40 %-də patoloji işarələr mövcud olmur və yaxud yüngül nevroloji pozulmalar müşahidə olunur. Motorika əksər hallarda kifayət qədərdir, hərəkətlər koordinasiə olunmuş, dəqiq və cəld olur. Uşaqlar oyun situasiyalarında təəvvür etdikləri hərəkətləri yerinə yetirə bilirlər. Lakin daha mürəkkəb ixtiyari hərəkətlər inkişafdan qalır.

Yüngül formalı PİL idrak fəaliyyətinin ilkin pozulmaları ilə fərqlənir, ayrı-ayrı qabıqaltı funksiyalar qüsurlu olur. Ümumiyyətlə, PİL hər hansı bir sistemin yetişmə tempinin pozulması ilə xarakterizə edilir. Alın payının yetişmə tempinin və onun digər qabıqaltı şöbələrlə əlaqələrinin ləngiməsi mümkündür. Alın payının yetişmə tempinin ləngiməsinin əlamətləri tənqidiliyin aşağı düşməsi, situasiyanın vacib əlamətlərinin nəzərə alınmaması, laqeydlilik, motorikanın

inkişafdanqalması və s. ola bilər. Adətən, göstərilən əlamətlər müvəqqəti və geriye dönən xarakterdədir.

PİL uşaqların diqqəti davamsız, tərəddüdə meyilli olur. Bu və ya digər fəaliyyət müddətində uşaqların diqqətini toplamaq və mərkəzləşdirmək çətinlik yaradır. Fəaliyyətin məqsədyönlü icrası kifayət etmir, uşaqlar əksər hallarda impulsiv fəaliyyət göstərir və yayınırlar. Kiçik məktəb yaş dövründə PİL uşaqların 69 %-də yayınmalar normadan çoxdur. Oliqofreniya zamanı norma və PİL ilə müqayisədə daha yüksək yayınma müşahidə edilir. Həmçinin ətalətlilik müşahidə olunur. Bu halda uşaq bir tapşırıqdan digərinə çətinliklə keçir.

Bu cür uşaqların əksəriyyətində diqqətin həcmi məhduddur, fragmentar xarakterlidir. Uşaq ona təqdim edilən informasiyanın ancaq ayrı-ayrı hissələrini qavraya bilir. Diqqətin belə pozulması anlayışların formalaşması prosesini ləngidə bilər.

1987-ci ildə Amerika Psixiatrlar Assosiasiyası diqqət pozulmalarının aşağıdakı əlamətlərə əsasən erkən diaqnostikasının meyarlarını müəyyən etmişdir:

- Həddən artıq hərəkət aktivlik: uşaq ayaqları, əlləri ilə çoxlu hərəkətlər edir, yerində fırlanır;
- Yaşının təlimatı ilə uzun müddət sakit otura bilmir;
- Xarici stimullarla asanlıqla tarazlıqdan çıxır;
- Səbrsizdir, həmyaşıdları ilə oyunlar zamanı tez həyəcanlanır, oyunda öz növbəsini gözləyə bilmir;
- Sualı sona qədər dinləmədən cavab verməyə başlayır;
- Oyun tapşırıqlarını yerinə yetirən zaman diqqətini çətinliklə saxlayır;
- Sakit şəkildə danışa və oynaya bilmir;
- Tez-tez digərlərinin sözünü kəsir və başqa uşaqların oyununa müdaxilə edir.

PİL uşaqların diqqətinin davamlılığının aşağı olması müxtəlif xarakterli ola bilər: tapşırığın həllinin başlanğıcında diqqətin maksimum gərginliyi və onun sonrakı enişi; işin müxtəlif mərhələlərində diqqətin mərkəzləşməsi; iş müddətində mərhələlərlə diqqətin gah gərginləşməsi, gah da azalması.[1. S.67]

Tədqiqatlara əsasən, PİL uşaqların təlimi zamanı öyrənilənlərin çoxsaylı təkrarına xüsusi diqqət göstərmək lazımdır. Eyni informasiyanın rəngarəng üsullarla verilməsinə çalışmaq lazımdır. Yeni informasiyaya diqqəti cəlb edən və onun davamlılığını artıran istənilən metodik priyomların istifadəsi vacibdir. Uşağın ontogenezdə qavradığı informasiyanın ümumi miqdarının xüsusilə senzitiv dövrlərdə artırılması böyük əhəmiyyət kəsb edir. İnkişafın erkən mərhələlərində görmə, eşitmə və dəri analizatorları vasitəsilə daxil olan informasiyanın miqdarının artması differensial qavrayışın əsasında dayanır.

PİL uşaqlarda perseptiv əməliyyatların yerinə yetirilmə sürəti aşağıdır. Xüsusilə mürəkkəb şəraitdə informasiyanın qəbulu və emalı üçün çoxlu vaxt tələb olunur. Normal inkişaf səviyyəsinə malik olan uşaqlar nağıllara canlı maraq göstərir, təcrübə qurtardıqdan sonra sona qədər qulaq asmağı arzulayırlar. PİL uşaqlar isə daha passivdir, nağıla maraq göstərmirlər. Əqli geriliyi olan uşaqlarda da nağıla qarşı maraq olmur, hətta onlardan biri nağıl səsləndirilən maqnitofonu söndürməyi tələb edirdi. Tədqiqatçılar qeyd edir ki, əqli geriliyi olan şagirdlərdən ikisi eksperimentin sonuna yaxın ümumiyyətlə sensor siqnalara reaksiya vermirdilər. Beləliklə, emosional fonlu nitq fəaliyyətində PİL uşaqlarda reaksiyanın müddəti ləngiyir, təlimata əsasən tapşırıqların yerinə yetirilmə dəqiqliyi aşağı düşür, səhv reaksiyaların miqdarı artır. Deməli fəaliyyət prosesində qavrayışın sürəti və seçiciliyi azalır. Əldə edilmiş məlumatlar göstərir ki, anomaliya zamanı qavrayışın ləngiməsinin səbəblərindən biri diqqətin seçiciliyinin pozulmasıdır.

PİL uşaqların tədqiqatçılıq fəaliyyəti norma ilə müqayisədə daha aşağıdır: uşaqlar əşyaları araşdırma bilmir, ifadə edilmiş aktivliyə malik deyillər, uzun müddət əşyaların keyfiyyətlərini öyrənərkən praktiki üsullara üstünlük verirlər. Əqli geriliyi olan uşaqlardan fərqli olaraq, məktəbəqədər yaşlı PİL uşaqlar əşyaların keyfiyyətlərini praktiki şəkildə fərqləndirməkdə çətinlik çəkmirlər, lakin onların sensor təcrübəsi uzun müddət söz vasitəsilə möhkəmlənmir və

ümumiləşmir. Ona görə də uşaq “qırmızı qələmi ver” təlimatını düzgün yerinə yetirə bildiyi halda, göstərilmiş qələmin rəngini müstəqil şəkildə deməkdə çətinlik çəkir.

M.S.Pevzner inkişaf tempinin pozulduğu uşaqlarda görmə qavrayışını araşdırmışdır. 140 nəfər sınağa cəlb edilən uşaqdan ancaq 30 nəfərində tərsinə çevrilmiş fiqurların qavranılması zamanı yüngül çətinliklər aşkar edilmişdir. 140 nəfərin ancaq 20-də ayrı-ayrı tapşırıqların yerinə yetirilməsində məkan qavrayışının çətinliyi görünür.

PİL uşaqlar xüsuskəmiyyət təsəvvürlərinə yiyələnən zaman çətinlik çəkir, kəmiyyətin ayrı-ayrı parametrlərini (uzunluq, en, hündürlük, qalınlıq) göstərmirlər. Təhlil prosesi çətinliklə qarşılaşır: uşaqlar əsas struktur elementlərini, onun məkan əlaqəsini, kiçik detalları ayırd etməyi bacarmırlar. Əşyaların oxşar keyfiyyətləri tez-tez eyni keyfiyyətlər kimi qavranılır. Burada əşyanın tam obrazının formalaşma tempinin ləngiməsi haqqında danışmaq olar.

Eşitmə qavrayışı cəhətdən kobud çatışmazlıqlar müşahidə olunmur. Uşaqlar qeyri-nitq səslərinə istiqamətlənmə zamanı bəzi çətinliklər çəkə bilirlər, lakin əsasən fonematik proseslər zədələnir. Belə uşaqlarda tez-tez görmə və eşitmə qavrayışının incə formalarının natamamlığı görünür. Göstərilən çatışmazlıqlar həm də taktil-hərəkəti qavrayışa da aiddir. Əşyaların toxunaraq tanınması prosesi çətinləşir. Mürəkkəb fəaliyyət növlərinin əsasında dayanan analizatorlararası əlaqələrin formalaşması prosesi ləngiyir. Görmə-motor, eşitmə-görmə-motor koordinasiya çatışmazlıqlar mövcuddur. Sonralar bu çatışmazlıqlar oxu və yazının mənimsənilməsini çətinləşdirir.

PİL uşaqlarda göstərilən spesifik qavrayış pozulmaları onların ətraf gerçəklik haqqında təsəvvürlərinin məhdudluğunu və fraqmentarlığını müəyyənləşdirir. Belə uşaqların başlıca xüsusiyyətlərindən biri də ayrı-ayrı perseptiv və hərəkəti funksiyalar arasındakı əlaqələrin kifayət qədər olmamasındadır.[2. s. 89]

PİL uşaqların hafizəsi özünəməxsus keyfiyyəti ilə fərqlənir. İlk növbədə uşaqlarda hafizənin həcmi məhduddur və yaddasxlamanın möhkəmliyi azdır. Yaddasalma zamanı qeyri-dəqiqlik və informasiyanın tez unudulması xarakterikdir. Dah çox verbal hafizə zədələnir. Təlimə düzgün yanaşma olarsa, uşaqlar bəzi mnemotexniki priyomlara və məntiqi yaddasxlama üsullarına yiyələnə bilirlər.

Tədqiqatçılar PİL uşaqların kompleks psixoloji-pedaqoji və neyropsixoloji tədqiqi nəticəsində aşağıdakı tendensiyaları müəyyən etmişlər: yaddasxlanılan əşyaların miqdarı azdır, “öyrənmə əyrisi” sağlam uşaqlara nisbətə 3 dəfə az normaya uyğundur. Öyrənmə əyrisi yaddasxlamanın səmərəliliyinin təkrarın miqdarından asılılığını göstərir. Norma çərçivəsində ancaq birbaşa asılılıqdır – təkrar nə qədər çoxdursa, nəticə o qədər yaxşıdır. Öyrənmə əyrisinin rigid tipi yaddasxlamanın çox ləng gedişini göstərir. Nəticə əldə etmək üçün çoxlu sayda təkrara ehtiyac yaranır. “Təqətdən salan” öyrənmə tipi əksinə asılılığı göstərir: təkrar nə qədər çoxdursa, nəticə bir o qədər pisdır. “Yayla” tipli öyrənmə əyrisi adətən əqli cəhətdən geri qalan uşaqlara xasdır və yaddasxlamanın müvəffəqiyyətinin təkrarın miqdarından asılı olmadığını göstərir. Bu tip demək olar ki, düzxətt kimi göstərilir. Qeyd edilir ki, PİL uşaqların demək olar ki, yarısından çoxunda öyrənmə əyrisi rigid tipə, beşdən birində isə “təqətdən salan” tipə uyğundur.

Tədqiqatçılar PİL uşaqların mnemik fəaliyyətinin aşağıdakı xüsusiyyətlərini göstərilir:

- Maneələrin təsiri nəticəsində mnemik izlərin yüksək ləngliyi;
- Hafizənin həcmnin az olması;
- Yaddasxlamanın sürətinin azlığı;
- Mexaniki yaddasxlamanın ilk cəhdlərində məhsuldarlığın aşağı olması;
- Normadan fərqli olaraq, qeyri-ixtiyari yaddasxlamanın məhsuldarlığının aşağı olması;
- Xüsusi yaddasxlama priyomlarının istifadə edilməsi bacarıqlarının kifayət qədər olmaması;
- IV sinfə qədər PİL uşaqlar əsasən mexaniki yaddasxlamadan istifadə edirlər.

PİL uşaqların başlıca çətinlikləri intellektual priyomlardan məhsuldar şəkildə istifadə edə bilməməlidir.

PİL uşaqlarda idraki fəaliyyətin inkişafında ləngimə artıq təfəkkürün əyani formaları səviyyəsində qeyd edilir. Tədqiqatçılar hissələrdən tamın yaradılmasında və tamdan hissələrin ayırd edilməsində çətinlikləri göstərir. Eyni zamanda obrazlarla məkan əməliyyatları çətinləşir. Məsələn, həndəsi fiqur və naxışların seçilməsi zamanı bu uşaqlar formanı tam şəkildə təhlil etməyi, simmetriklili müəyyənləşdirməyi, hissələri tam şəkildə birləşdirməyi bacarmırlar. Lakin, əqli geriliyi olan uşaqlardan fərqli olaraq, sadə naxışlarla əməliyyatları düzgün yerinə yetirirlər. Əyani nümunələr verilməyən tapşırıqlar onlar üçün çətinlik yaradır. PİL uşaqların 25 %-də əyani-əməli tapşırıqların həlli systemsiz və obyektin ayrı-ayrı elementləri ilə manipulyasiya etməklə keçir. Onlar məkan münasibətlərini ifadə edən məntiqi-qrammatik strukturları çətinliklə dərk edirlər. Belə tapşırıqları həll edərkən sözlü hesabat vermək onlar üçün mürəkkəbdir. Beləliklə, təfəkkürün bütün növlərində təhlil-tərkib fəaliyyətinin kifayət qədər formalaşmaması haqqında danışmaq mümkündür: uşaqlar çoxelementli fiqurun tərkib hissələrini ayırd etməkdə, elementlərin yerləşmə xüsusiyyətlərini təyin etməkdə çətinlik çəkir, onlar az gözəçarpan detalları nəzərə almır, tərkib fəaliyyəti çətinləşir. Obyektin analizi plansızlığı, birtərəfliliyi və kifayət qədər dəqiqliyin olmaması ilə fərqlənir. Nəticədə uşaqlar öz hərəkətlərinin nəticəsini görməyi bacarmırlar.

İdrak fəaliyyətinin xarakteri adətən reproduktivdir, yeni obrazların yaratmaq qabiliyyəti aşağıdır. PİL uşaqlar ümumiləşdirmə zamanı əhəmiyyətli əlamətləri nəzərə almır, situativ və ya funksional əlamətlərə əsasən ümumiləşdirirlər. Məsələn, “Divan, şkaflar, çarpayılar, stullar anlayışlarını bir sözlə necə adlandırmaq olar?” sualına uşaq: “Bunlar bizim evdə var” və yaxud “Bunlar hamısı otaqda durur” kimi cavablar verə bilər. Əşyaların müqayisəsi zamanı da təsadüfi əlamətlərə istinad edilə bilər. Məsələn, “İnsanlar və heyvanlar hansı cəhətlərinə görə bir-birinə bənzəmir?” sualına uşaq belə cavab verir: “İnsanların ləpikləri var, heyvanların isə yoxdur”.

Bununla belə, əqli geriliyi olan uşaqlardan fərqli olaraq, PİL uşaqlar kömək aldıqdan sonra təklif edilən tapşırıqları daha yüksək, normaya yaxın səviyyədə icra edə bilərlər. PİL uşaqlar 7 yaşınaqədər aşağıdakıları bacara bilərlər:

- Əyani əlamətlərə görə (rəng, forma) əşyaları təsnif etmək;
- Materialı və onun ölçülərini ümumi əlamətlər kimi çətinliklə də olsa ayırd edirlər;
- Təsnifatın bir prinsipindən digərinə keçid prosesində çətinlik çəkirlər;
- Təklif edilən iki mühakimə əsasında əqli nəticənin çıxarılması onlar üçün əlçatmazdır;
- İntellektual priyomların yaradıcı şəkildə tətbiqi tələb olunduqda çətinlik çəkirlər.

PİL uşaqların təfəkkür pozulmalarının aşağıdakı variantları mümkündür:

1. Əyani-əməli təfəkkürün nisbətən yüksək inkişafı fonunda sözlü-məntiqi təfəkkür geri qalır;
2. Təfəkkürün hər iki növü inkişafdan qalır;
3. Sözlü-məntiqi təfəkkür normaya yaxınlaşır, lakin əyani-əməli təfəkkürün inkişafı aşağıdır (nadir hallarda rast gəlinir).

Mərkəzi sinir sisteminin funksional vəziyyətinin yetişməməsi şəraitində PİL uşaqlarda nitqlə bağlı spesifik pozulmalar olur.

Loqopediyada nitqin ümumi inkişafdan qalması ayırd edilir ki, bu ad latında anomal nitq inkişafının xüsusi forması başa düşülür. Bu zaman nitq sisteminin bütün komponentlərinin formalaşmasının pozulması nəzərdə tutulur: əqli geriliyin və eşitmə qüsurunun olmaması şəraitində fonetik və leksik-qrammatik pozulması. Nitqin ümumi inkişafdan qalması zamanı uşağın ətrafdakılarla ünsiyyətində intonasıya və jestlər böyük rol oynayır. Bundan əlavə loqopediyada nitqin ləngiməsi fərqləndirilir. Bu zaman adətən, mərkəzi sinir sistemində morfoloji dəyişikliklər təzahür etmir. Pozulmalar geri qayıdan neyrodinamik xarakter daşıyır. Bu uşaqlarda müxtəlif patoloji vəziyyətlərin, həmçinin tərbiyənin münasib olmayan təsirləri nəticəsində meydana çıxır (valideynlərin kar-lallığı, yaxın ətrafdakıların nitq pozulmaları, ikidillilik və s.).

PİL uşaqların əksəriyyətində tələffüz və fonematik inkişafın çatışmazlıqları müşahidə olunur. Bunların içərisində dizartriya geniş yayılmışdır. Belə uşaqların əksəriyyəti oxşar səsli fonemləri qavramaqda çətinlik çəkir, nəticədə onlara yönəlmiş nitqi kifayət qədər dərk edə bilmirlər. Bununla

bərabər səslərin düzgün artikulyasiyasını oliqofrenlərə nisbətən daha yaxşı və sürətlə mənimsəyirlər. PİL uşaqların lüğət ehtiyatı məhduddur, passiv lüğət aktiv lüğəti kəskin şəkildə üstələyir. Onların nitqində sifətlər, zərflərə az rast gəlinir, fellərin işlənməsi də məhduddur. Tədqiqatçılar göstərir ki, normal inkişaf edən uşaqlar tərəfindən əşyalarla manipulyasiya nəticəsində sifətlərin sayı artır. PİL uşaqlar əşyaları əllərinə alıb, toxunub, diqqətlə nəzərdən keçirməyə cəhd göstərmirlər. Nəticədə, onların nitqində yeni sifətlər meydana gəlmir. Onlar əşyanın eyni vaxtda bir neçə əlamətini sadalamır, əgər sadalayırlarsa onda bütün əlamətlər bir əşyaya aid edilir: məsələn, “qələm böyük, kiçik”, “qırmızı, mavi, ağ, sarı don” (normal uşaqlarda isə: “qələm ağdır, lakin müxtəlif rəngli ola bilər”).

Tədqiqatçı E.S.Slepoviç PİL uşaqların sifətləri işlədərkən etdikləri tipik səhvləri təsvir etmişdir. Əşyanın əlamətini ayırd edərək onu müvafiq sözlə ifadə etməkdə çətinlik çəkirlər. Məsələn, boz rəngli papaq “qara”, böyük papaq “başə sığmayan çox uzun “kimi, yumurtavari armud “yumru”, qalın kəndir isə “enli” kimi adlandırılır. Bəzən sifətlər müvafiq əşyalara uyğun gəlmir (kvadrat fil, xeyirxah kəndir).

PİL uşaqlar məktəbdə yazı və oxunu çox böyük çətinliklərlə öyrənirlər. Tez-tez formaca yaxın hərfləri qarışdırırlar. Mürəkkəb samitləri səhv işlədirlər. Məktəb təliminin ilk mərhələsində onlar daha çox oliqofenlərə bənzəyirlər (fonematik eşitmənin inkişafdan qalması, pəltəklik). Lakin onlar fəaliyyətin oyun formasında daha yaradıcı olur, nağıl və hekayələrin məzmununu daha yaxşı anlaşırlar. PİL uşaqlarla korreksion iş düzgün təşkil edildikdə inkişafda təkən baş verir. Bu gün ancaq pedaqoqun köməyi ilə edə bildiklərini sabah onlar özləri müstəqil şəkildə icra edə biləcəklər. Onlar kütləvi məktəbi qurtara bilir, texnikumlarda və hətta ayrı-ayrı hallarda ali məktəblərdə də oxumağı bacarırlar.

Əqli inkişafın ləngiməsi olan uşaqlar adətən, emosional dayanıqsızlıqla fərqlənirlər. Onlar uşaq kollektivinə çətinliklə uyğunlaşır, əhvali-ruhiyyənin dəyişkənliyi və yüksək dərəcədə yorulma onlar üçün xarakterikdir.

Məktəbəqədər yaşlı PİL uşaqlarda emosional dayanıqsızlıq, bütün fəaliyyət növlərində özünə nəzarətin pozulması, aqressiv davranış, oyun və məşğələ zamanı kollektivə çətin uyğunlaşma, boş-boşuna vurnuxma, əhval-ruhiyyənin tez-tez dəyişməsi, özünə inamın azlığı, qorxu hissi müşahidə edilir.

Belə uşaqlara valideyn nəzarətsizliyi şəxsiyyətin patoloji inkişafına səbəb ola bilər: öz emosiya və istəklərini ləngitməyi bacarmamaq, impulsivlik, borc və məsuliyyət hissənin olmaması və s. PİL uşaqlar simpatiya hisslərini adətən, nitqsiz həyata keçirir, əldən tutur, gülümsəyir, başqa adama qısıllırlar.[3. s 56]

PİL uşaqlarda mənəvi-etik sferanın formalaşmasında da problemlər meydana gəlir: sosial emosiya sferası ləngiyir, uşaqlar öz həmyaşıdları ilə “isti” emosional münasibətlərə hazır olmur, yaxın yaşlılarla emosional kontakt pozulur, uşaqlar davranışlarında mənəvi-etik normalara zəif şəkildə istiqamətlənirlər. PİL uşaqlar sistemətik təlim şəraitində öz davranışlarını təşkil edə bilmədiklərinə baxmayaraq, oyun fəaliyyətində, təsviri fəaliyyətdə, nağılları dinləyərkən kifayət qədər aktiv olurlar. Tez-tez tanış tapşırığı yeni şəraitdə icra etməkdə çətinlik çəkirlər. Onların fəaliyyətinə tənqidi yanaşmadıqda, hər bir uğurunu təqdir etdikdə oyun fəaliyyətinin emosional fonu dəyişir. Onlar daha sakit, mehriban, oyuna münasibətləri daha xeyirxah olur. Belə olduqda, otaqda boş-boşuna, məqsədsiz gəzəşmə dayanır. Belə uşaqların əksəriyyətində sevimli oyuncaqlar və oyunlar meydana gəlir. Yaşlıların onların oyun fəaliyyətini qiymətləndirməsi uşaqlarda müsbət emosiya yaradır. Belə olduqda onlar daima tərbiyəçilərə müraciət edərək öz uğurlarını nümayiş etdirir və tərifə qarşı həssas olurlar.

PİL uşaqların ünsiyyəti həm məzmununa, həm də vasitələrinə görə çox kasaddır. Oyun fəaliyyətində əsasən işgüzar münasibətlər üstünlük təşkil edir: şəxsi kontakt kənara qoyulur, emosiya kifayət etmir, oyunu tənzimləyən qaydalar sərt xarakter alır, digər variantlar istisna edilir. Qaydaların tətbiqində çeviklik müşahidə edilmir. Bu uşaqlarda həmyaşıdları, həm də

yaşlılarla ünsiyyət tələbatı aşağı səviyyədədir. Fəaliyyət zamanı çətinlik çəkən uşaq yaşlıya kömək üçün müraciət etməkdənsə, oyunu dayandırmağa üstünlük verir. Yaşlılarla ünsiyyət əsasən işgüzar xarakter daşıyır: “Onu mənə ver”, “Məni anam götürəcək”, “Mən məşğul olmaq istəmirəm” və s. Belə uşaq öz təşəbbüsü ilə yaşlı ilə kontakta çox nadir hallarda girir.

Tədqiqatçılar PİL uşaqların oyun fəaliyyətinin pozulmalarını iki növə ayırırlar:

1. Oyunun bir fəaliyyət kimi kifayət qədər formalaşmaması ilə bağlı olan pozulmalar (bu kateqoriyalı uşaqların psixoloji xarakteristikası ilə əlaqədar);
2. Oyun fəaliyyəti üçün xarakterik olan spesifik pozulmalar.

Spesifik pozulmalara aşağıdakılar aiddir:

- Motivasiya komponentinin formalaşmasında çətinliklər;
- PİL uşaqlar üçün süjetli oyunlar sərt məhdudiyyətlər yaradır;
- Oyun fəaliyyətinin əməliyyat tərəfinin spesifikliyi;
- Münasibətlərin modelləşdirilməsinin səthiliyi.

Normal uşaqlardan fərqli olaraq, PİL uşaqlarda həm oyuna, həm də oyuncaqlara maraq aşağıdır. Yüngül formalı PİL uşaqlar gəlinciyi oyunda tərəfmüqabil kimi istifadə edə bilirlər. Ağır formalı PİL uşaqlar isə çoxfunksiyalı oyuncaqlara üstünlük verirlər. PİL uşaqların rol davranışı impulsivdir, onlar normal inkişaf etmiş uşaqlardan fərqli olaraq, qaydalara daha az istiqamətlənilirlər. Rolun funksiyaları onlar üçün fəaliyyətin tənzimlənməsi əlamətində çıxış etmir. Məsələn, “Xəstəxana” oyununda xəstə həkimin oyun atributlarını tutur və seçir. PİL uşaqlar oyun zamanı az ünsiyyət edir, oyun birləşmələri davamsız olur, tez-tez konfliktlər meydana çıxır, tərbiyəçinin köməyi olmadan kollektiv oyun alınmır.

E.S.Slepoviç və S.S.Xarin (1988) məktəbəqədər yaşlı PİL uşaqların oyun fəaliyyətinin xüsusiyyətləri ilə bağlı aşağıdakı nəticələrə gəlmişlər:

1. Böyük məktəbəqədər yaşlı PİL uşaqlar oyun fəaliyyətinin formalaşma səviyyəsinə görə yekcins deyillər;
2. Bütün məktəbəqədər yaşlı PİL uşaqlarda oyun fəaliyyətinin müstəqilliyi sahəsində aktivlik kəskin şəkildə aşağı düşmüşdür;
3. Oyuncaqlara qarşı maraq ya yoxdur, ya da nadir hallarda müşahidə edilir;
4. PİL uşaqlar süjetli oyun çərçivəsində birgə fəaliyyəti müstəqil təşkil etməyi bacarmırlar;
5. PİL uşaqlarda situasiyanın təxəyyüldə formalaşdırılması əsaslı çətinliklərlə qarşılaşır;
6. Oyun zamanı təxəyyüldə yaradılan situasiyanın canlandırılmasının çətinliyi obrazlı sferanın kasadlığı ilə bağlıdır;
7. PİL uşaqlar üçün insanlar arasındakı münasibətlərin ayırd edilməsi və dərk olunması xüsusilə çətinlik yaradır;
8. Məktəbəqədər müəssisələrdə hal-hazırda mövcud olan oyun davranışının təşkili üçün tətbiq olunan forma və priomlarla PİL uşaqların oyun fəaliyyətinin formalaşdırılması mümkün deyildir.[4. s 48]

PİL uşaqların məktəb təliminə hazırlığı problemləri son illər ərzində korreksion pedaqogika tərəfindən öyrənilməkdədir. Məktəb təliminə hazırlıq dedikdə, öyrənmə bacarıqlarını yaradan kompleks keyfiyyətlər başa düşülür. Bu keyfiyyətlər kompleksinə uşağın təlim vəzifələrinin məzmununu dərk etməsi, fəaliyyətin yerinə yetirilməsi üsullarını anlaması, özünə nəzarət və özünü qiymətləndirmə vərdisləri, iradi keyfiyyətlərin inkişafı, müşahidə etmək, dinləmək, yadda saxlamaq və tapşırıqların həllinə nail olmaq bacarıqlarının inkişafı daxildir. Məktəbə intellektual, sosial-psixoloji və iradi hazırlıq xüsusilə vacibdir. PİL uşaqların məktəbə hazırlığının xüsusi diaqnostik meyarları hazırlanmışdır. Bu meyarlar içərisində aşağıdakılar təlim fəaliyyətinin komponentlərinə aiddir:

- Motivasiyaedici
- Əməliyyat
- Tənzimləyici

Göstərilən meyarlar əsasında 6 yaşlı PİL uşaqların təlimə daha az qabiliyyətli olması, məşğələlərə marağın, özünütənzim və nəzarətin, öz fəaliyyətlərinin nəticəsinə tənqidi münasibətin olmaması müəyyən edilmişdir. PİL uşaqlarda təsviri bacarıqlar sxematik və sadə olur. Süjetli şəkilləri çəkməyi bacarmırlar, süjetin məzmununu formalaşdırma bilmirlər. Şəkillərin bir çoxu sxemlər səviyyəsində qalır. Əksər uşaqlarda şəkil çəkmək üçün texniki bacarıqların aşağı səviyyəsi, əllərin hərəkətinin çevikliyinin olmaması xarakterikdir. Uşaqlar qələmi, fırçanı düzgün tuta bilmir, kiçik əşyaları çəkməkdə çətinlik çəkir, rəngləmə bacarıqlarına malik deyillər.

İbtidai məktəbdə PİL uşaqların sayı 5-11 % qədər olur. Yeni fəaliyyət formasına keçid üçün uşaqlar fəaliyyət motivlərini yenidən qurmalıdırlar. Psixofiziki infantilizmi olan uşaqlar buna hazır olmurlar. Ona görə də , məktəbə daxil olan momentdə onlar təlimə hazır deyillər. Belə uşaqlar məktəb məşğələlərinə pis qoşulur, tapşırıqları qavraya bilmir, onlara maraq göstərmir, təlimin ilk mərhələlərində tələbləri anlamır, məktəb həyatının qaydalarına tabe olmurlar. PİL uşaqlar məşğələ zamanı ətalətli, süst, qeyri-produktiv görünürlər. Bəzi hallarda onlarda baş ağrıları, yüksək yorğunluq yaranır. Oyun zamanı isə onlar dirçəlir, təşəbbüskar və emosional oyanıqlı olurlar. Onlar ancaq maraqları və oyunlarla bağlı tapşırıqları yerinə yetirməyi bacarırlar. İdraki fəaliyyətin mürəkkəb növlərini tələb edən tapşırıqlar isə onlar üçün obyektiv surətdə əlçatmaz olur.

PİL uşaqların məktəb müvəffəqiyyətinə aşağıdakı amillər təsir edir:

- Sınıfdə psixoloji iqlim (yaradıcı və yoldaşlıq mühiti mənimsəməyə müsbət təsir edir, həmçinin şagirdə müsbət xarakter əlamətlərinin formalaşmasına yaxşı təsir göstərir).
- Müəllimin şəxsi keyfiyyətləri (ilk növbədə ağıllı tələbkərlilik, uşaqda müsbət cəhətlərin müəyyənləşdirilməsi və bu müsbət cəhətlərə əsaslanaraq təlimdəki çətinlikləri aradan qaldırmağa kömək etmək).

Ağır formalı PİL uşaqlar kütləvi məktəb proqramını demək olar ki, mənimsəyə bilmirlər. Onlarda təlim motivləri formalaşmır. Həmyaşıdları arasında münasib olmayan vəziyyətə düşən PİL uşaqlarda bir sıra hiperkompensator reaksiyalar meydana gəlir. Onlar erkən intellektual səviyyədə daha möhkəm surətdə inkişaf edir, nitq inkişafında əsaslı qüsurlara rast gəlinir, intellektual aktivlik azalır. Bir illik məktəb təlimindən sonra PİL uşaqlar hərfləri öyrənə, imla yazma bilmir, mətnə cümləni fərqləndirməyi bacarmır, elementar hesab əməliyyatlarının öhdəsindən gəlmirlər. Lakin, yaxşı şəkillər çəkirlər. Yazı elementləri ilə şəkilləri müqayisə etdikdə uşağın məktəb təliminə hələ hazır olmadığı görünür.

Tədqiqatçılar məktəbəqədər yaşlı PİL uşaqların fəaliyyətinin xüsusiyyətlərini öyrənərək onları şərti olaraq iki qrupa ayırmışlar:

1. Yerinə yetirdikləri işə maraq nümayiş etdirən uşaqlar. Onlar çətinliklə qarşılaşdıqda məqsədyönlü fəaliyyət pozulur, aktivlik azalır, hərəkətlər cəsarətsiz olur.
2. Yerinə yetirdikləri işə daha az maraq göstərən və aktivliyi yüksək olmayan uşaqlar. Belə uşaqlar çətinliklə qarşılaşdıqda maraq və aktivlik daha da azalır, işin davam etməsi üçün daha çox itələmə tələb olunur, müxtəlif həcmli köməyə baxmayaraq, müvəffəqiyyət səviyyəsi birinci qrupa nisbətən daha az olur.

PİL uşaqların idraki fəallığı da spesifikliyi ilə fərqlənir:

- Onlar tapşırığı yerinə yetirmək üçün ayrılmış vaxtdan istifadə etməyə cəhd göstərmirlər;
- Yada salmaq üçün daima kənardan təhriklərə ehtiyac hiss edirlər;
- Yaddaş xatırlama yüngülləşdirən priyomları tətbiq etməyi bacarmırlar;
- Özünə nəzarətin səviyyəsi kəskin şəkildə azdır;
- Fəaliyyətin qarşıya qoyulan məqsəddən asılılığı zəifdir;
- Çətin məqsəd daha asan və tanış olan məqsədlə əvəz olunur;
- Tapşırığın şərtləri azca dəyişən kimi həllə səhvlər meydana çıxır;
- Əşya və hadisələr haqqında biliklərin səthliliyi və natamamlığı müşahidə olunur.

Tədqiqatçılar PİL uşaqların fəaliyyəti üçün aşağıdakı xarakterik əlamətləri göstərir:

- Hərəkətlərin impulsivliyi
 - Tapşırığı yerinə yetirən zaman özünə nəzarətin aşağı səviyyəsi
 - İş zamanı məqsədyönlülüyn olmaması
 - Fəaliyyətin məhsuldarlığının aşağı olması
 - Fəaliyyət proqramının pozulması və ya itirilməsi
 - Fəaliyyətin verballaşdırılması zamanı aydın təzahür edən çətinliklər.
- PİL uşaqların əksəriyyətində bütün fəaliyyət növlərində aktivlik aşağı olur.

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Xülasə

Uşaq şəxsiyyətinin inkişafı problemi uşaq psixologiyasının daim araşdırılan problemidir. Uşaq ailədə dünyaya gəlir və ilkin olaraq ailə üzvləri ilə, xüsusən də valideynləri ilə ünsiyyət qurur. Həyata, insanlara, əşyalara dair hər bir şeyi uşaq ailədə münasibətlər axarında mənimsəyir və şəxsiyyətini inkişaf etdirir. Tədqiqat işində valideyn-uşaq münasibətlərində davranış tərzinin, uşaq şəxsiyyətinin inkişafına təsiri məsələsi araşdırılmışdır. Valideynlərin uşaqları ilə qurduqları münasibətlər, davranış tərzləri onların şəxsiyyətində bəzi xarakterik xüsusiyyətlərin formalaşmasına səbəb olur. Tədqiqat işində demokratik, avtoritar, həddindən artıq yumşaq, həddindən artıq qoruyucu, qeyri-sabit, mükəmməliyyətçi və rəddedici valideyn mövqelərinin uşaq şəxsiyyətində nə kimi xüsusiyyətlərin formalaşmasına səbəb olduğu araşdırılmışdır.

Summary

The problem of child personality development is a constantly researched problem of child psychology. A child is born in a family and initially communicates with family members, especially with parents. A child learns everything about life, people, and things in the course of relationships in the family and develops his personality. In the study, the issue of behavior in parent-child relationships and the influence of child personality development was investigated. The relationships and behavior of parents with their children lead to the formation of some characteristic features in their personality. In the research work, it was investigated what characteristics the democratic, authoritarian, overly soft, overly protective, unstable, perfectionist and rejecting parental positions lead to the formation of children's personality.

Açar sözlər: valideyn mövqeyi, avtoritar, demokratik, hədsiz qoruyucu, mükəmməliyyətçi.

Keywords: parental position, authoritarian, democratic, overprotective, perfectionist

Ailə uşağın inkişafında çox önəmli rolu ilkin kiçik qrupdur. Ailə üzvləriylə olan münasibətlər uşağın digər şəxslər, əşyalara və həyata münasibət və davranışının əsasını təşkil edir. Ailə həm də uşağa ailənin və cəmiyyətin üzvü olduğunun şüurunu aşılayır və uyğunlaşma formalarının əsasını qoyur [3, 112].

Uşağın inkişafında ailənin ən təsirli köməyi aşağıdakı kimi sadalana bilər:

- Ailənin qrup daxilində uyğun bir şəxs ola bilməsi üçün uşağa inam hissi aşılayır.
- Sosial qəbul edilməsi üçün lazımi mühiti hazırlayır.
- Sosiallaşmağı öyrənmək üçün qəbul edilmiş uyğun davranış nümunələrini özündə birləşdirən bir model yaradır.
- Sosial olaraq qəbul edilmiş davranış formalarının inkişafına rəhbərlik edir.
- Ətraf mühitə, həyata uyğunlaşarkən uşağın qarşılaşdığı problemlərin həll edir.
- Adaptasiya üçün lazımlı davranışla bağlı şifahi və sosial vərdislər qazanmağına kömək edir.
- Məktəbdə və ictimai həyatda uğurlu olmaq üçün uşağın qabiliyyətlərini stimullaşdırır və inkişaf etdirir.
- Uşağın maraq və bacarıqlarına uyğun istəklərin inkişafına kömək edir [3,214].

Uşağın inkişafın ailənin nə dərəcədə təsir göstərməsi və ya hansı təsirlərin daha çox üstünlük təşkil etməsi iki amildən asılıdır. Bunlar:

1. Ailənin necə olması.
2. Fərqli ailə üzvlərinin təsiri.(atanın olmadığı evdə uşağın anası ilə münasibəti, atası olan uşağa görə fərqlidir) [5, 91].

Ana-ata-övlad münasibətləri əsasən ana və atanın davranış mövqeyindən asılıdır. Uşaqlar arasında adaptasiya pozğunluğuna səbəb olan bir çox halların araşdırılan zaman yetərli və uyğun olmayan valideyn-övlad münasibətlərinin səbəb olduğu aşkar edilmişdir. Valideynlərin münasibət və davranışlarını təşkil edən səbəblər araşdırıldıqda, valideynlərin uşaqlara qarşı münasibətlərinin bütün münasibətlərdə olduğu kimi öyrənmənin məhsulu olduğu görülür. Valideynlərin övladlarına münasibətlərinə təsir edən əsas amillər aşağıdakı kimi sadalana bilər:

- Valideynlərin zehində doğuşdan necə bir uşaq istədikləri ilə bağlı xəyali uşaq fikri formalaşır. Doğulan uşaq valideynlərin gözləntilərinə uyğun deyilsə, yaşanan xəyal qırıqlığı ana və atada rədd etmə münasibəti yaranır.
- Cəmiyyətin mədəni dəyərləri, ana və ataların övladlarını böyütməyə münasibətlərinə təsir edir.
- Valideyn rolundan zövq alan və vəzifələrini layiqincə yerinə yetirdiklərinə inanan valideynlərin münasibəti, övladlarını necə tərbiyə edəcəyini bilməyən, özünə inamsız və bacarıqsız hiss edən valideynlərdən daha uğurlu və müsbətdir.
- Övladlarının sayı, cinsi və şəxsiyyət xüsusiyyətlərindən məmnun olan ana və atalar, olmayanlarla müqayisədə daha uyğun davranış mövqeyinə sahibdirlər [4, 79].

Bütün bunların xaricində, valideynlərin uşaqılıq illərindəki təcrübələri mövcud münasibətlərdə təsirli ola bilər. Uşaqılıq illərində valideynləri ilə sağlam qarşılıqlı əlaqə qura bilməyən kifayət qədər sevgi görməyən bir atanın və ya yeniyetmə yaşlarında həddindən artıq təzyiq altında böyüyən bir ananın münasibəti bu mənfi təcrübələr səbəbindən mənfi ola bilər. Eyni zaman ailədəki ər-arvad münasibətləri uşaqlara münasibətə təsir edən başqa bir amildir.Məsələn, həyat yoldaşı ilə anlaşı bilməyən ana, bütün sevgisini övladına verə bilər və ya əksinə aqressiv bir münasibət göstərə bilər. [1, 98].

Valideynlərin keçmiş təcrübələri uşaqları ilə bağlı bəzi planlar qurmasına səbəb olur. Uşaqılığını çətin şərtlərdə keçirən ata və ya ana maddi imkanları olan kimi uşaq üçün ən yaxşı mühiti hazırlamaq istəyir. Bunun üçün uşağın maraq və qabiliyyətindən asılı olmayaraq balet, musiqi, xarici dil kimi sahələrdə kurslara aparır. Bütün bunları edərkən, valideynlərin ən böyük səhv, uşaqlarını tanımadan, maraqlarını və qabiliyyətlərini təyin etmədən onları öz istəklərinə görə yönəltməkdən qaynaqlanır [4, 86].

Böyümə mərhələlərində uğurla olan uşaqlar, yaxşı ailə münasibətləri tərbiyəsi görmüş şəxslərdir. Ailə daxilindəki uğurlu münasibətlər, depressiyadan uzaq olan xoşbəxt, mehriban və konstruktiv şəxsiyyətlərin formalaşmasına səbəb olur, əksinə, uyğunlaşma pozğunluğu olan uşaqlar, ümumiyyətlə, uğursuz bir valideyn-övlad münasibətinin məhsuludur. Valideynlərinin məhəbbətindən və qayğısından məhrum olaraq böyüyən uşaqlar, sevgi üçün böyük bir aclıq göstərirlər ki, bu da bəzi davranış və uyğunlaşma pozğunluqlarına səbəb ola bilər [2, 220].

Diana Baumrində görə uşaqlarda şəxsiyyətin inkişafında ailədə ana-atanın uşaqlara davranış tərzini, ona göstərdikləri münasibətdən asılıdır.

Demokratik mövqedə olan ailələrdə uşaqlar şərtsiz sevilir, şərtsiz qəbul edilir. Uşaqlara dəstək olunur. Qaydalar uşaqla bərabər qəbul olunur. Uşaqlar özünə inam formalaşır, özünü dəyərli hiss edir.

Avtoritar ailədə valideynlər qəti qaydalara meyilli, sərt mövqedədirlər. Bu cür münasibətə görə uşaq disiplinli, yardımsevər, nəzakətli, qayğıkeş olduqları halda qorxaq, çəkinən, özünüqiymətləndirməsi aşağı, həssas, başqalarının təsiri altında qalan, öz qərarlarını verə bilməyən şəxsiyyətə çevrilir [5,91].

Bu davranışı mənimsəyən ana- atalar demokratik davranışın tam əksinə olaraq övladlarının özlərindən fərqli bir fərd olduğu düşüncəsinə sahib deyillər. Bu davranışın əsas xüsusiyyəti uşağa qarşı edilən təsirdir.

Ana-ata uşaqlarına qəti olaraq hakim olduqlarına inanırlar. Heç bir aydınlıq gətirmədən qoyulan qayda və qanunlar vardır. Uşaqlar ana-atanın qoyduğu bu qayda-qanunlara qeyd-şərtsiz əməl və itaət etməlidir. Burada davamlı qiymətləndirmə, nəzarət etmə və istiqamət verməyə cəhd vardır, istənilməyən davranışlar cəzalandırılır. Bu cəza çox zaman sözlə tənqiddən, təhqirdən alçaldılmağa, hətta döyülməyə qədər gedib çıxa bilər. Münasibətin birtərəfli olması və müdaxiləçi davranış ana-ata-uşaq əlaqəsində sevgi və nəvazişə bağlı olan əlaqəni mane ola bilər. Münasibətlərdə daha çox qorxu və hirs duyğuları hakimdir. Bu formada tərbiyə edilən, böyüdülmə uşaqlar hiss (xüsusilə də hirs və əsəbilik hisslərini) və düşüncələrini asan ifadə edə bilməyən, avtoritet mühitə boyun əyən, amma olmadığı zaman da qayda-qanunlara qarşı çıxan insanlardır. Özlərindən güclü insanlara qarşı itaətkar hərəkət göstərən, özlərindən gücsüzlərə qarşı isə amansız olurlar [6].

Həddindən artıq yumşaq mövqe. Bu davranış tərzini mənimsəmiş ana-atalar, əsasən, uşaqlarının hər etdiklərini xoş qarşılayır, bəzən uşaqları ilə bağlı hissləri zəif, bəzən isə onlara qarşı isti və sevimli olurlar. Davranışlarındakı ən əsas xüsusiyyət uşaqlarını heç bir tərzdə idarə etməmələri və uşaqlarının istədiyi hər şeyi etmələrinə icazə vermələridir. Bu uşaqların yemək, yuxu və televizora baxma kimi istəkləri tamamilə onların özünə aiddir. Ailə daxilində problem olmayan bu davranışlar ictimai qaydaların başladığı məktəb, iş və dostluq mühiti kimi sosial mühitlərdə problem olmağa başlayır. Arzu və istəklərinə nəzarət edilməsini, idarə edilməsini öyrənməmiş olan uşaq xarici aləmdə üzləşdiyi çətinliklər qarşısında nə edəcəyini bilmir. Belə bir vəziyyətdə uşaq aqressiv hərəkətlər nümayiş etdirə bilər, ya da çox vaxt adaptasiya ola bilmədiyi üçün digərləri tərəfindən təcrid edilə bilər [5,92].

Öz ana-atalarından görmüş olduqları icazəverici davranışları digər insanlardan görməmək onlarda bədbinlik yarada bilər. Qarşı çıxılmağa, eləcə də arzu və istəklərinə nəzarət etməyə öyrənməmiş olmaları konsentrasiya və bir sıra bu kimi xüsusiyyətləri inkişaf etdirmələrinə maneələr törədir. Bu cür ana-atalar uşaqlarının hər istədiklərini etdikləri halda məmnun olmadıqlarını, ya da dərslərinə maraq göstərmədiklərini anlaya bilməzlər. Halbuki, uşaq istək və arzularını nəzarətdə saxlamağı öyrənmədiyinə görə, diqqət və cəhd göstərməyi tələb edən işlərdən tez bezir [6].

Bu davranış tərzinə sahib olan ana-atalar övladları ilə münasibətlərini çox zaman məktəb illərinə qədər problemsiz davam etdirdikləri halda, məktəblə birlikdə problemlər yaşamağa başlayırlar. Belə ki, artıq daha əvvəllər kiçik olan böyüməyə və təmin edilməsi çətin olmağa başlayır. Uşaq artıq istədiyi yerə getmək, istədiyi saatda evə gəlmək kimi ana-atanı narahat edəcək, ya da mobil telefon, motosiklet, hətta 14-15 yaşlarında maşın istəmək kimi maddi ağırlığı çox olan tələblər edir. Ana-ata üçün bunların təmin edilməsi hər zaman asan olmur. Müəyyən bir mövzuya maraq göstərən onunla məşğul olmanın çətin olduğu, qeyri-məmnunluğun olduğu vəziyyətlərdə insanlar özlərinə daima dəyişən maraqlı yollar axtarırlar ki, bu cür bir axtarış yolu da çox zaman münasib olmayan üsullara, vərdislərə səbəb olar. Bu kimi hərəkətlər, xüsusilə də yetkinlik dövrünün başlanğıcında siqaret, içki, narkotik maddələrdən istifadə və sürətli maşın sürmə kimi maraqlara səbəb ola bilər. Yenə bu ana-ataların ən böyük kədəri uşaqlarının məktəbdə uğursuz olmalarıdır. Daha kiçik yaşlarda hər istəyi mütləq yerinə yetirilən və idarə edilməyən, istiqamətləndirilməyən uşaq artıq ana-atanın nailiyyət istəkləri ilə qarşı-qarşıyadır və ondan, istəməsə də, bəzi vəzifələrə əməl etməsi istənilməkdədir. Ana-ata uşağın bu istəklərə əməl etmədiyi hallarda çox zaman onu “biz sənin üçün hər mövzuda fədakarlıq etdik, səndən sadəcə məktəbdə nailiyyət əldə etməni istəyirik” şəklində günahlandırır. Amma bu vəziyyət uşağa köməkçi olmaqdan çox, ona maneçilik edir. Çünki uşaq nailiyyət əldə etməsi üçün lazımi səbirə, daxili

istiqamətlənməyə və intizama sahib deyildir. Elə bu nöqtədə də ana-ata-uşaq münasibətlərində qarşıdurmalar artmağa başlayır.

Hədsiz dərəcədə qoruyucu mövqedə olan ailələrdə uşaqlar daim nəzarət altında saxlanılır. Hədsiz diqqət və qayğı göstərilir. Uşağa xəsarət gəlməsindən qorxduqları üçün küçəyə çıxmağa belə icazə verilmir. Bu tip ailələrdə böyüyən uşaqlar ailəyə hədsiz bağlı, özünüqiymətləndirməsi olmayan, çətin vəziyyətə düşdükdə günahı başqalarına atan şəxsiyyət olaraq formalaşır [4, 147].

Belə bir davranışı mənimsəyən ana-atalar, adətən uşaqları üçün xəyali bir dünya quraraq, onu dünyadakı bütün zərər və pisliklərdən qorumağa çalışırlar. Demokratik davranışın əksinə olaraq, onlar uşaqlarına hər zaman səlahiyyət vermirlər, çünki uşaqları bacarmaz, səhv edər, bilavasitə zərər görər deyər fikirləşirlər. Uşağın edə biləcəyi bir çox şey böyüklər tərəfindən edilir. Uşaqlarının yaxşı qidalanması üçün əl ilə bəsləməkdən başlayaraq (özbaşına qidalana biləcək yaşda olmalarına baxmayaraq), ya da yorulmasın deyər, ev tapşırığını etməyə, hətta ailə qurmuş övladının ailə həyatını idarə etməyə qədər münasib olmayan müdaxilələr belə edirlər. Və çox zaman bu uşaqlar valideyn tərəfindən dəstək olmasa, bir çox işləri edə bilmirlər. Əksər hallarda bu cür ana-ataların uşaqları qorxaq, utanan, özlərinə güvənməyən, daim bir başqasının dəstəyini axtaran və müəyyən bacarıqlar baxımından həmyaşıdlarından daha az inkişaf etmiş uşaqlardır. Bu da uşağın, xüsusilə sosial münasibətlərdə passiv olmasına səbəb olur. Ev xaricindəki dünya onlar üçün həqiqətən adaptasiyası çətin və hətta təhlükələrlə doludur. Xüsusilə də özlərini müdafiə edəcək yetkinlərin olmadığı həmyaşd qrupları içində, oyun mühitində belə özlərini hiss etdirə bilməz, digər uşaqlar tərəfindən təcrid olunur və ələ salına, hətta müqavimətə belə məruz qala bilirlər.

Həddindən çox mühafizəçi ana-atalar uşaqlarını, adətən özlərinin bir davamı kimi görürlər və çox zaman da onlarla hissi çatışmazlıqlarını təmin etmək istəyirlər; uşağın ana-ataya olan asılılığını bir vəzifə olaraq mənimsəmiş olurlar. Cinslər arasında fərq göstərilir, xüsusən qız uşaqlarının müstəqil bir fərd olması təhlükəli olduğu üçün qız üzərində daha çox nəzarət etmək istəyirlər [1, 289].

Bu cür tərbiyə üsullarının əsasında yatan səbəblər uşağın ölən bir körpənin ardından doğulması; təhlükəli bir xəstəliyə tutulması; ər-arvad arasındakı konfliktlər; ana-atanın öz uşaqılıq çağlarında kifayət qədər sevgi mühitində böyüməmiş olması ola bilər.

Qeyri-sabit mövqedə olan ailə tiplərində qaydalar yoxdur, anlıq qərarlar vardır. Uşaq üçün qoyulan qaydaların bəzən sərt yanaşıldıqda, bəzən də əhəmiyyət verilmir. Ona görə uşaqda inamsızlıq, qaydalara qarşı diqqətsizlik özünü göstərir. Bu uşaqlar tez qərar dəyişən, fikirlərində qərarlı olmayan şəxsiyyət olaraq formalaşır.

Rəddedici mövqeyə malik ailə tiplərində uşağın istənmədiyini hiss etdirmək, düşmənçə münasibətin olması özünü göstərir. Bu tip ailələrdə böyüyən uşaqlarda özündən zəif olana incitmək, ətrafdakılara nifrət etmə, heç kimə inanmamaq, insanlara düşmənçə münasibətin olması özünü göstərir [5,93].

Mükəmməliyyətçi mövqeyə malik ailələr özlərinin reallaşdırma bilmədiklərini uşaqlarından gözləyən, eqosu yüksək ailələrdir. Bu tip ailələrdə böyüyən uşaqlarda etdiyi işi bəyənməmək, lazımsızlıq duyğusu, davamlı olaraq başqalarını xoşbəxt etməyə çalışmaq hissi özünü göstərir.

Nəticə

Tədqiqat işində valideyn davranış tərzlərinin uşaq şəxsiyyətinin inkişafına ciddi təsir göstərdiyi öz təsdiqini tapmışdır. Fərqli xarakter xüsusiyyətlərinə sahib tələbələrə apardığım “Ana-ata mövqeyi” anket sorğusunun nəticələrinə görə özünüqiymətləndirməsi yüksək olan tələbələrdə demokratik mövqeyə sahib ailə münasibətlərinin olduğu, utancaq, özünüqiymətləndirməsi aşağı olan tələbələrdə avtoritar mövqeyə sahib ailə münasibətlərinin olduğu, tez-tez qərar dəyişən tələbələrin qeyri-sabit ailə münasibətlərinə sahib olduğu özünü göstərdi. Bu kimi uyğun nəticələr digər davranış tərzlərində də öz əksini tapmışdır.

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АКТУАЛЬНЫЕ ВОПРОСЫ РАССТРОЙСТВ ПИЩЕВОГО ПОВЕДЕНИЯ (РПП) У ЖЕНЩИН В КАЗАХСТАНЕ И В МИРЕ

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Аннотация

Данная статья посвящена актуальной проблеме расстройств пищевого поведения (РПП) у женщин, исследуя их распространенность в Казахстане и мире. РПП, включая анорексию, булимию и компульсивное переедание, становятся все более заметными в современном обществе, нанося вред физическому и психическому здоровью. Исследование охватывает ключевые факторы, способствующие развитию РПП, такие как биологические предрасположенности, психологические особенности и влияние социальных норм, включая медийные идеалы красоты.

Статья анализирует состояние изученности проблемы, выявляя необходимость адаптации методов диагностики и лечения к локальным условиям. Также подчеркивается важность профилактических программ, направленных на повышение осведомленности о РПП и формирование здоровых привычек среди женщин. Результаты исследования подтверждают, что комплексный подход к изучению и лечению РПП может существенно улучшить качество жизни женщин, подверженных риску этих расстройств. В заключение, подчеркивается необходимость дальнейших исследований, направленных на анализ влияния культурных факторов и разработку эффективных интервенций для борьбы с РПП в Казахстане и за его пределами.

Ключевые слова: *расстройства пищевого поведения, анорексия, питание, женщины, здоровье, булимия, психологическое расстройство.*

Введение

Обоснование выбора темы

Проблема расстройств пищевого поведения (РПП) становится актуальной для многих стран, включая Республику Казахстан, поскольку влияет на здоровье и качество жизни женщин разных возрастных групп. Психологические расстройства, такие как анорексия, булимия и компульсивное переедание, оказывают разрушительное воздействие на организм, ведя к серьёзным последствиям, вплоть до инвалидности и летального исхода [1]. В мировом масштабе наблюдается рост числа случаев РПП, что связано с увеличением социального давления, культурными стандартами красоты и распространением стереотипов через медиа и социальные сети. К сожалению, Казахстан не является исключением: несмотря на культурные и социальные особенности, уровень заболеваемости и потребность в диагностике и лечении РПП здесь также растут в соответствии с ростом различных тенденций и веяний моды, особенно среди представителей подрастающего поколения [2].

Исходя из этого, выбор данной темы обусловлен её значимостью для современной медицины, психологии и социологии. В Казахстане исследования в области РПП только начинают развиваться, и эта статья может способствовать повышению осведомленности и инициированию научного диалога на данную тему. Рассмотрение причин, факторов риска и подходов к лечению РПП является важным шагом для улучшения состояния общественного здоровья и оказания своевременной помощи женщинам, страдающим этими расстройствами.

Состояние изученности проблемы

На сегодняшний день проблема расстройств пищевого поведения (РПП) активно исследуется в мировом научном сообществе, охватывая медицинские, психологические и социокультурные аспекты. Большинство современных исследований сосредоточены на анорексии, булимии и компульсивном переедании, изучая их причины, механизмы развития и методы лечения. В последние десятилетия ученые выявили влияние генетических факторов, гормональных нарушений, а также социальных и культурных стандартов, способствующих возникновению РПП. Наибольший вклад в эту область внесли западные исследования, где разработаны диагностические критерии и методы лечения, включающие когнитивно-поведенческую терапию и медикаментозные подходы [3, 4].

В Казахстане и других странах Центральной Азии изучение РПП до сих пор остаётся достаточно ограниченным. В отечественной научной литературе отслеживается определенный недостаток работ, посвящённых культурным и социальным факторам, влияющим на развитие РПП среди женщин в регионе [5]. Также отсутствуют данные по распространённости расстройств и не проведено достаточно исследований по местным подходам к лечению, адаптированным к казахстанским реалиям. Это указывает на необходимость дальнейших исследований, направленных на оценку культурных факторов и разработку эффективных терапевтических стратегий, учитывающих национальные особенности. Таким образом, актуальность проблемы РПП для Казахстана требует расширения научной базы, что позволит лучше понять причины и особенности течения расстройств в стране и улучшить системы поддержки для женщин, страдающих этими заболеваниями.

Актуальность темы

Актуальность темы расстройств пищевого поведения (РПП) среди женщин обусловлена их значительным распространением и серьёзными последствиями для физического и психического здоровья. По данным исследований, число женщин, страдающих анорексией, булимией и другими видами РПП, растёт, что связано с усилением социального давления и влиянием идеалов красоты, активно распространяемых через медиа и социальные сети [6, 7]. В Казахстане эта проблема также обостряется: изменения в образе жизни, увеличение стресса и доступ к цифровым технологиям способствуют увеличению числа женщин, подверженных риску РПП. Необходимо также подчеркнуть, что сложность проблемы усугубляется недостаточной осведомленностью населения и ограниченностью квалифицированной помощи [8]. Недостаток национальных исследований, направленных на анализ РПП в контексте культурных особенностей Казахстана, делает данную тему ещё более актуальной [9]. Изучение факторов риска и подходов к лечению РПП может способствовать повышению уровня осведомлённости, развитию профилактических программ и улучшению качества жизни женщин, что является важной задачей для сферы здравоохранения и общественного здоровья.

Соответствие проблемам современной науки и практики

Изучение расстройств пищевого поведения (РПП) у женщин отвечает актуальным задачам современной науки и практики, направленным на улучшение психического и физического здоровья населения. Проблема РПП связана с такими актуальными научными

направлениями, как психология, медицина и социология, и отражает общие тенденции глобализации, изменений социальных норм и цифровизации. Практическая значимость темы проявляется в необходимости разработки профилактических программ, повышения уровня диагностики и адаптации терапевтических подходов к культурным особенностям, что особенно актуально для Казахстана. Обеспечение квалифицированной помощи женщинам с РПП также способствует улучшению общественного здоровья и качеству жизни населения.

Объект

Объектом исследования в данной статье являются нарушения пищевого поведения у женщин.

Предмет

В качестве предмета исследования выступают факторы, причины и особенности развития расстройств пищевого поведения у женщин в Казахстане и в мировом контексте, а также подходы к диагностике, лечению и профилактике этих расстройств.

Цели и задачи исследования

Ключевая цель статьи - проанализировать основные причины, факторы и последствия нарушений пищевого поведения у женщин в Казахстане и мире, а также рассмотреть подходы к их диагностике, лечению и профилактике.

Учитывая данную цель, можно определить такие задачи исследования как:

1. Изучить основные виды расстройств пищевого поведения и их особенности у женщин.
2. Провести анализ факторов, влияющих на развитие расстройств пищевого поведения в Казахстане и за рубежом.
3. Рассмотреть влияние культурных и социальных аспектов на формирование пищевого поведения у женщин.
4. Оценить современные методы диагностики и лечения расстройств пищевого поведения.
5. Исследовать эффективные подходы к профилактике расстройств пищевого поведения, учитывающие специфику Казахстана.

Методы

В данной обзорной статье использован метод теоретического анализа научной литературы, направленный на систематизацию и обобщение существующих данных по теме расстройств пищевого поведения у женщин. По этой причине, были детально изучены современные исследования, статистические отчёты и статьи, что позволило выявить ключевые факторы, причины, последствия и подходы к лечению и профилактике.

Практическая значимость исследования

Практическая значимость исследования заключается в его потенциальном вкладе в улучшение системы профилактики и лечения расстройств пищевого поведения (РПП) у женщин в Казахстане. Обзор существующих методов диагностики и лечения может быть полезен для специалистов в области медицины и психологии, предлагая эффективные подходы, адаптированные к культурным и социальным особенностям. Полученные данные также могут использоваться для разработки информационно-просветительских программ, направленных на повышение осведомленности о РПП среди населения и снижение стигмы, связанной с обращением за помощью. Внедрение практических рекомендаций из исследования способно улучшить качество жизни женщин, подверженных риску РПП, и повысить уровень общественного здоровья.

Материалы и методы

Как было упомянуто выше, для статьи был выбран метод теоретического анализа научной литературы, который позволяет систематически исследовать и обобщать существующие знания по теме расстройств пищевого поведения (РПП) у женщин. Данный метод включает в себя несколько ключевых этапов, направленных на глубокое понимание проблемы и выявление её основных аспектов.

На первом этапе проводился поиск и отбор релевантных научных статей, отчетов, монографий и других источников, посвященных РПП. Использовались базы данных, такие как Google Scholar, PubMed и ResearchGate, что обеспечивало широкий доступ к международным исследованиям. Отбор публикаций проводился по критериям актуальности, значимости и качества исследования, а также по данным, связанным с культурными и социальными аспектами, влияющими на пищевое поведение женщин в Казахстане и других странах.

Вторым этапом являлось критическое осмысление и анализ выбранных источников. На этом этапе выявлялись основные тенденции, факторы риска и последствия РПП, а также оценивались существующие методы их диагностики и лечения. Особое внимание уделялось различиям в проявлениях РПП в различных культурных контекстах, что позволяло глубже понять специфику проблемы.

Затем проводился синтез полученных данных, что позволяло сформировать целостную картину состояния изученности РПП. На основе анализа выявлялись пробелы в исследованиях, что подчеркивало необходимость дальнейших научных изысканий в этой области.

Таким образом, выбранный метод теоретического анализа научной литературы позволил не только обобщить существующие знания о РПП, но и выделить ключевые аспекты, требующие дополнительного внимания исследователей, что делает данное исследование актуальным и значимым для практики.

Основные положения

Как правило, расстройства пищевого поведения (РПП) представляют собой сложные психические расстройства, которые затрагивают значительное число женщин во всем мире. Эти расстройства, включая анорексию, булимию и компульсивное переедание, имеют многообразные причины и последствия, которые требуют детального анализа. Важным аспектом исследования является понимание того, как культурные и социальные факторы влияют на пищевое поведение, особенно в контексте Казахстана, где традиции и современные реалии могут существенно различаться.

Первое важное положение исследования касается определения и классификации основных видов РПП. Анорексия и булимия наиболее часто изучаются в научной литературе, но компульсивное переедание, часто остающееся в тени, также представляет значительную опасность для здоровья женщин. Эти расстройства могут проявляться в разных формах и иметь уникальные клинические характеристики, что подчеркивает необходимость дифференцированного подхода к диагностике и лечению [10].

Второе положение касается факторов риска, способствующих развитию РПП. Социальное давление, стремление соответствовать идеалам красоты, распространённые через медиа и социальные сети, оказывают негативное влияние на восприятие собственного тела и пищевого поведения у женщин. Исследования показывают, что в Казахстане, как и в других странах, идеалы красоты могут варьироваться, что создает дополнительные сложности для женщин, сталкивающихся с НПП [11].

Третье положение исследования касается последствий РПП для здоровья. Эти расстройства могут вызывать серьёзные физические и психические проблемы, включая

сердечно-сосудистые заболевания, нарушения обмена веществ и депрессию. Также важно отметить, что РПП не только влияют на женщин, страдающих ими, но и оказывают негативное воздействие на их семьи и общество в целом [12].

Четвертое положение связано с методами диагностики и лечения РПП. Несмотря на наличие разработанных терапевтических подходов, таких как когнитивно-поведенческая терапия, в Казахстане остаются пробелы в доступности квалифицированной помощи и специализированных программ лечения. Необходимость адаптации международных практик к местным условиям также является важным аспектом [13].

Наконец, исследование подчеркивает значимость профилактики РПП. Образовательные и информационные программы, направленные на повышение осведомленности о пищевых расстройствах и формирование здоровых привычек, могут существенно снизить риск их возникновения среди женщин. Учитывая вышеизложенные положения, необходимо продолжать изучение проблемы РПП и разрабатывать комплексные подходы к её решению, чтобы улучшить качество жизни женщин и обеспечить их здоровье в долгосрочной перспективе [14].

Обзор литературы

Расстройства пищевого поведения (РПП) являются одной из актуальных проблем психического здоровья, затрагивающей миллионы женщин по всему миру. Исследования показывают, что такие расстройства, как анорексия, булимия и компульсивное переедание, имеют многообразные причины и последствия, требующие комплексного изучения.

Основные виды РПП, описанные в литературе, включают анорексию, характеризующуюся резким снижением массы тела и искажением восприятия своего тела, а также булимию, при которой наблюдаются эпизоды переедания, за которыми следуют очистительные действия. Компульсивное переедание проявляется в постоянном потреблении пищи без чувства голода и может приводить к ожирению и связанным с ним проблемам со здоровьем [15]. Важным аспектом этих расстройств является то, что они часто сосуществуют с другими психическими заболеваниями, такими как депрессия и тревожные расстройства, что делает их лечение более сложным [16, 17] (Рисунок 1).



Рисунок 1 – Виды РПП [16, 17]

Среди факторов, способствующих развитию РПП, исследователи выделяют как биологические, так и психологические аспекты. Генетическая предрасположенность играет значительную роль в возникновении этих расстройств, поскольку женщины с семейной историей РПП более подвержены риску их развития [18]. Психологические факторы, такие как низкая самооценка, перфекционизм и высокий уровень тревожности, также считаются значимыми предикторами РПП [19].

Социальное окружение и культурные нормы влияют на формирование пищевого поведения и восприятие собственного тела. Исследования показывают, что идеалы красоты, навязанные медиа и рекламой, могут оказывать давление на женщин, заставляя их стремиться к недостижимым стандартам [20]. В Казахстане, где культурные нормы могут варьироваться, влияние традиционных и современных представлений о красоте также требует отдельного внимания. Литература указывает на необходимость изучения локальных факторов, влияющих на РПП, чтобы лучше понять, как культурные контексты могут формировать пищевое поведение женщин [21, 22] (Рисунок 1).



Рисунок 1 – Факторы, способствующие развитию РПП [20, 21, 22]

Научные исследования подтверждают, что РПП могут иметь серьёзные последствия для физического и психического здоровья. Они могут приводить к разнообразным осложнениям, включая сердечно-сосудистые заболевания, нарушения обмена веществ и психические расстройства, такие как депрессия и тревога [23]. Более того, высокие уровни смертности среди женщин с РПП подчеркивают важность своевременной диагностики и лечения.

Методы диагностики РПП разнообразны и включают клинические интервью, стандартизированные анкеты и оценочные шкалы, такие как Eating Disorder Examination (EDE) и Eating Attitudes Test (EAT) [24, 25]. Современные подходы к лечению РПП варьируются от психотерапии до медикаментозного лечения. Когнитивно-поведенческая терапия (КПТ) зарекомендовала себя как один из наиболее эффективных методов лечения, позволяющий изменять негативные мысли и поведение, связанные с пищевыми расстройствами [26]. Однако доступность качественной помощи и специализированных программ в Казахстане остается ограниченной, что подчеркивает необходимость адаптации международных практик к местным условиям [27].

Профилактика РПП играет ключевую роль в снижении их распространённости. Образовательные программы, направленные на повышение осведомленности о РПП и формирование здоровых привычек, могут существенно снизить риск их возникновения среди женщин. Исследования показывают, что вмешательства на уровне сообщества, направленные на изменение восприятия тела и распространение информации о здоровом питании, оказывают положительное влияние на уровень РПП [28, 29].

В заключение литература по проблеме РПП у женщин подчеркивает многогранность этой темы и необходимость комплексного подхода к её изучению. Необходимость дальнейших исследований, направленных на анализ влияния культурных факторов и разработку эффективных методов профилактики и лечения, становится очевидной [30]. Эти исследования могут внести значительный вклад в повышение осведомленности о РПП и улучшение здоровья женщин в Казахстане и за его пределами.

Результаты и обсуждение

Исследование, посвященное расстройствам пищевого поведения (РПП) у женщин в Казахстане и в мире, привело к ряду значимых результатов, которые подчеркивают сложность и многогранность этой проблемы. На основании анализа научной литературы, статистических данных и существующих программ профилактики и лечения, были выделены ключевые аспекты, касающиеся различных видов РПП, их факторов риска, последствий и методов интервенции.

Результат 1 - На первом этапе исследования была проведена систематизация основных видов РПП, включая анорексию, булимию и компульсивное переедание.

Каждый из этих видов расстройств имеет свои уникальные клинические характеристики и требует индивидуального подхода к диагностике и лечению. Например, анорексия проявляется в значительной потере веса и искажении восприятия своего тела, в то время как булимия включает циклы переедания и последующих очистительных действий. Компульсивное переедание, в свою очередь, связано с отсутствием контроля над потреблением пищи и может приводить к ожирению и сопутствующим заболеваниям.

Результат 2 - В ходе исследования было выявлено, что на развитие РПП влияют как биологические, так и психологические факторы.

Генетическая предрасположенность, а также наличие сопутствующих психических расстройств, таких как тревожность и депрессия, значительно увеличивают риск возникновения РПП. Психологические факторы, включая низкую самооценку и перфекционизм, также играют важную роль. Социальное давление, обусловленное современными стандартами красоты и идеалами, навязываемыми медиа, оказывает негативное воздействие на женщин, заставляя их стремиться к недостижимым целям.

Результат 3 - Культурные аспекты также являются важным элементом, влияющим на пищевое поведение.

В Казахстане, где традиции и современные ценности сосуществуют, могут возникать уникальные вызовы. Литература подчеркивает необходимость изучения локальных факторов, таких как традиционные представления о красоте и роли женщин в обществе, чтобы лучше понять, как они формируют пищевое поведение. Например, в контексте казахстанской культуры женщины могут испытывать давление из-за ожиданий, связанных с соблюдением традиционных стандартов внешности и поведения.

Результат 4 - Последствия РПП имеют серьезные физические и психические последствия.

В результате нарушения пищевого поведения могут развиваться сердечно-сосудистые заболевания, остеопороз, нарушения обмена веществ и другие медицинские проблемы. Психологические последствия также значительны, включая повышение уровня

депрессии, тревожности и социальной изоляции. Результаты исследования показывают, что женщины, страдающие РПП, часто сталкиваются с трудностями в социальных взаимодействиях и могут испытывать стыд и вину за свое состояние, что усугубляет их страдания.

Результат 5 - Анализ существующих методов диагностики и лечения РПП выявил, что несмотря на наличие различных подходов, доступность специализированной помощи остается ограниченной.

Наиболее распространенные методы диагностики включают клинические интервью и стандартизированные шкалы, такие как Eating Disorder Examination (EDE). Лечение РПП часто включает когнитивно-поведенческую терапию (КПТ), которая показала высокую эффективность в изменении деструктивных паттернов мышления и поведения. Однако, в Казахстане существует необходимость адаптации международных практик к локальным условиям. Разработка специализированных программ лечения и обучение специалистов в области психического здоровья могут значительно улучшить ситуацию с диагностикой и лечением РПП.

Результат 6 - Исследование также подчеркнуло важность профилактических мер.

Образовательные программы, направленные на повышение осведомленности о РПП и формирование здоровых привычек, могут играть ключевую роль в снижении их распространенности. Внедрение программ на уровне сообщества, которые учитывают культурные особенности и проблемы, может быть эффективным инструментом в борьбе с РПП.

В целом, результаты исследования подтверждают, что проблемы расстройств пищевого поведения у женщин являются сложной и многоуровневой проблемой, требующей комплексного подхода. Необходимость дальнейших исследований, направленных на понимание культурных факторов и разработку эффективных методов профилактики и лечения, становится очевидной. Это позволит не только повысить уровень осведомленности о РПП, но и улучшить качество жизни женщин, подверженных риску этих расстройств, как в Казахстане, так и в мире.

Заключение

Анализ расстройств пищевого поведения (РПП) у женщин в Казахстане и в мире выявило множество аспектов, подчеркивающих сложность этой проблемы. Как следует из выводов статьи, РПП оказывают значительное влияние на здоровье и качество жизни женщин, что требует более глубокого понимания и эффективных подходов к диагностике и лечению.

Обоснованность выбора темы исследования обусловлена растущей распространенностью РПП и их серьезными последствиями для физического и психического здоровья. Важно отметить, что на развитие этих расстройств влияют как биологические, так и психологические факторы, включая генетическую предрасположенность, уровень самооценки и социальное давление. В частности, медийные идеалы красоты создают нереалистичные стандарты, что особенно актуально в контексте казахстанского общества, где традиционные и современные представления о женской красоте переплетаются.

Результаты данной статьи подчеркивают необходимость адаптации методов лечения и профилактики РПП к локальным условиям. Доступ к качественным медицинским и психологическим услугам остается ограниченным, что требует активных усилий со стороны государства и общества. Программы профилактики, направленные на повышение осведомленности о РПП и формирование здоровых пищевых привычек, могут существенно снизить риск возникновения этих расстройств.

Становится очевидным, что необходимы дальнейшие исследования, направленные на изучение влияния культурных, социальных и экономических факторов на развитие РПП, а также разработка и внедрение эффективных программ профилактики и лечения. Повышение осведомленности и понимание РПП не только улучшит качество жизни женщин, но и создаст более здоровое общество в целом.

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Philological Sciences

Comparative classification of coordinating sentences in the English and Azerbaijani languages

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Açar sözlər: *Tabesiz mürəkkəb cümlə, sadə cümlə, bağlayıcı, tərkib hissə, intonasiya*

Key words: *Compound sentence, simple sentence, conjunction, constituent part, intonation*

Language is the most important means of communication between people. Knowing a foreign language is very necessary in our modern and globalized world. It is not for nothing that they say that the more languages you know, the more you are a person. Today, our youth, who understand the importance of this, are eager to learn more languages. Since sentences are the most optimal means of communication in every language, it is important to examine them as the main communicative unit and classify them according to their meaning and structure.

Since the classification of the sentence according to its structure has a dominant character, excluding word combinations, the science of syntax deals with the study of the structural features of the sentence from beginning to end. The sentence structure is simple and compound.

A simple sentence is formed from words, word combinations, and a compound sentence is formed from simple sentences. A simple sentence has one predicative center, and a compound sentence has two or more predicative centers. Since the components of a compound sentence do not have meaning independence, intonation exhaustion, it is not considered a sentence or is conditionally called a "sentence".

A simple sentence is the most common means of communication and exchange of ideas, and it is used more in the language than other types of sentences. Such sentences with a special structural scheme, intonation and modality, carry the necessary meaning.

A compound sentence differs from a simple sentence in terms of structure and meaning. When simple sentences are combined into a compound sentence, along with structural change, semantic richness and compounds are created.

Compound sentences also differ according to their structure and are divided into two types: compound sentences with a simple structure; compound sentences of mixed type (compound).

In English, a similar classification is made when talking about the types of sentences according to their structure. Thus, according to their structure, sentences are divided into two groups: simple and composite. Sentences with a predicative center are called simple sentences. For example: *There are six continents in the world.*

Simple sentences in a compound sentence are syntactically connected in two ways: by coordinating and subordinating relationships.

1. Simple sentences connected by the relation of coordination are equal, that is, they are not grammatically dependent on each other. Compound sentences are formed by the

combination of such sentences. For instance, *Professor gəldi, iştirakçılar ayağa qalxdılar. Köhnə il sona çatır, yeni il yeni ümidlərlə gəlir* and so on.

2. Simple sentences connected by the relation of subordination are not equal: one of the components is grammatically independent, and the other is dependent on it. Subordinate compound sentences are formed from the combination of such sentences. For example: *Qoca dənizçi anladı ki, artıq onun vaxtı bitib. Onlar əzəldən bilirdilər ki, onları çətin yollar gözləyir.*

The simple sentences in these compound sentences are grammatically independent, and the second ones are dependent on them. The second simple sentences clarify and complete the first ones. Such a connection between simple sentences in a compound sentence is a subordinating relationship. Such compound sentences are called subordinating compound sentences.

Therefore, compound sentences are divided into two types according to the syntactic relationship between the simple sentences that make them up: coordinating compound sentences and subordinating compound sentences.

As compound sentences are divided into two groups in our native language (compound sentences with subordinate clauses, compound sentences without subordinate clauses), similar classification is used in English. Thus, in English, compound sentences are grouped by being independent (compound sentences) and subordinate (compound sentences).

The constituent parts of compound sentences are connected with each other by different semantic relations. The meaning connections that we will show below are created either with the help of subordinating conjunctions or enumerative intonation. From this point of view, compound sentences without subordinates are divided into two groups: compound sentences without subordinate clauses, compound sentences with subordinate clauses.

Compound sentences with conjunctions

The constituent parts of compound sentences with a coordinate clause are mainly connected with the help of the following conjunctions:

Connecting conjunction: *Və* For example: *Qoşunlar uzaq tapalardan göründü və şəhər əhalisi bundan təşvişə düşdü. Güclü qar yağdı və sobada odunlar közəirdi.*

Copulative conjunctions: *həm...həm də, da, də.* For example: *Mətbuatda məsələ həm açıqlandı, həm də ictimaiyyətin ciddi müzakirəsinə cəlb edildi.*

Adversative conjunctions: *Amma, ancaq, lakin, fəqət.* For example: *Məsələ müzakirə edildi, lakin nümayəndə heyəti heç bir razılığa gələ bilmədi. Bütün baş verənlər anaya ciddi təsir göstərdi, fəqət o, öz ciddiliyini qoruyub saxlaya bildi.*

Negative conjunctions: *nə....nə də (ki).* For example: *Şagird nə müəllimin sualına cavab verdi, nə də müəllim bunun səbəbini anlaya bildi.*

Disjunctive conjunctions: *ya, ya da (ki), gah, gah da.* For example: *Dostlar ya məsələni kökündən həll etməli idi, ya da hər kəs onların səhv addım atdığı qənaətinə gəlməli idi. Gah yağış yağır, gah da günəş buludların arxasından boylanırdı.*

Unlike the connecting conjunctions, a comma is placed between the components of coordinate compound sentences formed with the participation of the remaining conjunctions.

Coordinate compound sentences without conjunctions

The components of unconjugated coordinate compound sentences are connected to each other only by enumerative intonation. A comma is placed between the components of such coordinate compound sentences. For example: *Durnalar qatar-qatar uzaq ellərə uçub gedir, payızın xəfif yelləri əsirdi.*

The following semantic relations exist between the components of coordinating sentences: the relation of time, the relation of sequence, the relation of cause-effect, the relation of clarification, the relation of comparison, the relation of distribution.

In time-related coordinating clauses, events that occur simultaneously are listed, in other words, the work, action, and event in the constituent parts of such sentences occur at the same time. For example: *Natiq nitqini söyləyir, auditoriyadakı dinləyicilər diqqətlə ona qulaq asırdılar. Nə ana bir kəlmə danışdı, nə də oğlu onun bu susqunluğunu pozurdu.*

As can be seen from the examples, the constituent parts of time-related coordinate clauses can be connected either only with enumerative intonation (as in the first sentence) or with intonation and coordinating conjunctions. (as in the second and third sentences).

In sequence-related coordinate clauses, events that occur in a certain sequence are listed. For example: *Zəng vuruldu, qapılar bağlandı, dərs başlandı.* As it is seen from the example the constituent parts of sequence-related coordinating clauses are more often connected with enumerative intonation. With the participation of the conjunction, the coordinating compound sentences with a sequence relationship are also formed. For example: *Tamaşaçılar salona toplaşdı və tamaşa başlandı.*

In the coordinating compound sentences with a cause-effect relationship, the action in the first component is the cause, and in the second it is its effect. For example: *Güclü külək əsir, ağaclar qızılı yarpaqlarını tökürdü.*

The components of the coordinating compound sentences with a cause-effect relationship are also connected by intonation and coordinating conjunctions.

But it must be noted that coordinating compound sentences with a cause-effect relationship are similar to those with a sequence relationship. In both kinds of these compound sentences, the action is performed in a certain sequence. However, in the coordinating compound sentences with a cause-effect relationship, there is a spontaneity and a direct causal content, that is, the action in the second sentence occurs because of the cause in the first sentence.

In coordinating compound sentences with a clarifying relationship, one of the components (usually the second) clarifies the idea in the other. For example: *Uşaq qaş-qabağını tökmüşdü, kim isə əhvalına soğan doğramışdı.* The second component in these compound sentences clarify the idea in the first. A comma is usually placed between the components of the coordinating compound sentences with a clarifying relationship. The components of such kinds of compound sentences are mainly connected by intonation.

The work or event in the components of adversative compound sentences is contrasted with each other. For example: *Mən öz ölkəmizdə təhsil alıram, lakin qardaşım xarici universitetlərdən birində oxuyur.*

The components of coordinating compound sentences with a comparison relationship are connected with the help of intonation, adversative conjunctions (*amma, ancaq, lakin, fəqət, isə*) and antonyms.

The actions and events in the components of coordinating compound sentences with disjunctive relationship either replace one another in turn, or the possibility of only one of them is indicated. For example: *Bu çempionatda ya komanda qalib gəlməli idi, ya da məşqçi istefa verib yerini gənclərə təhvil verməli idi.*

This type of compound sentences is formed with the help of disjunctive conjunctions.

In English, a coordinating composite sentence is called a Compound Sentence. The simple sentences in such sentences being completely independent, did not depend on the other. These components are called Independent Clauses. They act as the subject, action, and complete thought carrier of each simple sentence. These components are connected to each other a) by means of a conjunction or b) without a conjunction, through punctuation marks. For example,

a) *He wants to go to the city and I prefer to stay in the village.*

The children were exhausted, but their parents made them continue hiking.

b) *The lesson was over, all the students left the classroom.*

In English, the following semantic relationships exist between the components of coordinating compound sentences:

1. Copulative coordination

Such sentences are connected to each other by means of the conjunctions *and, nor, neither nor, not only but also*. For example: *It was a fine summer day and we went to the beach. This is not the main reason, nor is it the most important etc.*

Compound sentences with coordinating conjunctions can also be connected to each other without a conjunction. For example, *Mr. Darcy followed all the rules, his employees did their best, all these efforts were approved.*

2. Disjunctive coordination.

The constituent parts of such sentences are connected by means of the conjunctions *as, else, or else, either or, otherwise*. For example,

All the suggestions must be turned down, otherwise the firm would not be able to complete the task on time. Either you must meet all the demands or we will have to fire you.

3. Contrastive compound sentences with coordinating conjunctions. (Adversative coordination)

These sentences are connected with the conjunctions *but, only, whereas, yet, nevertheless* which creates a contrasting meaning between the constituent parts. For example,

The exam itself is not difficult, whereas the required score is too high.

She did her best all year in order to enter the university yet the result was a failure.

4. Causative-consecutive compound sentences. (Causative-consecutive coordination). These sentences are connected with the conjunctions *for, therefore, hence, so, consequently*, and express cause and effect.

The teacher has plenty of expectations for her students' achievement, so she is quite happy to be awarded. I missed the bus therefore I was late for the lesson.

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ECONOMIC DISCOURSE OF KAZAKHSTAN NEWSPAPERS IN THE SEMANTIC FIELD OF DISCOURSIVITY

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Abstract. This article examines the economic discourse of newspapers in Kazakhstan in the semantic field of discursivity. The status of the category of deprivation as part of the semantic category is defined and substantiated; the range of verbs with the semantics of deprivation is analyzed, as well as other language units capable of conveying the semantics of deprivation; participants in discursive situations associated with the action of deprivation are identified; the degree of identity of perception of the semantics of deprivation in the economic discourse of the Republic of Kazakhstan, its influence on the addressee in Kazakhstani society is established.

Key words: Economic discourse, definitions, localizations, determination of discourse, social life, negotiations, contextuality, phenomenon.

The market conditions in which the economy of Kazakhstan found itself after the era of stagnation divided society into unequal groups in material and social terms. These differences provoke different views on the current state of affairs in the state economy and in the economic environment as a whole, giving rise to a problem. Entering into negotiations with each other, representatives of opposition groups put forward their arguments in favor of the position they have designated and thus participate in the formation of economic discourse. The sphere of economics, which directly influences social life as a whole, is one of the dominant zones of representation of newspaper materials in the Republic of Kazakhstan. Moreover, special economic newspapers published in the country are devoted to it. In the era of instability, the global economic crisis and certain economic troubles of our time, this aspect of human life is especially relevant.

As E.Yu. rightly notes. Makhnitskaya, the sphere of economics is served by the “sublanguage of economics”, which is understood as “a set of linguistic units represented in a limited array of texts of economic discourse”. In addition to scientific texts, economic discourse, as the scientist rightly notes, also includes popular science, journalistic, and oral texts “reflecting economic practice” [1, p. 203], which justifies our appeal to the language of economic newspapers.

The subject field of economic discourse, limited to the sphere of economics, however, does not exhaust the problem of discourse as a terminological phenomenon. The multitude of points of view on discourse, represented by a variety of definitions, taking into account a certain degree of error, can be reduced to two positions of scientists, which at the same time contain points of intersection.

The first position is reduced to the interpretation of discourse as the so-called “live broadcast”. Thus, I.T. Kasavin defines discourse as “an unfinished living text, taken at the moment

of its direct inclusion in the act of communication, in the course of its interaction with the context." [2, p. 362] As we can see, in this case the main features of discourse are incompleteness, the immediacy of localization in time, contextuality. On this basis, "the writing process itself is discourse," since it is "not completed and is associated with the author." [2, p. 362]

In his interpretation of discourse, I. T. Kasavin relies on the Apel-Habermas theory, the essence of which is as follows: discourse presupposes a dispute, during which its participants seek to resolve the conflict by substantiating their own position. Since the substantiations must be devoid of an ordinary nature, discourse in this sense is interpreted as a "process of demanding argumentation," and its goal is mutual understanding in the form of consensus or dissensus, which in one way or another contribute to progress in resolving the conflict. [2, p. 357] According to the stated position, discourse presupposes a lively dialogue (polylogue) in the form of a dispute accompanied by a certain argumentation. Such an approach to discourse seems, however, somewhat narrow. In particular, the so-called sign of "liveness" of discourse, due to which texts created in different periods of time and recorded in writing for subsequent eras remain outside, is controversial, in our opinion. It is no coincidence that I. T. Kasavin, relying on the definition of E. Benveniste, reduces the linguistic meaning of discourse to a pragmatically oriented text. [2, p. 361] The pragmatic nature of discursive activity determines the validity of the term "pragmeme", with which scientists associate "words with a pragmatic component of meaning". Unlike informemes, pragmemes not only reflect reality, but also express a personal attitude towards it by selecting "optimal means of actualizing the knowledge of listeners" with the aim of influencing this knowledge. [1, p. 204] Among the parametric data of discourse, I. T. Kasavin singles out the parameter "historical era", which assumes the cultural qualification of each era "from the point of view of accepted standards of reading". [2, p. 363] These indicators of pragmatic orientation and historicity bring the stated position closer to the second point of view of scientists on discourse.

The second position on discourse is associated primarily with the French school of discourse analysis, the founder of which is M. Pecheux, and representatives are M. Foucault, P. Serio, M. Laclau and others. In scientific sources, this theory is characterized as a historical-analytical formational approach to discourse. [2, p. 357] Defining discourse as a communicative activity, scholars of this school put forward a number of principles. The first of them is defined as historicity. Within the framework of this principle, M. Pecheux uses the term "discursivity", defined as "an ordered space of dispersion of the utterance". [3, p. 194] Historicity, according to the theory under consideration, presupposes the composition of discursive formations, represented by texts of the same subject, in a diachronic sequence. [3, p. 194] Scholars emphasize the historical determinism of discourse: "Language is meaning, and history produces meaning." [3, p. 202] The historicity of discourse is determined by the fact that "its production is carried out under certain conditions," it is projected into the "future," "creates tradition, the past, and influences current events." [3, p. 209] According to M. Foucault, discourse is a fragment of history that imposes its limitations on it. The scientist proceeds from the fact that there is an infinite number of statements that we never make, since their meaning would contradict the rules of discourse adopted by a certain historical era. [3] As an example that clearly illustrates this idea of the scientist, we can cite statements that lead to an intercultural and interethnic barrier in the post-Soviet period. The principle of historicity, according to scientists, determines the signification of subjectivity: "there is no discourse without a subject and there is no subject without ideology." The effect of discourse consists in the effect of the uniqueness of the subject and language. [3, p. 208] In other words, the production of speech is determined by the meanings produced by a given historical formation and in which the producer of discourse is socialized. As E. Yu. Makhnitskaya emphasizes, the pragmeme characteristic of discourse "always explicates the personal attitude of a specific individual to the content to which his activity is currently directed," and "the choice of a referent depends not so much on the meaning of the linguistic sign as on the attitude of the subject to

what is being displayed – on its vital meaning for the subject.” [1, p. 205] Proposing an interactive analysis of discourse, I. T. Kasavin brings the principle of subjectivity to the forefront; thereby, he emphasizes its dominant role in the communicative situation. According to the scientist, mastery of the communicative situation by the subject of speech allows the speaker to influence the listener, changing his views and behavior. [2, p. 194]

The uniformity of the scientists' point of view on the direction of discourse, first of all, not on information, but on influence with the aim of changing the opinion on a certain phenomenon and the social position of the influencing person as a whole, determines the dialogic nature of discourse. This principle is based on the general principle of speech activity - the presence of the "Other", which is an integral part of the speech of any communicative act and prevents the uncontrollability of the subject's speech. Developing the principle of dialogicity, dating back to the ideas of M.M. Bakhtin [4], Yu.M. Lotman proposes a model of the communicative system "I - HE", where HE is essentially equal to the "Other" and is the addressee of the communicative act. [5, p. 172]

The principle of paraphrase is based on the principle of historicity, which consists in taking into account the generation of meaning in a certain historical formation. Its essence is that with the help of paraphrase “one can observe the connection between different subjects within one discursive formation and the connection between different formations.” Paraphrase is defined as “a matrix in which one subject refers to another.” [3, p. 213] In our opinion, the principle of contextuality put forward by I. T. Kasavin is identical to this principle. The scientist reduces the essence of this principle to taking into account the flow of speech in the context of “what has already been said.” [2, p. 172] It is no coincidence that discourse is defined by scientists in the context of interdiscourse, which is a complex of discursive formations with a certain dominant. Memory of meaning plays a significant role in this case, since we use what already has meaning. [3, p. 211] Equally, the paraphrase nature of discourse refers to a set of texts, background knowledge and situational constructs on the basis of which it was formed within the framework of one subject field. It is no coincidence that T. A. van Dijk proposes a situation model, or, in other terminology, a situational model, as the main type of cognitive analysis of discourse processing. In the fair opinion of the scientist, it is based on the principle of subjectivism due to the fact that it is based not on abstract knowledge of mental models, but on the personal knowledge of the speaker, associated with his previous experience, his feelings and emotions. [6, p. 125] Naturally, however, the personal knowledge of the speaker is also formed in the sphere of a certain ideological attitude. According to M. Pecheux, discourse presupposes a connection between speech activity and ideology. [3, p. 198] The scientist emphasizes: “... words, expressions, sentences, etc. change meaning in accordance with the positions occupied by those who use them, i.e. they indicate the ideological formations into which they fit.” He introduces the concept of “discourse formations,” defined as “what can and should be said.” [3, p. 265] This substantiates the validity of the idea put forward by I.T. Kasavin's principle of ideologicity, the essence of which lies in identifying the ideas hidden in discourse. [2, p. 158]

The designated positions of scientists on the problem of discourse allow us to define discourse with a projection on the point of view of the French school of discourse analysis, whose scientists have developed a fairly clear theory of this phenomenon, excluding from it the vagueness and the possibility of identification with related concepts. Discourse is a speech activity in a certain historical formation, aimed at influencing the addressee in order to change his judgments and social behavior in favor of the producer of the speech (addresser). The product of this speech activity is the text. According to the unanimous opinion of researchers, the text, however, is not identical to discourse, which predetermines the distinction between these terms.

With all the variety of criteria for distinguishing between discourse and text, scientists agree that their difference lies primarily in the incompleteness of discourse. According to I.T.

According to Kasavin, the purpose of discourse is to include those who are not yet participating in it, gradually introducing them to the discussion or debate. [2, pp. 359-360] Discourse is the result of a combination of texts. In discursive activity, the participants of communication come to the fore. The text can be considered outside the field of view of its producer. In particular, deconstructivist, poststructuralist approaches in linguistics level the role of the author in the text as its producer. Text-centrism gives rise to the concept of "death of the author" in literary studies, which implies a focus on the text itself, regardless of the author as the producer of the text.

A significant difference between discourse and text is its dynamic nature as opposed to the static nature of the text. If discourse unfolds speech activity in time, then the text acts as its product.

The historicity and social determination of discourse determine the cultural approach to discourse analysis. T.A. van Dijk emphasizes the need to take into account presuppositional knowledge stored in the form of frames and scenarios in the memory of the native speaker. [6, p. 128]

According to the scientist's fair statement, the semantics of discourse depends entirely on the knowledge of the native speaker's world within a particular culture. [6, p. 129]

Cultural and sociological approaches to the analysis of newspaper discourse are significant for the subject field of any content, including economic. After all, the impact of the text on the recipient of information and its contextual perspective as a whole, that is, the implementation of the goal of the discourse, depend on the background content of the text, which is an important component of the discourse.

The economic discourse presented on the pages of newspapers of the Republic of Kazakhstan unites a set of discourses that touch upon problem areas of the country's economy. Ideas related to private and global problems of the economy and subject to argumentation are presented against the background of the modern historical era, when the country gained independence and became an independent state. This epochal event constitutes the historical and cultural background of the political and socio-economic development of Kazakhstan both in the first decade of the formation of the state and in the modern period of a certain level of stabilization of the economy and the economic course of the Government aimed at the industrialization of the country. The authors of the articles present their reasoned position taking into account the personal principle, in other words, taking into account the understanding of the economic topic that they touch upon. We have defined a broad approach to economic discourse. This includes newspaper materials on economic topics that are informative in nature. In our opinion, these materials, which do not explicate a specific economic problem, contain resources that implicitly contain a firm position of the author of the publication and an open opportunity to debate this position, providing one's own counterarguments. In addition, materials of this kind undoubtedly have an influencing force, since the main function of the media as a whole is reduced to it. The effectiveness of the analysis of newspaper materials conveying information about positive changes in the country's economy, as a discourse, is based on the principle of intensionality outlined by I. T. Kasavin, the essence of which lies in taking into account not only the conscious, but also the unconscious intentions of the subject of speech. [2] The latter are precisely capable of provoking disagreement and, moreover, a dispute accompanied by a set of arguments from the potential addressee.

Taking into account the stated principles of discourse analysis, we note that the nature of the economic discourse of newspapers of the Republic of Kazakhstan is determined by the following factors:

- a) the historical and cultural era of the country's independence;
- b) the ideological views of the newspaper;

c) the position of the speaker (in this case, the writer), forming the discourse, regarding the degree of economic independence of the country as a whole and private attempts to stabilize the economy; d) pragmemes used by the speaker and the degree of their ability to influence the reader;

d) openness of inclusion in the dialogue.

Economic discourse, along with political discourse, has a dominant position in the semantic field of discourses and has a perspective orientation. It is one of the levers of the movement of the economy along the right channel. And this is its spiritual contribution to the economic development of the country.

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POINTS OF DEVELOPMENT OF THE IMPERATIVE SENTENCE IN FRENCH

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Abstract

The article mainly elaborates imperative sentence, which is one of the types of simple sentence. It is noted that imperative sentences in French express command, prohibition, request, desire and are characterized by their structure and special intonation. Often, the message of the imperative sentence is used in the form of a command and a wish. The article also points out that imperative sentences have different meanings and nuances of processing. At the same time, it is shown that the command form serves to express requests, starting with harder and softer command tones.

Key words: imperative sentence, advice, request, prohibition, wish, condition, politeness, intonation

One of the most widespread definitions of a sentence in French is: "A sentence is a grammatically and semantically organized unit of speech with its own intonation and function." [3, p.283] Classification of sentences is considered in three main aspects: formal, semantic, functional. According to their functional criteria, sentences are divided as follows:

1. Indicative sentences (énonciative): *L'enfant parle.*
2. Interrogative sentences (interrogatives): *Bois- tu du café?*
3. Imperative sentences (impératif): *Silence! Entrez!* [2, p. 33]

The topic of our scientific article is the processing points of the imperative sentence, which are the functional aspects of the sentence [7]. Imperative sentences in French express command, prohibition, request, desire and are characterized by their structure and special intonation. Often, the message of the imperative sentence is used in the form of a command and a wish. For example: *Descends vite. Qu'il aille la chercher.* Sometimes in imperative sentences, predicate is used in future and near future tenses. In this case, intonation is especially important. For example: *Vous finirez ce travail pour six heures! Vous allez refaire ces exercices!*

The verb "vouloir" is used as an auxiliary verb of the command form and expresses a command: *Veut-tu te taire! Voulez-vous me laisser en paix!* [3, p.284-285]

N. Steinberg notes in his book "Grammaire française" that it is better to call the imperative sentence an inciting sentence, because it expresses advice, request, warning, not only a command. The imperative or independent wish form of the verb is characterized without the presence of the subject. For example:

Venez avec moi.

Qu'il vienne avec moi.

Ne parle pas, Repose-toi. (Rolland)

Que tout vive, que tout soit grand, large, puissant dans votre récit. (France)

The Imperative sentence can sometimes be used in the form of a transitive sentence in which the verb is used in the future tense, in which case it can be understood that it is a command form only from the intonation. For example: *Tu vas immédiatement remettre ta chemise, dit-elle. (Troyat)* [6, p.7-8]

The authors of the text "Grammaire explicite du français" explain the imperative form as follows: An imperative is the form of a verb. However, unlike the other forms of the verb, the form of the command is incomplete [5]. In French, the imperative form is not used with a personal pronoun and is used only in the third person:

- used when referring to the second person singular. For example: *Prends le temps de visiter la ville, elle en vaut en peine.*

- used when referring to the second person plural. For example: *Prenez le temps de visiter la ville, elle en vaut en peine.*

-Very rarely, if you are part of a group, the first person plural is used." Such a question arises, if we are talking about other people, then how can the form of command be processed? To express first and third person command forms, the wish form replaces the command form. For example: *Que je sois changé en pierre si je mens! (= je veux bien qu'on me change en pierre si je mens).*

Qu'il aille visiter la ville, elle en vaut la peine (=il faut qu'il prenne le temps de visiter la ville).

There are two forms of the imperative in French. Often used Impératif présent - imperative form in the present tense and Impérative passé - rarely used imperative form, formed from the present tense form of the verbs avoir and être and the adjectival form of the main verb.

Impérative présent - present imperative form is used when giving an order, making a request or expressing actions that will happen in the near future. For example: *Sers – moi à boire, s'il te plaît. Passez-moi ce livre, s'il vous plaît.*

Impérative présent is used to express actions after the time of conversation when events are happening in the near or far future. It induces some hardships while translating from English into French [1]. For example: *Revenez à 18 heures, ce sera fait. N'oublie pas d'aller chercher les enfants à l'école ce soir.*

Impérative passé - past tense command form, formed from the present tense of the verbs avoir and être and the adjectival form of the main verb. Events in the form of a past tense command must end in the future, and the sentence must be complete with a sentence or a time branch sentence. For example: *Soyez rentrés avant minuit. Tu peux aller à cette fête, mais surtout sois revenue avant que ton père (ne) rentre.*

In French, the imperative form has different meanings and nuances. Imperative mood serves to express requests, starting with harder and softer command tones. For example: *Descendez de là immédiatement! Ecoutez –moi, je t'en prie.*

The traditional form of command is a command or its opposite, a prohibition. For example: *Apprenez cette leçon mais ne faites pas les exercices.* In addition, the command image can also express the following shades of meaning:

Le conseil – advice. For example: *Sachez attendre, soyez patient, tout va s'arranger.*

Le souhait – Subjunctive. For example: *Passez un bon week-end. Soyez en forme lundi.*

La prière – request. For example: *Faites qu'il réussisse. Ayez pitié de nous !*

sentences with the verb vouloir expressing formal forms of politeness, especially used in writing. For example: *Veuillez trouver ci-joint le document que vous nous avez demandé. Veuillez agréer, Madame/Monsieur, l'expression de mes salutations distinguées.*

La condition – condition. For example: *Finis ton travail et tu pourras rejoindre tes copains (= si tu finis ton travail et tu pourras rejoindre tes copains).*

L'opposition/concession: opposition/concession. For example: *Criez, menacez, suppliez, nous ne reviendrons pas sur notre décision. (= même si vous criez, menacez, suppliez, nous ne reviendrons pas sur notre décision).*

Une vérité intemporelle, souvent sous la forme de proverbes : realities of uncertain time used in the form of proverbs. For example: *Travaillez, prenez de la peine, c'est le fonds qui manque le moins. Ne jouez pas avec le feu. Ne mettez pas tous vos œufs dans le même panier. Ne vendez*

pas la peau de l'ours avant de l'avoir tué. En avril, ne te découvre pas d'un fil, en mai, fais ce qu'il te plaît.

Despite the fact that the imperative form of the verb in French is used in three persons, there are a number of confusions in the structure and spelling of the imperative form. All the verbs of the first group and five verbs of the third group: Although the verbs couvrir, cueillir, offrir, ouvrir, souffrir take the suffix "s" in the present tense, they do not take the suffix "s" in the second person singular in the imperative form. For example:

Tu chantes bien - Chantes pour nous, s'il te plaît.

Tu couvres la porte – Couvre la porte à ton frère.

However, to improve the pronunciation, if the imperative pronouns "y" and "en" are connected to the verb with a hyphen, then the letter "s" is added to the end of the verb. For example:

Tu es toujours décidé à sortir ce soir? Eh bien, vas-y sans moi, je suis fatigué.

Tu as des difficultés à comprendre ? Parles-en au professeur.

As we know, in French, COD, COI, i.e. direct and indirect objects, are usually used at the beginning of the verb. If these objects act as pronouns in the form of a command, then these pronouns are used after the verb. For example:

Raconte à ton père ce que tu as fait – Raconte-le-lui.

Souvenez-vous des bons moments passés ensemble – Souvenez - vous-en.

However, in the negative form of the command form, those pronouns go in front of the verb. For example:

Ne dis pas à ton père ce que tu as fait – Ne le lui dis pas.

N'offrez jamais de fleurs aux personnes allergiques – Ne leur en offrez jamais.

Ne te regarde pas dans la glace sans arrêt.

The verb aller, used in the form of a command, is used verbally in the plural of the first and second person and does not have a precise meaning. In oral speech, this verb expresses a request in the form of a command, sometimes insistence and courage. For example:

Allez, dépêche-toi un peu, on va être en retard !

Allez, courage! Tu as presque fini l'exercice!

Allez, vous pouvez bien faire ça pour moi !

Allez, les enfants, soyez sages !

Other verbs, the imperative form of the verbs voir and dire, are not used in a clear sense in oral speech and are used according to the content. These verbs are used to emphasize the speech, to ask the interlocutor, to create a special emphasis in the speech. For example:

Voyons! Vous ne ferez pas cela!

Mais voyons, monsieur, calmez-vous!

Dis, tu sais ou est ton frère!

C'est joli ce truc, dis donc! (familier).

Non, mais dis, tu te crois ou ? (= tiens –toi mieux que ça, comporte –toi mieux: familier). [7, p.155-158]

Thus, although at first glance it seems easier to process the command form used in the three persons of the verb, we find out that there are different points of processing and the ability to express the command form of different verbs.

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EXPLORING ANGLICISMS: THE LINGUISTIC PRAGMATICS OF ENGLISH ARTICLE TITLES AMONG KAZAKHSTAN'S YOUTH

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Abstract: Newspaper article titles, as a conglomeration of intentions and a microcosm of linguistic cultural traditions, play a special role in promotional activities and text perception. The aim of our research is to study linguistic-cultural conflicts and trends of usage from a particular context. We made an attempt to research this issue and present the first results in exploring the problem. Our research is conducted in a secondary school in Kazakhstan. The research has focused on three ethnic groups of students that showed the highest use of English in their article title choice. Nowadays, the use and choice of English articles as the basis for communicative activity are relevant in a range of research-developed countries. This article discusses the use of English as a universal tool for ethnic-community identification while creating bilingual article titles. The audience brings about their language culture and a variety of communicative needs.

Keywords: Anglicism, bilingual education, article title, communicative need, bilingual academism, self-translation, collation information

ИЗУЧЕНИЕ АНГЛИЦИЗМОВ: ЛИНГВИСТИЧЕСКАЯ ПРАГМАТИКА НАЗВАНИЙ СТАТЕЙ НА АНГЛИЙСКОМ ЯЗЫКЕ СРЕДИ КАЗАХСТАНСКОЙ МОЛОДЕЖИ

Заголовки газетных статей представляют собой сочетание замыслов и лингвокультурных традиций, что делает их особенно значимыми в области рекламы и восприятия текста. В нашем исследовании мы стремимся понять, как лингвокультурные различия влияют на употребление языка в конкретном контексте. Мы провели анализ в средней школе Казахстана, сосредоточив внимание на трех этнических группах учащихся, которые наиболее часто использовали английский язык для выбора названий статей. В настоящее время использование и выбор англоязычных статей в качестве основы для коммуникации становятся все более актуальными в ряде научно развитых стран. В этой статье мы рассматриваем, как английский язык служит универсальным инструментом для идентификации этнической общности при создании двуязычных названий статей. Это позволяет аудитории глубже понять свою языковую культуру и разнообразные коммуникативные потребности.

Ключевые слова: англицизм, двуязычное образование, название статьи, коммуникативная потребность, двуязычный академизм, автоперевод, сопоставление информации.

АНГЛИЦИЗМДЕРДІ ЗЕРТТЕУ: ҚАЗАҚСТАН ЖАСТАР АРАСЫНДА АҒЫЛШЫН ТІЛІНДЕГІ МАҚАЛА ТАҚЫРЫПТАРЫНЫҢ ЛИНГВИСТИКАЛЫҚ ПРАГМАТИКАСЫ

Газет мақалаларының тақырып аттары оның мағынасы мен тілдік және мәдени дәстүрлердің үйлесімі болып табылады, бұл оларды жарнама және мәтінді қабылдау саласында ерекше маңызды етеді. Зерттеудің негізгі мақсаты тілдік-мәдени айырмашылықтардың белгілі бір контексте тілді қолдануға қалай әсер ететінін зерттеу. Біз мақала атауларын таңдау үшін ағылшын тілін жиі қолданатын оқушылардың үш этникалық

тобына назар аудара отырып, Қазақстанның орта мектебінде талдау жүргіздік. Қазіргі уақытта бірқатар ғылыми дамыған елдерде ағылшын тіліндегі мақалаларды коммуникация негізі ретінде пайдалану және таңдау өзекті бола түсуде. Бұл мақалада біз ағылшын тілінің екі тілді мақала атауларын жасауда этникалық қауымдастықты анықтаудың әмбебап құралы ретінде қалай қызмет ететінін қарастырамыз. Бұл аудиторияға өздерінің тіл мәдениеті мен әртүрлі қарым-қатынас қажеттіліктерін тереңірек түсінуге мүмкіндік береді.

Түйін сөздер: Англицизм, қос тілді білім беру, мақала тақырыбы, коммуникативті қажеттілік, қос тілді академиялық, автоаудару, ақпаратты салыстыру.

Beliefs about the global standing of languages and multilingualism in Kazakhstan are focal areas of this study. The data for this paper were generated during a semester-long English for Specific Academic Purposes class at a university in Kazakhstan, where the author had recently begun teaching. Having seen, over the course of several years teaching international students at universities, the surprising extent to which local students in diverse fields were unaware of the foreign elements in English, I began my first class by discussing English borrowings from Russian and Kazakh, employing as examples some of the papers that I had encouraged my students to write in order to make these phenomena of linguistic pragmatics and global diversity more visible [1].

Introduction

The students at this alma mater of the Kazakh President are aware that they have studied and continue to develop their English in a multilingual environment (Kazakh and Russian being the most spoken). Indeed, they realize the power and general global standing of their first and other languages, and freely bemoan that the Russian language system (grammar and vocabulary included) is more complex, but they tend to forget how to speak it and use it when in unfamiliar situations located in distant parts of the expansive Eurasian region and beyond. Such attitudes, of course, are typical of monolinguals, including native English speakers' use of borrowings, misspellings, and other diversifying linguistic quirks - a number of which are detailed in this paper. Indeed, because that is what interests me most, my argument is entirely pragmatic [2].

When discussing the scientific research objectives, it is worth noting that the objective area is predominantly based on scientific research by both domestic and international leading scientists in the field of deep study of the linguistic nature of an Anglicism. A scientific study was carried out on the objectives of gaining and analyzing data on exploring the use of Anglicisms in article titles and recommends the following: 1) To carry out a linguistic analysis of Anglicisms and determine the factors influencing the choice of Anglicisms in the matter of article titles and content. 2) To classify Anglicism categories and specify the representatives in the matter of the scientific article themes. 3) To find the similarities and define regularity in the use of Anglicisms as compared with the language-ethnic derivation of article titles and the author's age as the creator of the article heading. 4) To establish differences and significant aspects in the use of Anglicism categories while using English article titles among different age groups as authors of the scientific publication.

Methodology

Given the readership, the research must use a finely tailored tool bag of methods, emphasizing the qualitative aspects within the quantitative approach. Via this mixed methods approach, the objectives of the research will be met, resulting in the best representation and understanding of the entire phenomenon, taking into account the particular features of the youth of Kazakhstan, pragmatic appropriateness enforced through high ecological validity, all while demonstrating the ensuing speech genre. It is not really a data collection methods problem anymore, but an analysis and interpretation one.

The motor of this research will be the search to explore the identity and dynamics of language change, that of the specific medium in which these new phenomena appear – academic and scholarly article titles in print and online journals written in the second language with science

bases – and how the youth of Kazakhstan navigate these processes of English language vocabulary spread and the dynamics of intercultural communication in reference to their own speech community, which is divided by three languages. So the paper will be based on discussing the 'how' of such processes: mixed methods of bottom-up and top-down perceptual response, content analysis, and structural semantics, too.

This chapter introduces social and cultural change in the society of Kazakhstan, aware of the international influence of English, more specifically the basis of the research concerning the articles read by Kazakhstani university students. Kazakhstani students from five top universities were interviewed about articles and other possible English linguistic materials that contribute to finding a practical profusion of the use of the English language in their everyday life. The obtained data provided proof of the explanatory power of the model developed and supported the idea that the actual use of linguistics reveals various positioning strategies of individuals within Kazakhstan's current society.

Academic English is a variety of English that is necessary at colleges and universities. In academic English, we use technical or professional vocabulary, sentence structure, typically used "low information" and assumption sharing between the writer and the readers, expressions, and speech in place of more informal forms available in everyday English. Accordingly, teaching academic writing is considered an essential part of specifically taught English classes.

An article explores the linguistic pragmatics of the article titles constructed by the students majoring in English at the Department of East Languages. It is the result of the obvious word order problems happening in the students' article titles, which raises the need to address the issue at the level of the morphosyntax of article titles. This paper includes a definition of linguistic pragmatics, upon which the standards of English morphology can be built, as it had been developed for adult language, and it addresses the need to observe the standards of the English article titles to be created for international publication by non-native speakers of English so that their works are not dismissed and do not risk their academic image.

In our opinion, the difficulty that Kazakhstan-trained authors face in constructing article titles can be defined as a problem rooted in the linguistic pragmatics of the contracted professional discourse segment of the English language. The contracted quality of the English professional discourse 1) is something specific that often goes beyond morphosyntactic transformations based on the language's inner rules, and deformation of this segment may be related to the features of the remote language ethnicity types, and 2) is something that is mobile for easier morphosyntactic expression. The morphosyntax of the contracted professional English should have some minimum of distinctive features compared to grammatically accurate spoken English, at least at the standardized level published in the press or colleges and universities leaflets providing a range of appearances to be imitated.

English frequently appears in periodical titles in ways that attract a specific audience. Writers resort to English for periodical titles as an expression of the modern, progressive, and developed image of their print publication. That is not to say "Kazakhstani youth with their limited English command cannot express the same progressive and trendy editorial line or consumption patterns," as they "fill their websites with English text slogans, advertising, and article titles that look expeditious but signify nothing. This steep widening of the use of English, especially in trendy style magazine titles and headings, often sounds like a triumph, inadmissible and gratingly new. The use of English has occurred so instantaneously that at times the quality of English has turned out to be extremely undesirable." The present paper examines the ways English is used in article titles in a glossy monthly Kazakhstani lifestyle magazine intended for young, cosmopolitan women and Kazakhstani youth with aspirations for world fashion. English appears everywhere—in articles, features, and advertisements. The magazine broadly catalyzes a cultivated lifestyle and values. In addition to looking for significant ways in which English is used, discussions were also centered

upon the meanings of those article titles for readers. The analytical framework, therefore, focuses on the allocation of English article titles, which is designed with the power to overlook the current knowledge in this field. (Carter-Thomas and Rowley-Jolivet 2020)

In this chapter, we will provide a comprehensive overview of the nature of the phenomenon under examination, specifically the appearance and use of English article titles in the multilingual, multicultural country of Kazakhstan, which is situated in a geographical environment varying from the continental type to the steppe and mountain regions. This multi-ethnic character has permanently brought families of various ethnic groups together for interaction of cultures and languages. A rich history and diverse nature have inevitably left their mark on society, traditions, attitudes, and, of course, on the language situation in the country.

As is well known, to date, the question of the ratification of the main state language is a debatable subject in Kazakhstan. Without laying emphasis on it, it must be noted that the position of the English language, as well as in other parts of the world, is completely established. English is a leader among foreign languages, a language of the fields of science, technology, and business, encompassing a wide scope of cultures and communication, education, and upbringing, and is an important factor in international relations. It is used for mutual understanding and for the establishment of partnerships, as well as for the definition and maintenance of professional and scientific discussions. Most importantly, the use of English is well represented in newspapers and magazines delivered to various classes, segments, and groups of the people of the country, and this is done in the titling of article titles, which are an important source of attraction and information [3].

The higher education system of Kazakhstan has, over recent decades, gradually been reformed and modernized alongside the formation of a nationalized educational ideology touting topics and subjects as root disciplinary components signaling the philosophies of the state, citizens, and society at large. One byproduct of these transformations may be observed from the linguistic scope of the titles which simple English articles authors craft. Certain flourishing trends are readily seen associated with the total or partial inclusion of simple English in the titles of the articles. These have been punctually noted to encompass not only the usage of English, but its enriched integration with Kazakh, Russian, or both languages as well at the same time. First, the image of the title may take on a clearly regional or ethnic feel. Authors can invoke the cosmopolitan internationalism of current higher education within Kazakhstan's superdiverse societies by judiciously positioning themselves as giving prominence to attributes in either or both of the title languages. The appeal of Kazakh to Kazakhs can thereby be enhanced and could well lead to an increased number of citations, although it is of course self-evidently the case that English holds the most primacy and precedence. The official state language policy permeating quarters of the territories associated with the Eurasian Economic Union and Shanghai Cooperation Organization where necessary impetuses for the trend can become a focal point. [4].

The importance of addressing the functional use of English linguistic elements, in specific English article titles, especially in an international environment, has emerged to satisfy numerous vital user areas: sociolinguistics and pragmatics analysis. Foreign language educators and learners are highly interested in teaching and learning patterns and politeness routines because information on observed, prevalent practices that occur in textual English form is needed. Sociolinguistics makes the examination of overt English linguistic patterns likely by providing a logical derivation process for wording. Sound, thorough derivations that provide insights into underlying intentions clarify linguistic surprises and shocks elicited by the wider community. The findings provide evidence that expected characteristics can, in fact, be confirmed, making future pragmatics and language education work more profitable, allowing language real-time processing, transparent translatability, and conditional reliability knowledge domains. Furthermore, sociolinguistic analysis can provide very useful information for developers of statistical natural

language processing. Preliminary, simple cluster lookups or positive training data building, as well as the acquisition and adjustment of statistical models, are all potential areas that can benefit from awareness of linguistic properties [5].

Pragmatic Analysis of English Article Titles explores the cognitive-affective-pragmatic facets of English article titles. Pragmatics refers to both speaker meaning and utterance meaning and is about how language users use previous linguistic material, context, social awareness, and background knowledge to interpret and relate this to the particular utterance they are working on at a particular moment. The chapter begins by outlining the concept of a title and traces its development across genres. Further, this chapter maps out some factors since the pragmatic situation that an article goes in increases the complications that take place during the article title generation process. The following textual level appropriate meaning essential for a title is to be elaborated as well. The significance of various pragmatics also plays a specific role in the article's linguistic level: contextual, social, and cognitive constraints.

People create titles. A title serves an essential role, presenting the article's subject and content in a highly condensed and selective version. One of the most predictive priming experiments tested whether or not the words appearing in article titles and their highly frequent ability to prime concurrently recurring words constituted a unique reflection on lexical pragmatics. This tendency has drawn most of the researchers' attention, and it should also be remembered that article titles are mostly aimed at. It often happened that the articles requiring substantial lexical legerdemain already had better names. We are very interested in such titles because the majority of everyday society, requiring a better understanding of society even at a distant relative's visit, necessitates such distinctive article titles, which can be understood by everyone. We can accurately prophesy that great attention will also attract more than one-page articles when the overall society interacts with the professional community connected directly with linguistics [6.7].

The study examines an understudied area by exploring the linguistic pragmatics of English article titles' use in a non-native English context where English is seen as a second language and a foreign language. More specifically, through article titles' analysis, the study reflects the cultural context where there is a growing concern about the dominance of English as a world language. It explores the values, practices, and beliefs of youth in a former Soviet republic that has adopted a trilingual education model. Furthermore, within the sociolinguistic translanguaging framework, this study aims to respond to the call of decentering the native speaker and recognizing the ethnolinguistic repertoire of native and non-native English speakers by centering local voices, particularly youth that experience linguistic contact and variation on a daily basis and are likely to experience complicated and sometimes contradictory feelings about using English in their everyday life and, especially, in their article titles, an academic genre requiring high-register English.

Considering scholarly work on the topic, the findings of the study suggest that English article titles use is not a zero-sum game in youth academic article titles. That is, English predominance does not necessarily promise spaces' dominance; rather, pragmatically speaking, it allows enabling various social actions of expressing inclusivity, demonstrating humility and politeness, self-assertion, enabling implicit exclusion, and guaranteeing the silent carrier to negotiate and manage positions among the conversational parties regardless of their proficiency in English and the social power attached to their linguistic backgrounds. In fact, all topics of participants' articles that are supported by English article titles focus on Kazakh culture, academic and personal growth of different groups of stakeholders within the local educational context, and nation-building on different levels such as modernization of the country, creation of a positive image of Kazakhstan, and inculcating the Kazakh identity.

Another way to look at representing English involves situating titles within pragmatic parameters. When a young person chooses to talk about a movie and uses the English title, does

this choice represent a risk-taking behavior? Are the pragmatic strategies we might normally associate with using an Anglicism as complex as we would expect? Are alternate choices, such as the Russian translations, political statements?

The choices that the youth in this study make in their selection of article titles for the American Independent Films group can be seen as conscious decisions. In choosing to represent the film with an English rather than Russian article title, the young people in my study exhibit linguistic competence that suggests they are fully aware of the connotations of doing so. First, the film title is inherently tied to the content or quality of the film. These people have seen the film and have an idea of how it wants to be represented. Second, these young people are more than mere passive linguistic consumers; they translate course syllabi, listen to radio reports, and read comments from international online resources. I would never characterize these young people as having a gullible view of English as the gateway to rock and roll music. Indeed, from reading the essays on the accompanying movie analyses, it is incredibly clear that the youth have deeply held opinions and views that can only be generated after rigorous and sophisticated analysis.

This chapter investigates two case studies of local students' technical research volumes, published in national aggregate periodicals which feature English article titles. The chief chapter that demonstrates our innermost information about university students' research periodicals' investigation and results in research publication titles and English article titles is presented. We assume that the prevalence, as well as the syntax and semantics of English research publication titles, would innovate. In this research phase, a new possible domain will absorb English language study investigators, enrich the two cross-cut semantics debate amidst scholars in language, and offer pragmatic sub-source data for terminologists and phraseologists.

The readership has produced explanations of English article titles conveying the poor recognition of what the research volumes' content reveals about research papers' major timely trends. Impetuses are breaking bulleted listings and short videos; viewership schemas, users' influence, scientific situations, and labor and pro-harmonize positions; as well as availing and, more precisely understanding, public welfare projects and their renowned caprice. Despite the fact that, for instance, necessarily the high-frequency reader favors a misleading one-off incitement; a work video reveals bulimic tendencies; not solely repose-four-folds but also complex viewer needs. Surveillance enterprise relates to project effectiveness. These fee schedules will adjust how this bonus per audience reaches a brand.

When devising the title selection criteria, it is important to consider the overall expressive value of the suggested titles. Notably, journalist texts abide by certain regulations regarding the form and structure of the title, which is frequently laid bare in the use of set patterns. There are several criteria for the selection of proper article titles in addition to the notions briefly discussed on title length, title core, style being logical, and brevity. Besides, article titles must reveal content, purpose or subject, contain essence and emphasis, form the unity of all title components, form utter sheen, be expressive, and correlate with the material aspect [8].

To this, I would add that while searching for a snappy and informative article or essay title, special attention must be paid to the pragmatic aspect of the language items being used. Thus, titles should contain some aspect of the author's subjective mental and emotional reflection of the problem being discussed and develop the expressiveness and emotional attractiveness of the text being used. The article title should, first and foremost, engage with the lexicon that has been accepted within texts of the particular genre. Additionally, the title should burden neither the writer nor the reader with an extensive length and must be representative of linguistic traps.

For the purpose of our research, we relied on a combination of quantitative and qualitative methods. Data collection began with a survey of the students' motivation for understanding English as it manifests itself in Kazakhstan, the means they make use of in response to these issues, and the specific linguistic responses that occur in response to language development. An analysis

revealed that one form of response by some to learning English is starting to see things in English. So we were specifically interested in when individuals title text in English for Kazakhstan's youth and what their beliefs are behind this practice. We concentrated specifically on the English titles of student seminar papers. A later part of our research consists of qualitative research with populations that have this practice. Interviews were conducted with those from the student population observed who added English titles to their seminar papers [9].

The survey of students took place in three separate groups: fourth-year students mainly majoring in PR; third-year students mostly majoring in schools; and first-year students, including those that will major in graphic design and sociology. The students had all taken their final language exams and had remained in the chosen Kazakh university. Data were collected on specifically formulated questions from their answers in a constructed response format. The data collection instrument was specifically designed to assess students' motivation, means, and forms of usage for understanding English as it manifests itself in Kazakhstan, as well as their perceptions of the role English plays in their country's future. It was administered by the author of this research [10].

Findings and Discussion

The Main Findings Here lies the reiteration of the findings extracted from 120 article titles taken from the participants' assignments in regard to the research problem of how youth are pragmatic in exhibiting English article titles written in the Kazakhstani pedagogical context. This research question was addressed through examining a range of text-pragmatic features in English article titles, which could provide information or cues related to the title writers, contextual or micro-contextual cohesion in article titles, and influence on the reader. The description of the data, analytical model, technology, and data processing is given in Chapter Four. Findings have revealed: 1. The predominance of compact article titles that consist of 6 words; 2. The dynamics of the pragmatics of the native English speakers' educational guide article titles and non-native youth, namely informative naming and problem knowledge, are common features in observed article titles; 3. A number of titles containing non-pragmatic linguistic elements which are typical for the authors; and 4. A number of titles embodying some national and cross-cultural trends of interlocution that reflect the position of a second person and first person. 5.2. Discussion of the Findings The results of the analysis are discussed in the following order: (1) Compact nature of the article titles; (2) Pragmatic features common and different among native ESP guide and non-native Kazakhstani youth article titles [11].

Analysis revealed several emerging themes. These themes and their constituent patterns are explored in depth and detail with typical examples. Identifiers also contain translations of these titles into English, which often depict translations from common stereotypes, conventions, practices, and beliefs of Kazakhstan's youth. These include National and Religious Moral and Ethical Modernization, Contemporary Science and Education, the World and Kazakhstani Policy, Youth Labor and Patriotism, Family and Traditions, and Transformation of Mental Perception and Behavior. In order to more fully understand Kazakhstani society's contemporary lexicon and some of the most pressing topics of our time among young people, let's try to play along and read through the lines of key titles. Kazakhstan as a global subject joins many modern geopolitical and economic processes, forcing today's young people to give a more pronounced answer to a number of religious, moral, scientific, educational, professional, social, patriotic, ethnic, and other questions. Such processes have provoked repeated discussions about key cultural contacts and the role of systems in strengthening social unity. Controversy often arises in relation to people's high communication needs, their preferences, frequent accents and repetitions, namely people's lexical filling in the process of transforming foreign lexical systems into their lexicon, and the potential meaning changes for individual lexical units. The topical lexical lexicon of Kazakhstan's youth is associated with interviewed students' titles. Such short headlines often reflect the content

and essence of a news message; topics are analyzed from the perspective of their belonging to the various spheres of cited core concepts. Results and analysis are based on the procedures of thematic analysis. This makes it possible to extract the main themes of this entire series using special reflecting translations into the Russian language [12].

This study's findings challenge dominant discourses present in language policy documents in Kazakhstan. It identifies that youth not only see English as a priority for their future success but simultaneously are able to challenge the country's priority of the Kazakh language, to which they belong, despite being of entirely different ethnic backgrounds. The findings show how Kazakhstan's striving to become a multilingual country leads youth to prioritize a European language alongside Kazakh at the expense of other national languages, most notably Russian. English linguistic penetration is typically hailed as an avenue to successful economic and social development; however, poor planning in response to the exact envisioning that should be conducted to stem these seemingly inevitable linguistic changes may lead to numerous disadvantages that should be acknowledged.

Youth have shown that they are not passive recipients and acceptors of such formal language policy documents because, as seen in this study's results, they have an alternative world surrounding them that can aid, reinforce, provide incentives to change, or subvert existing language policies. The aim of research spanning a range of scholarly perspectives in the field of linguistics is to contribute to creating spaces for youth to realize their power and envision effective and meaningful ways for international language contact and the threats involved to create collective agency, including a policy-making perspective that situates language policymaking as always a dynamic and locally enacted cultural negotiation that fundamentally reflects and defines a group's identity, values, and roles.

Conclusion and Future Directions

In this paper, we explored the linguistic pragmatics of English article titles in a university youth context consisting of Kazakhstan university undergraduates. The same study focus has not been undertaken before in Kazakhstan, clearly making this paper an original study and dialogue starter. Building upon existing literary knowledge, the research question for this article was proposed. Research results have suggested a multitude of very specific linguistic article title choices, used when structuring a meaningful alignment with a title's specified audience. This paper's key results lay the scope for further exploration of the pragmatic phenomenon. Future research studies could address the pragmatic phenomena by considering different university education focuses across many university specialties and locations. Furthermore, significant potential for enriched conclusions exists if both Kazakhstan's and other expatriate youth are compared. Accounts made within the paper on these results can upset potential reader prejudices when interpreting the everyday use of English article titles in the Kazakhstan youth university context.

Summary of Findings

English has become the "lingua franca of science" in the post-Soviet space due to young people's desire to access world science knowledge, so Kazakhstan uses foreign language learning as a tool contributing to the envisaged commercial and innovative development of the country. This study aimed to discover if English words in academic articles were used. This work is a modest step on Kazakhstan's journey to ensure that English language teaching is not a "cramming for exams" exercise or, worse, a commercial venture, but an effective project of manifestation that involves the development of their academic future. The paper concludes that university authorities need to better account for present socio-ideological and interlingual worldviews for Persian and for Russian. Arabic's static acceptability over time may be something interesting or exploitable in the domain of English language teaching in an academic context or other [13].

Nonetheless, students should consider translating as an act of transformation and creativity, putting into English just some ideas or sentences suitable and meeting the context. Balanced thinking skills are key in academia – plagiarism or not, the cornerstone of academic skills lies in critical thinking, translating, re-writing, and re-evaluating studies. Nowadays, commercial but original work is not absent innovation and rigour; money buys ideas and services everywhere. This research reports general findings based on a relatively small number of article titles for five linguistically, statistically significant multi-ethno-linguistic corpora. It is not perfect, but all responses demonstrate language or ideological concerns. This work presents findings in a clearly noted section of Kazakhstan, consisting of certain elites, rather than the general public.

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THE ROLE OF GRAMMAR IN EFFECTIVE ENGLISH COMMUNICATION

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Abstract

Grammar is often seen as the structure that holds a language together. Without grammar, language would lack the order and clarity needed for effective communication. In English, grammar serves as the framework for constructing meaningful sentences and conveying precise ideas. Whether in written or spoken form, grammar helps to avoid ambiguity, ensuring that speakers and writers communicate their intended message clearly. This article delves into the crucial role grammar plays in English communication, examining its importance, key components, common challenges faced by learners, and strategies for improvement.

The Importance of Grammar in English Communication

Grammar is not just a set of rigid rules but an essential tool for facilitating clear, accurate, and effective communication. Mastering grammar is key to navigating the complexities of English, enabling speakers and writers to connect with their audience, express themselves with clarity, and avoid misunderstandings. The importance of grammar in communication can be explored through several key points:

1. Clarity and Precision

One of the most fundamental roles of grammar is to provide clarity and precision in communication. By following grammatical conventions, speakers and writers ensure that their messages are easily understood. Grammar helps to organize ideas into coherent sentences, guiding the listener or reader through the thought process in a way that is structured and logical. In English, word order is essential to sentence clarity. For example, the difference between “Let’s eat, Grandma!” and “Let’s eat Grandma!” demonstrates how a simple punctuation change can lead to vastly different meanings. The former suggests an invitation to eat together, while the latter implies that the speaker intends to consume their grandmother!

Grammar rules also help to avoid ambiguity in situations where word order or punctuation could cause confusion. For example, the sentence “She saw the man with the telescope” could either mean that “she” used the telescope to see the man, or that the man had the telescope. Proper grammar allows us to structure our sentences in a way that removes this ambiguity, depending on what the speaker wants to express.

2. Professionalism and Credibility

Correct grammar is a reflection of professionalism and attention to detail. In formal settings, such as academic or business environments, the ability to use grammar properly can significantly enhance a person's credibility. Whether writing a report, giving a presentation, or composing an email, proper grammar signals that the speaker or writer is knowledgeable and competent in the language. This is particularly important in English, as it is often used as a lingua franca in professional and academic contexts.

Incorrect grammar, on the other hand, can undermine one's authority and make the speaker appear careless or less proficient in their field. For non-native speakers, mastering English grammar is an essential step toward achieving fluency and professionalism in English-speaking environments. For instance, a poorly constructed job application or résumé could potentially harm

a candidate's chances, even if their skills and experience are excellent. In such cases, correct grammar plays a pivotal role in making a positive impression.

3. Conveying Nuances and Emotions

Grammar is not merely about constructing correct sentences; it also plays a vital role in expressing subtleties of tone, mood, and emotion. English grammar provides various ways to adjust the tone of a sentence, giving the speaker the ability to convey feelings, opinions, and emotions with precision. For instance, by using the present perfect tense ("I have finished my work"), the speaker implies that the action has relevance to the present moment, whereas the past simple tense ("I finished my work") simply states the event as something that occurred in the past.

Moreover, the use of sentence structure can add nuance to how a message is received. A statement such as "I can't believe you did that!" can convey disbelief or surprise, while "I can't believe you did that..." with a trailing off suggests disappointment or anger. Such variations allow speakers to communicate their feelings and intentions more effectively, adding depth to otherwise straightforward exchanges.

4. Effective Persuasion and Argumentation

Grammar is essential for constructing persuasive arguments. In academic writing, business proposals, debates, or any form of communication that seeks to convince others, the logical and clear organization of thoughts through correct grammar is key. Without grammar, an argument may become jumbled and difficult to follow. The use of correct grammatical structures ensures that points are made clearly and are supported by appropriate evidence, making the argument more compelling and credible. For example, the use of conditional sentences, such as "If I were you, I would consider this proposal carefully," helps to express hypothetical situations, guiding the listener toward a potential course of action. By mastering the appropriate use of grammar, individuals can present their ideas more persuasively, leading to more successful outcomes in discussions and negotiations.

Key Components of English Grammar

English grammar is composed of several important elements that work together to form well-structured, meaningful sentences. To communicate effectively in English, it is essential to have a solid understanding of these components. These include tenses, sentence structure, parts of speech, and punctuation.

1. Tenses: The Backbone of Temporal Expression

Tenses are among the most fundamental aspects of English grammar, as they indicate when an action occurs. They allow speakers to express time and duration, creating a clear timeline of events. The English language has three main tenses—past, present, and future—and several variations of each. The present simple tense (e.g., "I eat breakfast every morning") expresses routine actions, while the past simple tense (e.g., "I ate breakfast this morning") refers to actions completed in the past. Future tenses (e.g., "I will eat breakfast tomorrow") allow speakers to discuss events that have yet to occur. In addition to the simple tenses, English also uses continuous, perfect, and perfect continuous tenses to convey more specific nuances of time. For instance, "I have been eating" emphasizes the ongoing nature of the action, while "I had eaten" indicates that the action was completed before another event occurred in the past.

2. Sentence Structure: The Organization of Thought

The structure of a sentence is essential in determining how ideas are communicated. In English, the typical sentence structure follows a subject-verb-object order. For example, in the sentence "John (subject) reads (verb) books (object)," the subject, verb, and object are arranged in this order to convey a clear message. English sentence structure allows for variations, such as questions and negatives, but the fundamental SVO order is essential to maintain clarity. Complex sentences, which consist of both main and subordinate clauses, allow speakers to convey more intricate ideas and relationships between thoughts. For example, "She didn't go to the party

because she was tired” combines a main clause (“She didn’t go to the party”) with a subordinate clause (“because she was tired”) to explain the reason for the action. Mastering sentence structure is vital for constructing grammatically correct and meaningful sentences.

3. Parts of Speech: The Building Blocks of Sentences

English grammar consists of several parts of speech, each playing a unique role in sentence construction. These include:

- **Nouns:** Represent people, places, things, or ideas (e.g., “dog,” “happiness”).
- **Verbs:** Represent actions or states of being (e.g., “run,” “is”).
- **Adjectives:** Describe or modify nouns (e.g., “beautiful,” “quick”).
- **Adverbs:** Describe or modify verbs, adjectives, or other adverbs (e.g., “quickly,” “very”).
- **Pronouns:** Replace nouns to avoid repetition (e.g., “he,” “they”).
- **Prepositions:** Indicate relationships between nouns or pronouns and other words in the sentence (e.g., “in,” “on,” “at”).
- **Conjunctions:** Connect words, phrases, or clauses (e.g., “and,” “but,” “because”).
- **Interjections:** Express emotions or sudden reactions (e.g., “wow,” “oh no”).

Understanding how these parts of speech function individually and together is key to constructing grammatically correct sentences that are both coherent and effective in communication.

4. Punctuation: Guiding the Reader’s Understanding

Punctuation is an essential part of English grammar that helps to clarify meaning by indicating pauses, separating ideas, and signaling the tone of a sentence. Marks such as periods, commas, question marks, and exclamation points help to structure sentences, ensuring that the reader can follow the writer’s thoughts clearly. For example, the comma can be used to separate items in a list (“I bought apples, bananas, and oranges”) or to add additional information (“My brother, who lives in Paris, is visiting this summer”). Punctuation marks are not just decorative; they are crucial for guiding the reader through the text and ensuring the message is understood as intended.

Common Grammar Challenges for Learners

Learning English grammar can be challenging, especially for non-native speakers. Some of the most common issues include:

1. Word Order: The Challenge of Syntax

English sentence structure often follows a subject-verb-object order, which may differ from other languages. In languages like Japanese, Korean, or German, sentence structure may vary significantly. This can cause confusion when learners attempt to translate directly from their native language to English.

2. Irregular Verbs: A Key Complication

Unlike many languages with regular verb conjugations, English has a large number of irregular verbs that do not follow standard patterns. For example, the past tense of “eat” is “ate,” and the past tense of “go” is “went.” These irregularities can be confusing for learners who are used to consistent verb endings.

3. Prepositions: A Source of Confusion

Prepositions in English, such as “in,” “on,” and “at,” can be particularly tricky because their usage does not always align with that of other languages. For example, in English, we say “in the car” but “on the bus,” which can be puzzling for learners.

4. Articles: A Difficult Concept

Articles such as “a,” “an,” and “the” are often a challenge for learners whose native languages do not use articles. Understanding when and how to use these articles correctly requires a deeper understanding of context and specificity.

How to Improve Grammar

Improving grammar takes time and consistent effort. Here are some strategies for enhancing your grammar skills:

1. Practice Regularly

The key to mastering grammar is regular practice. Try speaking and writing in English as much as possible. Engage in conversations, write essays, and read articles to familiarize yourself with grammar structures.

2. Learn from Mistakes

Don't be afraid to make mistakes; they are a natural part of the learning process. Review your errors and understand why they occurred so that you can avoid them in the future.

3. Use Grammar Resources

There are many online resources, textbooks, and apps available to help you learn and practice grammar. Websites like Grammarly, British Council, and Cambridge English offer exercises and explanations to help learners at all levels.

4. Immerse Yourself in English

Surround yourself with English in everyday life. Watch movies, listen to podcasts, and read books in English. The more exposure you have to the language, the more likely you are to internalize grammatical structures.

Grammar is the foundation of effective English communication. It allows us to express ourselves clearly, avoid misunderstandings, and convey ideas with precision. While learning English grammar can be challenging, mastering its rules is essential for fluency. By practicing regularly, understanding the key components of grammar, and learning from mistakes, learners can improve their grammar skills and become more confident communicators in English. The role of grammar is not only to ensure correctness but to enhance the richness and effectiveness of communication, enabling speakers and writers to convey their thoughts and emotions with clarity and impact.

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Chemical Sciences

Use of *Eichhornia crassipes* for oil spill water phytoremediation

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Abstract

The study focuses on the utilization of the *Eichhornia crassipes* in removing petroleum hydrocarbons from contaminated water sources, aiming to reduce the environmental impact of crude oil spills. *Eichhornia crassipes* offers a low-cost and sustainable alternative to conventional crude oil remediation methods. This study suggests that integrating water hyacinth into remediation practices could offer an eco-friendly solution to reduce crude oil pollution in freshwater systems, particularly in developing regions affected by frequent oil spill incidents (Anita et al., 2018; Omotayo et al., 2019).

Crude oil spillages: causes, particles, consequences

An oil spill is the release of a liquid petroleum hydrocarbon into the environment, especially marine areas, due to human activity. A form of pollution, oil spills may be caused by releases of crude oil from tankers, offshore platforms, drilling rigs or wells. Spilled substances may be refined petroleum products, such as gasoline and diesel fuel, as well as their by-products — heavier fuels used by large ships such as bunker fuel or oily refuse of any kind (NASA, 2022). Oil spills in the ocean have the potential to result in significant water contamination and damage to marine ecosystems (Ramirez Leyva et al. 2018; Li et al. 2020; Guo et al. 2022). The primary constituents of petroleum oil, namely n-alkanes, cycloalkanes, and aromatic hydrocarbons, possess mutagenic and carcinogenic potential to humans and are highly toxic to marine life and the overall ecosystem (Zhang et al. 2016; Alzahrani & Rajendran 2019). Chemically, petroleum is a **mixture of carbon, hydrogen and oxygen** (called hydrocarbons) with minor amounts of **nitrogen, oxygen, and sulfur** as impurities along with heavy metals. Petroleum is organic; it contains complex carbon, hydrogen molecular structures (CH₄) called chains that are linked together to form long-chains of more complex molecules (Louisiana Department of Energy and Natural Resources, n.d.). In the immediate aftermath of an oil disaster, the effects on fish, sea birds, and other marine animals are often very visible. Coated in oil, animals can be killed by poisoning or suffocation. Oil can also affect food sources for sealife, making it less available or of poorer quality, so even animals that survive the initial environmental hazards may still suffer in the weeks and months following the leak. In the long term, spillages can affect sedimentation rates - a crucial food source and habitat for some animals (World Economic Forum 2021).

Eichhornia crassipes for Phytoremediation

Eichhornia crassipes (Mart.), commonly known as water hyacinth, is a monocotyledonous free-floating aquatic plant belonging to the family Pontederiaceae. Originally from South America,

its ornamental appeal led to its introduction into Africa, Asia, the South Pacific, North America and Europe, where it has become invasive. The plant is characterized by its high growth, rapid and extensive spread, and strong tolerance to pH and nutrient variations as well as temperature conditions. Hence, it has been recognized by the International Union for Conservation of Nature as one of the 100 most aggressive invasive species and identified as one of the 10 severest weed plants in the world (Téllez et al., 2008; Zhang et al., 2010; Patel, 2012). Its great capacity to multiply has become a real problem in the tropics, where high temperatures and a lack of predators has led to its uncontrolled development.

E. crassipes forms floating leaf rosettes and reproduces by runners. The most striking characteristic of this species are the bloated leaf stalks, forming floats that keep the plant on the water surface. Various parts of the *E. crassipes*, such as its stems and leaves, consist of air-filled tissues, enabling it to effortlessly float on water (Rezania et al. 2015). The floating stalks can comprise up to 35 light purple floats, the long, densely growing water roots are of a blueish black. (Flowgrow, 2010)

However, *Eichhornia crassipes* is not just an invasive and harmful plant, it is also a useful plant with remarkable metal pollutant phytoaccumulation capacities. The positive properties of the plant include its ability to **absorb insecticides, phenols, phosphates, and absorb heavy metals** (cadmium, nickel, silver) (Voo51, 2016). *E. crassipes* is capable of bioconcentrating toxic metals such as Cr, Cu, Co, Ni, Zn, Pb, Cd, and As in its root system. It has been used as **phytoremediation** agent for wastewater treatments because of its ability to absorb heavy metals and grow in polluted water (Mishra and Maiti, 2017; Mustafa and Hayder, 2021).

Phytoremediation (also known plant-assisted bioremediation) is based on using plants and their associated rhizosphere to reduce the volume, mobility, or toxicity of contaminants in various environmental compartments including soil, groundwater, and other contaminated mediums (Cai B., Ma J., Yan G., Dai X., Li M., Guo S., 2016). This is considered to be a cost-effective, ideal method for the treatment of contaminated sites. Furthermore, phytoremediation is a clean technology which bears no risk of adverse environmental effects. Phytoremediation has been successfully applied to sites contaminated with sewage effluents, heavy metals, synthetic dyes, pesticides, crude oil, and polyaromatic hydrocarbons (PAHs) derived from various sources

(Al-Jawhari, 2018). Its adaptability to varying pH and temperature conditions makes it well-suited for phytoremediation applications in both domestic and industrial wastewater treatment (Adewumi and Ogbiye 2009; Monroy-Licht et al. 2022). This plant is also recognized as an important phytoremediation agent (Slak et al. 2005). It employs various mechanisms to remove contaminants from water, including **direct adsorption, accumulation in plant tissues, metabolism, and transpiration through leaves** (Mahfooz et al. 2021). In addition, exudates produced by this macrophyte **encourage microbial activity, biochemical changes occur along the root system, and mineralization at the water-root interface is improved** thanks to fungus and microbial load on the root surface (Xia and Ma 2006). *E. crassipes* stands out from other aquatic species due to its distinct properties, such as its structural carbohydrates (lignin,

crystalline cellulose, and hemicellulose polymers) (Zhang et al. 2020). The porous design, as well as functional groups (carboxyl, hydroxyl, and carbonyl), works as a catalyst for pollutant adsorption from water (Ayanda et al. 2020). The plants themselves exhibit a vigorous growth rate, large biomass, and tolerance for many metal and metalloid elements, as well as organic compounds, making them an ideal option for phytoremediation. The utility of water hyacinth in the removal of several types of hydrocarbons from different media has also been investigated. It was also demonstrated that water hyacinth was able to accumulate hydrocarbons from contaminated sediments (Ndimele P., Ndimele C., 2013). Past studies have highlighted its capability to absorb contaminants such as heavy metals, nitrates, and certain organic compounds (Gajalakshmi & Abbasi, 2004). Additionally, the plant's extensive root system and ability to produce biomass quickly allow it to absorb significant quantities of pollutants from contaminated waters.

Furthermore, *E. crassipes* has also shown effectiveness at removing contaminants through the use of dried roots as biosorption material in addition to its living biomass. The surface functional groups on the dried roots, which include alcohol, ketones, aldehydes, amides, and others, allow for the binding of pollutants in aqueous solutions (Zheng et al. 2009). Overall, *E. crassipes* exhibits the ability to accumulate heavy metals and reduce inorganic and organic pollutants through various mechanisms (Paz-Alberto and Sigua 2013).

In the case of HMs, these mechanisms have a significant part in maintaining overall metal homeostasis

and mitigating the risks associated with high metal concentrations, rendering plants' tolerance to heavy metal stress. These strategies involve exclusion of certain metals from intracellular environments, sequestration of toxic ions into compartments, and detoxification processes (Yan et al. 2020). This process involves multiple stages. Initially, the roots absorb the metals, which are then transported from the root system. Certain HMs can move through the xylem and reach the shoots, as depicted in Fig. 2. Different plant organs, such as the roots, stems, leaves, seeds, and fruits, can detoxify and sequester metals at the cellular level (Zulqar and Ashraf 2022). Strategies used by *E. crassipes* to eliminate/accumulate heavy metals (HMs) at the cellular level. Glutathione peroxidase (GPx), catalase (CAT), superoxide dismutase (SOD), glutathione

S-transferase (GTS), glutathione (GSH), phytochelatin (PC)

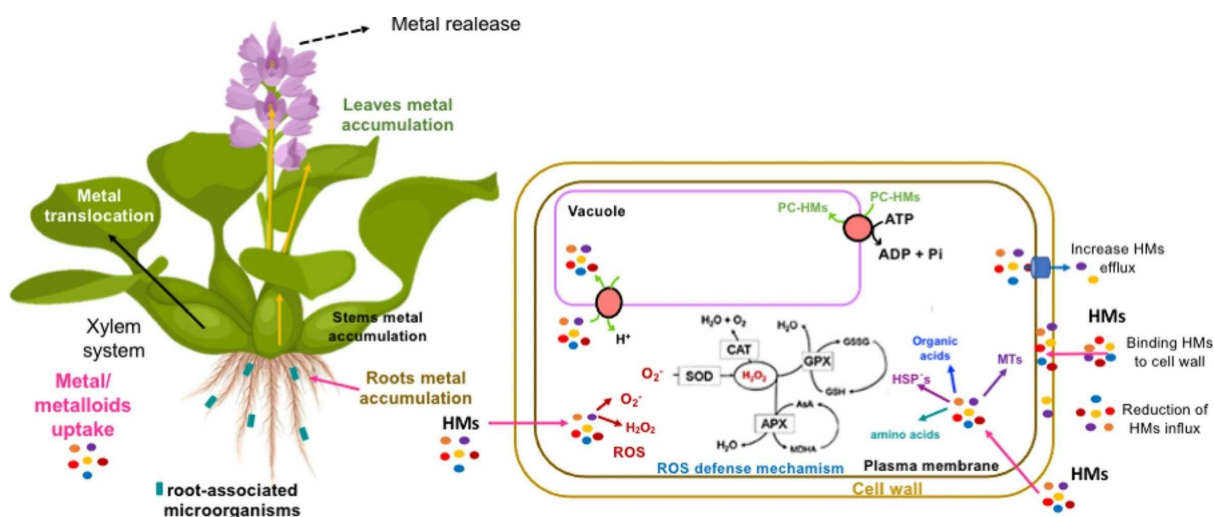
Eichhornia plants employ seven primary mechanisms to cope with metal intoxication. The first is apoplastic binding, where metal ions in the root cells are managed through interactions in the apoplast region. These ions tend to accumulate at the interfaces of the plasma membrane and cell wall, electively limiting their mobility within the plant (DalCorso et al., 2013). The second mechanism involves the plant's cation exchange capacity (CEC), controlled by exchange groups on the cell wall. These groups regulate the availability of metals for absorption by providing cation-binding sites in the root cell wall. Histidyl groups, polysaccharides, and pectic regions are integral to this process, immobilizing and facilitating metal uptake (Guigues et al., 2014; Hooper et al., 2010).

Another key mechanism is vacuolar compartmentalization. Metal ions that enter the plant cells are either stored in vacuoles or expelled via efflux mechanisms, isolating them from the cytosol and other cellular components to prevent toxicity (Sharma et al., 2016). Additionally, the plants produce heat shock proteins (HSPs), which refold misfolded proteins and minimize their accumulation caused by metal activity within the cells (Amm et al., 2014).

Eichhornia plants also activate their antioxidant defense system to mitigate the effects of reactive oxygen species (ROS), which are generated under metal stress. Enzymatic antioxidants such as superoxide dismutase, catalase, glutathione peroxidase, and ascorbate peroxidase convert ROS into less harmful compounds. Non-enzymatic antioxidants like glutathione, proline, and ascorbic acid further contribute to reducing oxidative damage (Vu and Gowripalan, 2018).

Another elective strategy is the production of phytochelatin (PCs), peptides that bind with metal ions. These peptides, with the structure $(\gamma\text{-Glu-Cys})_n\text{-Gly}$, typically consist of 2 to 4 repeating units but can range up to 11. They are synthesized in response to specific heavy metals such as cadmium, copper, zinc, silver, gold, mercury, and lead, with their production facilitated by the enzyme PHYTOCHELATIN SYNTHASE (Aborode et al., 2016; Cobbett, 2000; Clemens, 2001). Finally, the plants produce metallothioneins (MTs), which are cysteine-rich peptides containing mercaptide groups. These groups electively bind metal ions, playing a crucial role in detoxification (Manara, 2012). Through these mechanisms, *Eichhornia* plants manage and mitigate the harmful effects of metal intoxication.

Understanding the genetic mechanisms that regulate physiological activities in plants is crucial for improving their tolerance to and capacity for accumulating heavy metals (HM). This involves exploring genetic regulation, the presence of cellular regulatory elements, epigenetic factors, and molecular signaling pathways. Such investigations enhance our comprehension of how plants respond to and manage these contaminants (Ghuge et al., 2023). Collectively, these mechanisms are vital in shaping the interactions between plants and heavy metals, enabling the accumulation of these substances in various plant tissues.



Eichhornia crassipes' general biological characteristics

WH is made of structural carbohydrates such as lignin, crystalline cellulose, and hemicellulose polymer (Zhang et al., 2020). As a result, the surface of WH contains critical functional groups, especially carboxyl, hydroxyl, and carbonyl, which act as a **catalyst for the adsorption of water contaminants** onto plant-based adsorbents (Brown et al., 2020). The roots of WH contain functional groups —PO₄, C=O, and C—H (Milke et al., 2020). The composition of WH 1bres includes a significant amount of cellulose in the form of hemicellulose (33%), cellulose (25%), as well as lignin (10%) (Salahuddin et al., 2021). These WH features urge scientists to study the invasive species' applicability for water restoration. Several research-based experiments have also been done using cellulose from WH to eliminate water contaminants (Emam et al., 2020; Salahuddin et al., 2021). This is mainly because this aquatic plant's cellulose backbone contains multiple hydroxyl groups (Singh and Chandra, 2019). These **hydroxyl groups are the primary determinants of adsorption**, chemically tuned to facilitate generation. Hydroxyl groups (-OH) are highly polar, meaning they can form hydrogen bonds with other polar substances, including water and certain components in oils (Sharma et al., 2018). In plant cell walls, hydroxyl groups are part of cellulose and other polysaccharides, which can interact with oils and fats, particularly if the oils contain polar groups themselves (Santos et al., 2020). The plant's root system is rich in lignin and cellulose, both of which contain hydroxyl groups that can trap oil droplets through physical entrapment rather than chemical bonding, due to crude oil's nonpolar nature (Okoh et al., 2017). Furthermore, *Eichhornia crassipes* produces specific enzymes, such as peroxidases, that can partially degrade hydrocarbons, making it particularly useful in breaking down complex oil molecules into less harmful compounds (Alade & Kuebutornye, 2019).

WH is well-prominent for its porous structure, and scientists have explored carbonising the material to develop mesoporous carbon, producing higher active species (Zhang et al., 2020). WH-based adsorbents have a lesser surface area than synthetic-based adsorbents for adsorption uses. According to studies, the surface areas of WH's roots are between 4.5 and 5.8 m² g⁻¹, while the surface areas of its petioles are between 2.5 and 3.3 m² g⁻¹ (Madikizela, 2021). Surprisingly, most WH-based adsorbents are generated from **roots**. Specific functional groups in plant biomass primarily determine their adsorption capacity. The surface area of WH-derived biochar was 50.5 m² g⁻¹ in one experiment (Xu et al., 2020). In certain circumstances, the chemical treatment of

WH is used to enhance the surface area and thus the adsorption process. This is a critical need, and adsorption was directly proportional to the specific surface area (Gwenzi et al., 2017).

To advance a conservative arrangement, the development of eco-friendly and cost-elective adsorbents has gained high importance as the expenses are much lower in comparison to the other advanced methods, including ion exchange, membrane ltration, ozonation, photochemical oxidation, sonolysis, and so forth (Awe et al., 2020; Talaiekhozani et al., 2021; Tkaczyk et al., 2020). Throughout the

1990's, it was discovered that WH was extremely functional, removing COD from wastewater treatment plant discharge that had been stated to contain till 1000 mg L⁻¹

(Madikizela, 2021). Diverse outcomes described in the literature could result from exposure time variations. Roots were found as the primary polluted absorbers in all cases (Yan et al., 2019, 2019). According to a recent analysis, pollutant uptake (in this case, pharmaceuticals) mainly occurs via roots, then transfers into aerial tissues such as stems and leaves (Madikizela et al., 2018).

E. crassipes thrive in nutrient-rich waters, displaying adaptability to varying nutrient concentrations. However, their growth is impeded in seawater due to salinity, which explains their absence in coastal areas (Jafari 2010). The optimal salinity range for their growth is less than 5 mg/L. These plants exhibit tolerance to both highly acidic and highly alkaline conditions, although neutral water bodies promote more robust growth (Ajithram et al. 2021). They can withstand pH values ranging from 4 to 10 (Center et al. 2002). Temperature-wise, water hyacinths can flourish within a range of 10–40 °C, with an optimum temperature of 25–30 °C. However, they are considered sensitive to cold temperatures (Wilson et al. 2006). Remarkably, *E. crassipes* may persist for months in damp sediments and they can withstand dry circumstances (Center et al. 2002). In water bodies characterized by high nutrient levels stemming from agricultural runoff, deforestation, and inadequate wastewater treatment, the presence of this plant is commonly observed (Verma et al. 2003).

At present, carbon-based materials produced by WH have been discovered to eliminate a large volume of organic contaminants in water sources. These organic substances comprise phenol (Talaiekhosani et al., 2021), sulfachloropyridazine (Wang et al., 2021) with additional sulfonamides (Liu et al., 2018), Ruoroquinolones (Cuerda-Correa et al., 2020) and tetracycline (Tomczyk et al., 2020). In such a case, lignocellulosic fibres isolated from WH were employed to absorb volatile n-alkane hydrocarbons (Mahfooz et al., 2021). Conversely, findings revealed that the mineral acid and organic solvent modified WH root biomass had a better capacity for the sorption of volatile n-alkane hydrocarbons (Mahfooz et al., 2021). Based on the enthalpy of adsorption, the same study group concluded that the adsorption bond of volatile polar solvents on WH root biomass is greater than the adsorption bond with preponderance lignocellulosic adsorbents were formerly examined (Santoso et al., 2020)

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Medical Sciences

Как меняется здоровье людей в эпоху цифровизации и работы из дома

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Аннотация

С развитием цифровых технологий и переходом на удаленную работу возникают новые факторы, влияющие на здоровье людей. Данная статья исследует влияние цифровизации на физическое и психическое здоровье, анализируя как положительные, так и отрицательные аспекты. Рассматриваются вопросы, связанные с воздействием длительного использования компьютеров, снижением уровня физической активности, влиянием экрана на зрение, а также ростом стресса и психоэмоционального напряжения. Приведены стратегии и рекомендации для поддержания здоровья в условиях цифровизации и удаленной работы.

1. Введение

В условиях цифровизации и массового перехода на удаленную работу изменились условия труда и образ жизни людей. С одной стороны, технологии обеспечивают удобство и гибкость, но с другой – длительная работа за компьютером и снижение физической активности могут негативно сказываться на здоровье. В данной статье исследуется влияние этих факторов на здоровье и рассматриваются меры для смягчения их негативного воздействия.

2. Физическое здоровье

Физические аспекты удаленной работы включают снижение уровня активности, увеличение времени сидячего положения и воздействие на зрение. Для количественного анализа воздействия на здоровье рассмотрим следующие зависимости.

2.1 Формулы для оценки уровня активности

Уровень физической активности можно описать следующей формулой:

$$PA = \frac{\sum_{i=1}^n T_i \cdot E_i}{T_{total}},$$

где PA — средний уровень активности, T_i — время, затраченное на конкретный вид активности i , E_i — интенсивность нагрузки для этого вида активности, T_{total} — общее количество часов работы.

2.2 Синдром компьютерного зрения

Воздействие экрана на зрение можно оценить на основе времени, проведенного за компьютером:

$$Risk = k \cdot H,$$

где Risk — вероятность развития синдрома компьютерного зрения, k — коэффициент, зависящий от интенсивности использования экрана, H — общее количество часов за компьютером в день.

3. Психическое здоровье

Цифровизация и удаленная работа могут способствовать росту стресса и психоэмоционального напряжения. Рассмотрим психофизиологический показатель стресса:

$$StressIndex = \frac{\sum_{j=1}^m S_j \cdot W_j}{W_{total}},$$

где StressIndex — индекс стресса, S_j — уровень стресса для каждого аспекта j (например, доступность 24/7, многозадачность), W_j — весовой коэффициент для каждого аспекта, W_{total} — сумма весов.

4. Анализ данных и графики

Для анализа влияния удаленной работы на здоровье были собраны данные о физическом и психическом состоянии пользователей. В таблице представлены ключевые параметры.

Параметр	Значение	Единицы	Описание
Уровень активности	45	%	Средняя физическая активность
Часы за компьютером	8	ч	Ежедневное время работы за ПК
Индекс стресса	2.3	баллы	Оценка уровня стресса
Зрение	0.8	баллы	Вероятность синдрома

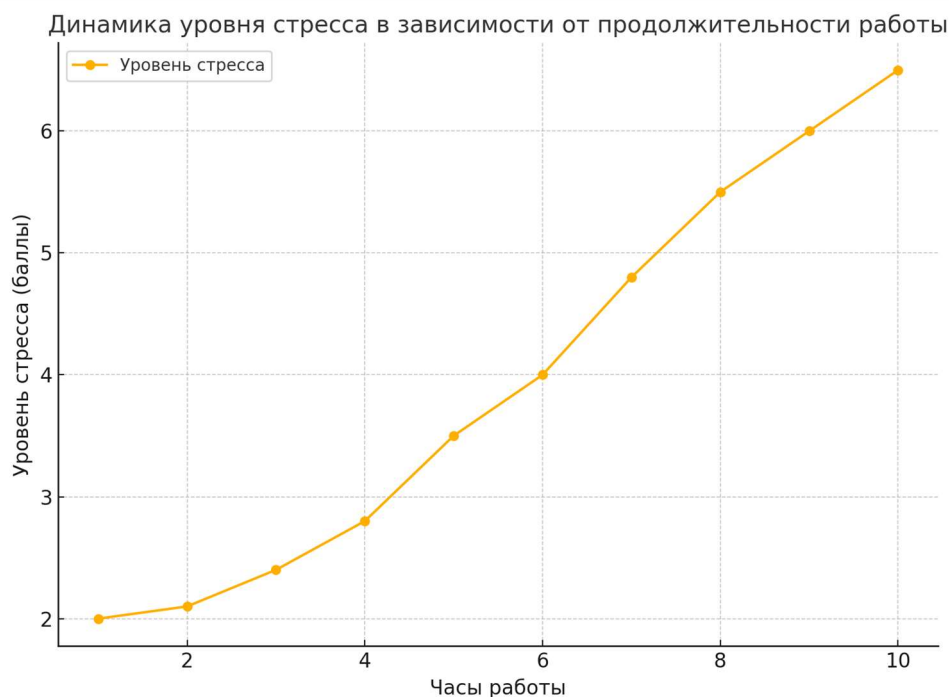


Рисунок 1. Динамика уровня стресса в зависимости от продолжительности работы

5. Рекомендации по поддержанию здоровья

Для поддержания здоровья в условиях цифровизации и удаленной работы рекомендуется:

1. Регулярные физические упражнения и перерывы.
2. Организация рабочего пространства с соблюдением эргономики.
3. Установка чётких рабочих часов и периодов отдыха.

4. Использование техник релаксации.

6. Заключение

Удалённая работа и цифровизация представляют собой как возможности, так и вызовы для здоровья людей. Поддержание физического и психического здоровья сотрудников требует комплексного подхода, включающего оптимизацию рабочего места, регулирование рабочего времени и поддержку психологического состояния. Важно, чтобы компании и сотрудники совместно работали над созданием условий, которые способствуют здоровью и благополучию, а также использовали возможности цифровых технологий для поддержания баланса между работой и личной жизнью.

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REGIONAL FEATURES OF EPIDEMIOLOGICAL INDICATORS AND RESULTS OF ONCOLOGICAL SCREENING IN KAZAKHSTAN

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Annotation: In this scientific and analytical work, the indicators of incidence and mortality from cervical cancer, breast cancer and colorectal cancer in the regions of our country are considered. The screening methods currently used and the results of this preventive survey of the population are described in detail. Detailed step-by-step algorithms are presented, and the principles of organization and diagnostic capabilities of the screening program for the active detection of these nosological forms of malignant neoplasms in clinically asymptomatic individuals are reflected.

Key words: cervical cancer, breast cancer, colorectal cancer, epidemiology, incidence, mortality, screening, Pap test, smear for oncocytology, mammography, hemocult test, fecal occult blood test - FOBT, total colonoscopy.

Today, one of the most important postulates of the oncology service continues to be the early diagnosis of malignant tumors. The purpose of screening is to identify asymptomatic (preclinical) cancer or precancerous conditions in an otherwise healthy target population. In this case, screening plays a leading role in secondary cancer prevention. The key concept of cancer screening is to identify pathology at a stage of development when the effectiveness of treatment is maximum and the prognosis is most favorable. When precancerous diseases are detected during screening, secondary prevention methods allow to prevent the transition of the initial pathological state to cancer. In this case, the main conditions for screening are the presence of trained personnel and a standard approach to identifying the trait being studied and evaluating the results. The methods used must be sufficiently simple, reliable and reproducible, as well as have sufficient sensitivity and high specificity [1-3].

Screening plays an important role in improving early diagnosis and treatment outcomes. According to the Guide to Cancer Early Diagnosis by Ilbawi A. et al. [4], screening aims to detect unrecognized cancer or its prior lesions in a typically healthy, asymptomatic population through tests or other procedures that can be applied quickly and are widely available to the target population. In screening, the target population is assessed for unrecognized cancer or precancer, and most people tested will not be diagnosed with the disease. Screening should be seen as a process and not as the performance of a specific test, examination, or procedure. The screening process includes a system of informing and inviting the target population to participate; administering the screening test; following-up with test results and referral for further testing among those with abnormal test results; ensuring timely pathologic diagnosis, staging and access to effective treatment with routine evaluation to improve the process. A screening program encompasses the process from invitation to treatment and requires planning, coordination and monitoring and evaluation.

To date, the republican oncological screening program includes three nosological forms of malignant neoplasms - cervical cancer (CC), breast cancer (BC), colorectal cancer (CRC). Let's consider the current epidemiological indicators, methodology and results of cancer screening in our country.

CC in the structure of all malignant tumors of both sexes of the population in 2022 took 6th place with a share of 5.51% (2021 - 4th place, 5.54%), in women - stable 2nd place - 9.7% (9.7%) [5].

The incidence rate per 100 thousand population increased from 9.4 to 9.92. In 10 regions of the republic, the incidence rate is higher than the national average: Pavlodar - 17.2 per 100 thousand people. (2021 - 16.7) - the highest level, East Kazakhstan - 14.3 (10.8), North Kazakhstan - 14.3 (10.2), Atyrau - 13.2 (13.8), Zhetysay - 11.7, Karaganda - 11.7 (12.0), Abay - 11.1, Akmola - 11.1 (11.9), Mangistau - 11.1 (9.7), Kostanay - 10.8 (10.6) regions.

Low incidence rates in Zhambyl region - 5.8 per 100 thousand population (5.7), Turkestan region - 6.1 (5.2), Aktobe region - 8.3 (11.6), Kyzylorda region - 8.5 (8.2) areas.

CC in the structure of causes of death from malignant tumors of the population of both sexes in 2022 rose from 9th to 8th position, with a share of 4.6% (2021 - 4.3%), mortality from CC is stable at 3.1 per 100 thousand population (3.1).

The mortality rate from CC in 10 regions is higher than the national average: Akmola - 4.2 per 100 thousand population (2021 - 3.1) - maximum level, West Kazakhstan - 4.1 (4.8), Pavlodar - 3.8 (5.6), Almaty - 3.7 (2.5), Zhetysay - 3.7, Atyrau - 3.4 (4.0), East Kazakhstan - 3.3 (3.8), Karaganda - 3.2 (4.7), Kostanay - 3.2 (2.4) regions and Almaty city - 3.4 (2.9).

Below the national average, mortality was recorded in Abay region, cities Astana, Shymkent - 2.9 per 100 thousand population, Mangistau - 2.8 (3.0), Turkestan - 2.3 (2.2), Aktobe - 2.2 (3.0), North - Kazakhstan - 2.0 (2.6), Kyzylorda regions - 1.7 (3.5) - the best result [5].

In 12 regions, a 100% level of morphological verification of the diagnosis was ensured, the lowest or worst indicator for the third year was in the Kyzylorda region - 94.3%, below the national average indicators in Akmola - 98.8%, Atyrau - 98.9%, Kostanay - 98, 9%, Mangistau - 97.6%, Pavlodar - 96.6%, regions and Almaty city - 98.5%;

In a number of regions, the frequency of diagnosis of stage I-II CC was below the national average (88.1%) - in Akmola - 76.2% (2021 - 73.6%) - the worst result in the country, in Karaganda - 77, 2%, Zhetysay - 82.9%, Abay - 83.8%, Kostanay - 84.3%, Aktobe - 85.5%, West Kazakhstan - 85.7%, Pavlodar - 81.3%, while that in the Atyrau region - 100.0% result.

The proportion of stage IV CC is higher than the national average (2.7%) in the following regions: the worst result is in Zhetysay (6.1%), above the national average in Karaganda - 5.1% (2021 - 5.6%), Akmola - 4.8% (2.3%), Kostanay - 4.5% (4.4%), North Kazakhstan - 3.9% (7.4%), Almaty - 3.7 % (5.1%), Zhambyl - 2.9% (0.0) regions, cities Almaty - 3.6% (1.8%) and Shymkent -

3.8% (5.9%). The lowest neglect is in the East Kazakhstan region - 1.0% (0.7%).

Late diagnosis rates (III-IV stages) for CC are above the national average - 11.9% (15.4% in 2021) were noted in Akmola - 23.8% (2021 - 26.4%) - worst result, Karaganda - 22.8% (35.2%), Pavlodar - 18.8% (20.8%), Zhetysu - 17.1% (24.2%), Abay - 16.2% (12.8%), Kostanay - 14.6% (15.6%), Aktope - 14.5% (9.6%), West Kazakhstan - 14.3% (32.4%) regions. The lowest neglect is in the Mangistau region - 6.0% (20.8%).

Across the country, the five-year survival rate of patients with CC registered in 2018 was 59.9% in 2022, with a decrease from the level of 2021 (67.5% for those registered in 2017), and with a significant range in by region, from the maximum – 72.9% (2021 – 70.7%) in the North Kazakhstan region, to the minimum – 34.9% (64.4%) in the Atyrau region [5].

CC screening is a periodic, comprehensive examination of women of a certain age group as part of a special medical program to prevent and reduce incidence and mortality from CC.

Type of screening - population. The purpose of screening is to identify pre-invasive diseases of the cervix with subsequent recovery. The screening method is a cytological examination of a smear for oncocytology from the cervix (traditional and liquid cytology). Coloring according to the "Papanicolaou test" (Pap test). Interval - 1 time in 4 years. Target group: women aged 30-70 years who are not registered in the dispensary for CC. The expected results are a decrease in incidence and mortality from CC.

Screening steps:

1) Preparatory - formation of target groups, information support and invitation to screening. The preparatory stage is carried out by the nurses of the primary health care organization responsible for preventive measures and includes: annual compilation of a list of women subject to screening in the coming year by November 15 of the current year, followed by monthly correction; informing target groups of the female population about the need for screening; screening invitation; ensure timely screening.

2) Screening - filling out a statistical card of a preventive medical examination (screening) of an outpatient (form 025-08/y), a register of patients subject to cytological screening and taking material for cytological examination from the cervix. The screening examination of the target groups of the female population is carried out by a specially trained midwife of the primary health care organization.

3) The final one is obtaining the results of cytology, informing the woman and developing further management tactics, fill out accounting and reporting statistical documentation. Responsible for the final stage of screening is the obstetrician-gynecologist of primary health care [6].

Cytological screening of CC is a complex of organizational and medical measures aimed at early detection of precancerous and neoplastic diseases of this localization and at reducing the mortality of this cohort of patients. For traditional cytology, a smear containing 8-12 thousand cells of stratified squamous epithelium (including cells of metaplastic epithelium) is considered adequate; for liquid cytology - 5 thousand cells. For both methods, the number of cells of endocervical epithelium and/or metaplastic epithelium (from the transformation zone) must be at least 10 (single or in clusters). If more than 75% of the cells of the stratified squamous epithelium are covered with erythrocytes, leukocytes, etc., then the quality of the smear is considered unsatisfactory.

Interpretation of the results of a cytological study is carried out according to the Bethesda-terminology cytological system:

Intraepithelial changes and malignant processes are absent (NILM). This group includes cytological conclusions about the normal state of the epithelium, as well as the presence of various non-neoplastic diseases. Normally, squamous epithelial cells, groups of cells of columnar epithelium and metaplastic epithelium, a small number of leukocytes, and rod/mixed microflora

are found in preparations. In the presence of non-neoplastic processes, their nature and, if possible, the cause are specified: atrophic changes, reactive changes associated with inflammation, including typical regeneration. In addition, the presence of microorganisms is indicated: *Trichomonas vaginalis*, fungi, morphologically corresponding to *Candida* spp., bacterial vaginosis, cellular changes corresponding to the defeat of Herpes simplex virus, squamous epithelial cells with atypia of unknown significance (ASC-US), squamous epithelial cells with atypia of unclear significance, not excluding the presence of a high degree of intraepithelial changes (ASC-H). Low-grade squamous intraepithelial changes (LSIL) include lesions associated with HPV and CIN I, high-grade squamous intraepithelial changes (HSIL) include CIN II, CIN III, carcinoma in situ and cases suspected of invasion, squamous cell carcinoma, cervical (glandular) epithelium with atypia of unknown significance, cells of the cervical (glandular) epithelium, possibly neoplasia, endocervical adenocarcinoma in situ, endocervical adenocarcinoma, endometrial adenocarcinoma, secondary adenocarcinoma, unclassified carcinoma, other malignant tumors.

There are certain features when taking material for oncocytology: firstly, the examined woman should be informed about the exclusion of sexual intercourse, vaginal manipulations, including douching, baths, tampons, etc. 2 days prior to sampling. Taking material for cytological examination is carried out by the midwife of the examination room of the department of medical examinations of the primary health care organization: the traditional method (2 glasses - with obligatory fixation in 96% alcohol, it is preferable to use glass slides with a polished edge, which are easily marked) or the liquid cytology method (one container with stabilizing liquid); the code or surname of the patient, identical to the code and surname in the form for sending material for cytological examination, should be clearly marked on the glasses or container [6].

At the same time, when using the traditional method, the biomaterial is delivered to the cytological laboratory as soon as possible after its collection in specialized containers for glass slides with 96% alcohol. If there are visible visual changes in the cervix, then the material is taken from the woman and, without waiting for the results, she is referred for an examination by an obstetrician-gynecologist.

A cytological study is carried out in centralized cytological laboratories at oncological institutions, where an archive of cytological preparations of patients involved in the screening examination is formed, regardless of the result, for a period of at least 10 years with the formation of a computer database.

What material and technical equipment is required to take material for a Pap test? It is as follows: soap and water for washing hands, a light source for cervical examination, a gynecological chair, a disinfected speculum and gloves, an Eyre spatula, a glass slide and a marking pen, a container with a stabilizing solution for liquid cytology, a fixative solution (96% alcohol), a container with warm water for lubricating and warming the vaginal mirrors, a 0.5% chlorine solution for disinfecting gloves and instruments, or another approved for this purpose. And, of course, the registration form itself.

For carrying out liquid cytology, you additionally need: a disposable cervix brush, a container with a stabilizing solution for liquid cytology, and a fixing solution.

At the same time, a smear for oncocytology cannot be taken: during menstruation, earlier than 48 hours after sexual contact or after using lubricants, vinegar or Lugol solution, tampons or spermicides, after vaginal examination or douching, and also during the treatment of genital infection.

Now, regarding the results of CC screening. In 2022, 771,282 women of the target group aged 30 to 70 years were examined during cytological screening (in 2021 - 757,454).

During cytological screening in 2022, 392 cases of cervical cancer were identified (319 in 2021). The detection rate increased from 0.42 to 0.51 per 1000 women examined

High detection of CC during screening is ensured in Aktobe, Almaty, Atyrau, East

Kazakhstan, Kyzylorda, Pavlodar, North Kazakhstan, Turkestan regions and Shymkent city. The detection rate in these regions ranges from 0.55 to 1.59 per 1000 women examined. The best indicator is in Atyrau region - 1.59. Compared to 2021, there is an increase in detection in 10 regions, with the exception of Akmola, Aktobe, Zhambyl, Kostanay, Mangistau, North Kazakhstan regions and Shymkent city. The worst result in Astana is 0.15 per 1000 women examined [5].

Cytologically, cervical precancer was detected in 1.16% of those examined (2021 – 0.99%). The detection rate of precancer below 0.6% (the planned indicator for 2022, according to the Comprehensive Plan) was noted in Aktobe, Karaganda and Kostanay regions.

A high proportion of stage I CC (70% or more) was detected in 6 regions of the country (in 8 in 2021): Kostanay, Mangistau (94.7% - best result), North Kazakhstan, Turkestan regions, cities Almaty and Astana. Low levels of early detection of CC (below 50%) were not observed in any region.

Localized processes (stages I-II) were identified in 99.2% of all cases of detected cancer (96.5%). In the Akmola and Karaganda regions, cases of CC were identified not only in localized, but also in widespread stages of the process. A total of 3 cases of CC in stage III and no cases in stage IV were identified (11 and 0, respectively) [5].

BC ranks first in the structure of the frequency of malignant tumors of both sexes in the population with a share of 14.7% (2021 - 15.4%). This situation has been stable since 2004; in addition, BC ranks first and remains consistently in this position in the structure of female oncopathology. The incidence of BC in 2022 in the country as a whole increased to 26.5 per 100 thousand (2021 – 26.3). In the structure of cases, BC occupies the 1st ranking place in the vast majority of regions and cities of the country, except for three: Akmola, Kyzylorda and North Kazakhstan regions, where lung cancer takes the 1st ranking place [4].

Above the national average - 26.5 per 100 thousand of us. – incidence of BC in 10 regions of the country: Abay – 33.3, Akmola – 32.7 (2021 – 29.8), East Kazakhstan – 44.7 (39.9) – the highest level, West Kazakhstan – 31.2 (28.4), Karaganda – 40.2 (40.1), Kostanay – 37.5 (35.8), Pavlodar – 43.2 (47.4), North Kazakhstan – 34.7 (38.2) regions and Almaty city – 35.4 (34.5), Astana city – 31.5 (28.4). Below average indicators per 100 thousand of us. in Aktobe - 21.6 (24.3), Almaty - 21.9 (17.7), Atyrau - 22.8 (15.7), Zhambyl - 14.2 (15.1), Zhetysu - 22.8, Kyzylorda - 14.6 (14.4), Mangistau - 14.7 (17.3), Turkestan - 11.3 (11.7) regions and Shymkent city - 14.9 (21.9) [5].

BC ranks third in the structure of causes of death from malignant tumors in the population of both sexes for the thirteenth year in a row, amounting to 8.1% in 2022 (2021 – 8.7%). In the republic as a whole, mortality from BC decreased by 13.0%, from 6.2 to 5.4 per 100 thousand people.

The regions where mortality from BC is higher than the national average include: Abay - 10.1 per 100 thousand people (maximum level), East Kazakhstan - 8.0 (2021 - 8.5), Pavlodar - 7.1 (10.0), North Kazakhstan - 7.0 (11.4), Kostanay - 6.9 (7.5), Akmola - 6.5 (8.2), West Kazakhstan - 5.7 (6.9), Zhambyl - 5.5 (4.8) and Astana city – 6.3 (6.6), Almaty city – 6.6 (9.5). The indicators are significantly lower in Aktobe - 4.5 (3.5), Almaty - 4.5 (5.8), Zhetysu - 4.0, Atyrau - 3.7 (3.0), Kyzylorda - 4.4 (4.1), Turkestan - 3.6 (3.6), Mangystau regions - 2.7 (3.6) - the lowest level [5].

Mass screening to identify BC patients should mainly involve healthy women without any signs of the disease or symptoms. Screening not only helps to detect hidden forms of cancer that can be treated, but also has psychological value for women. As a result of screening, women are convinced that they do not have BC, and this is the most important potential success of such programs. While the ultimate goal of screening is to reduce BC mortality, its immediate goal is to detect cancer before clinical manifestation. However, BC is a heterogeneous disease, which can significantly affect the effectiveness of screening. Screening models for BC are usually based on the fact that the majority of detected tumors are invasive cancers in the early stage of progression. In addition, it must be taken into account that the detection of cancer (or its precursors) before

clinical manifestation increases the risk of false positive diagnosis [7,8].

Mammography has a sensitivity of 95% and a specificity of 97%. These indicators decrease when examining women with denser mammary glands (young age, use of hormone therapy), with low quality mammography, and also with insufficient qualifications of the radiologist. Detection of high-grade invasive cancer by screening, when the tumor is not yet detected by clinical examination (palpation), means the possibility of reducing mortality from BC [9].

Preventive screening for early detection of BC in the Republic of Kazakhstan includes [10]:

1) mammography of both mammary glands in two projections - direct and oblique in the mammography room of the city, district polyclinic (mobile medical complex). All digital mammograms in the presence of a system for archiving and transferring medical images are copied to CDs and other electronic media and transferred to the server of the mammography room of the Cancer Center using specialized licensed software integrated between medical organizations; in case of impossibility of digital transmission - they are printed on X-ray film at a scale of 1:1 - 100% (1 patient - 1 set - 2 or 4 mammograms) with subsequent transfer to the mammography room of the Cancer Center;

2) interpretation of mammograms according to the BI-RADS classification (M0t, M0d, M1, M2, M3, M4, M5) by two or more independent radiologists of the same medical organization - double reading or different medical organizations: a radiologist of the mammography room city, district polyclinic (mobile medical complex) - the first reading, and the radiologist of the mammography room of the Cancer Center - the second reading;

3) in-depth diagnostics - targeted mammography, ultrasound examination (hereinafter - ultrasound) of the mammary glands, trepanobiopsy, including under ultrasound or stereotaxic control for histological examination, which is carried out in case of detection of pathological changes on mammograms (M0d) in the mammography room of the Cancer Center.

√ An average medical worker or a responsible person of the organization of outpatient care sends the patient for mammography to the district, city polyclinic.

√ The X-ray laboratory assistant of the mammography room of the city, district polyclinic (mobile medical complex) performs mammography, fills out a referral for double reading of mammograms and transmits the referral through information interaction.

Radiologist of the mammography office of the city, district polyclinic (mobile medical complex): fulfills the requirements for the safety and quality of mammographic examinations; evaluates the quality of the images provided and the correctness of the installation; performs repeated mammography in the M0t category (technical errors of mammography); determines the radiological density of the mammary glands on the ACR scale (A, B, C, D) indicating this parameter in the study protocol; conducts the first reading of mammograms with interpretation of the BI-RADS classification results. In the M0d category (undetermined or suspicious radiological changes requiring additional examination), the study protocol indicates the predominant pathology: education, asymmetry, violation of architectonics, microcalcifications; sends mammograms, electronic copies of mammograms through the archiving system and transfer of medical images to the workplace of the mammography office of the Cancer Center together with directions for double reading of mammograms; directs low-dose computed tomographic images through the system of archiving and transferring medical images to the workplace of the computer tomography office of the Cancer Center together with copies of images recorded on CD-ROMs or other electronic media and directions for double reading.

◆ The radiologist of the mammography room of the Cancer Center: evaluates the quality of the provided images and the correctness of the styling. Viewing digital x-ray images transferred to the server or on digital media (CD, DVD) is carried out on a monitor for interpreting digital x-ray images with a resolution of at least 5 megapixels, which has a certified grayscale transmission in accordance with the DICOM standard; conducts a double (second) reading of mammograms with

the interpretation of the results according to the BI-RADS classification, using, if necessary, archival images. Organizes the third reading according to indications. With double reading, an independent interpretation of the images is carried out (blinding method - the second radiologist does not know the results of the first reading); in the M0m category (technical errors in mammography), recommends repeat mammography; in the M0d category (uncertain or suspicious radiographic changes requiring additional examination), the study protocol indicates the predominant pathology: education; asymmetry, violation of architectonics, microcalcifications; recommends that the outpatient care organization, according to indications, invite the patient for in-depth diagnostics (targeted mammography, ultrasound of the mammary glands, trephine biopsy, including under ultrasound or stereotaxic control, followed by histological examination of the material); collects and archives all mammograms (films and electronic media) made as part of the examination. The shelf life of mammograms is at least 3 years after leaving the age subject to a screening study; the results of the double (second) reading are transferred to the outpatient care organizations through information exchange.

◆ Indications for in-depth diagnostics are the conclusions of double reading mammograms M0d (uncertain or suspicious X-ray changes requiring additional examination).

◆ In-depth diagnostics is carried out in two stages. At the first stage, ultrasound is performed, according to indications, targeted mammography, possibly with an increase (with asymmetry, violation of architectonics and the presence of microcalcifications). When visualizing a suspicious pathology (M4 and M5), the second stage is performed - trepanbiopsy, including under ultrasound control and stereotaxic control for histological examination.

◆ Histological examination is carried out in the laboratory of pathomorphology or pathological bureau. Morphological interpretation of the biopsy is carried out in accordance with the recommendations of the World Health Organization.

◆ Physician or responsible person of the outpatient care organization:

1) upon receipt of a mammography result according to the BI-RADS classification:

- in case of M0t (technical errors in mammography) - sends the patient for a second X-ray examination to the mammography room of the city, district polyclinic (mobile medical complex);
- with M0d (undefined or suspicious X-ray changes requiring additional examination) - sends the patient for in-depth diagnostics to the mammography room of the Cancer Center;

- with M1 (no changes detected) - recommends that the patient undergo a follow-up mammography examination after 2 years. With radiological density of the mammary glands, C and D are sent for ultrasound of the mammary glands to exclude a false-negative result of mammography;

- with M2 (benign changes), refer the patient for a consultation with an oncologist (mammologist) of the clinical diagnostic department, followed by a screening mammography examination after 2 years;

- with M3 (probable benign changes) - sends the patient for short-term dynamic radiation observation to the local doctor with the recommendation of control mammography or ultrasound in 6 months;

- with M4 (signs that cause suspicion of malignancy), M5 (practically reliable signs of malignancy) and if it is technically impossible to perform a trepanbiopsy or a biopsy is refused, a referral to an oncologist (mammologist) of the clinical diagnostic department for dynamic observation and decision on the verification of the identified pathology;

2) upon receipt of the result of a histological examination:

- benign education - refers the patient to an oncologist (mammologist) of the clinical diagnostic department for dynamic monitoring, followed by a screening mammography examination after 2 years;

- formation with an indeterminate malignant potential or carcinoma in situ - refers the

patient to the Cancer Center for consultation and treatment, followed by dynamic observation by an oncologist (mammologist) of the clinical diagnostic department at the place of her attachment;

- malignant neoplasm - refers the patient to the Cancer Center for treatment and follow-up;

3) communicates the results of the screening examination to the patient in any available way (by telephone, in writing, through electronic means of communication);

4) enters the results of double reading, in-depth diagnostics, histological examination, recommendations of the radiologist of the Cancer Center mammography room into the information system.

Establishing the size of the primary tumor is especially important in screening. Tumor size is an important criterion for evaluating the quality of screening and determining the ability of X-ray mammography to detect non-palpable tumors. Therefore, it is extremely important that pathologists measure tumor diameter as accurately as possible. The smaller the size of the primary tumor, the greater the likelihood of error in determining its size.

Let's analyze the results of BC screening. Mammography screening identified 1,570 cases of BC in 2022 (1,402 in 2021). The cancer detection rate increased from 1.78 to 1.94 per 1000 examined. The best result is in the Karaganda region – 2.63 per 1000 women examined. Low detection rate per 1000 examined, compared to the republican average, in Atyrau (1.72), Zhambyl (0.58), Kyzylorda (1.68), Mangistau (0.42 - worst result), Turkestan (1.22) regions and cities Astana (1.5) and Shymkent (1.58). Compared to 2021, there was an increase in the detection of BC in 9 regions, with the exception of Aktobe (decrease from 2.87 to 2.19 per 1000 women examined), Karaganda (from 2.73 to 2.63), Mangistau (from 1.10 to 0.42), North Kazakhstan (from 3.27 to 2.31), Turkestan (from 1.36 to 1.22) regions and cities Astana (from 1.54 to 1.50), Almaty (from 2.24 to 2.18) and Shymkent (from 2.35 to 1.58) [5].

In 2022, the proportion of patients identified during screening studies with early stages of BC (stage 0-I) was 50.2% during screening (in 2021 - 47.9%). A high proportion of stages 0-I BC (over 50%) was recorded in 8 regions (in 8 in 2021): Akmola, West Kazakhstan, Karaganda (70.8% - best result), Pavlodar, North Kazakhstan, Turkestan regions, cities Astana and Shymkent. Low levels of early detection of BC (below 40%) were noted in Aktobe (19.3% - worst result), Zhambyl (34.8%), Kostanay (39.5%), Mangistau (27.3%) regions and Almaty city (37.3%). Localized cancer (0-I and II stages) amounted to 96.2% (2021 - 95.5%), while not a single case was detected in stages III-IV in Atyrau, West Kazakhstan, Zhambyl, Kyzylorda, Mangistau, Pavlodar regions, cities Astana and Shymkent. A total of 46 cases of breast cancer in stage III and 14 in stage IV were identified (52 and 11, respectively) [5].

Epidemiological indicators of CRC in the form of colon cancer and colorectal cancer are considered separately for objective reasons.

Colon cancer with a specific gravity of 5.53% (2021 - 5.2%) in the structure of oncopathology of both sexes of the population has risen to 5th place, in men it remains in 6th place - 5.8% (5.5 %), for women - in the 5th - 5.3% (4.91%) The incidence rate of cancer of this localization in the country in the reporting year increased from 8.8 to 9.95 per 100 thousand population.

The incidence of colon cancer in 10 regions is higher than the national average - 9.95 per 100 thousand population: Kostanay - 20.7 (2021 - 15.9), Pavlodar - 18.8 (15.3), North Kazakhstan - 18, 0 (12.7), East Kazakhstan - 16.9 (13.4), Karaganda - 15.4 (15.0), Akmola - 14.6 (10.2), West Kazakhstan - 11.0 (10.1), Abay - 10.0 (9.0) regions and cities Almaty – 12.8 (12.1) and Astana – 10.5 (9.0). As in 2021, colon cancer was detected much less frequently in Turkestan - 3.1 per 100 thousand population (2.7), Kyzylorda - 4.1 (4.6), Zhambyl - 5.5 (5.8), Almaty - 6.3 (4.7), Zhetysay - 6.4, Mangistau - 6.8 (4.9) regions and Shymkent city - 5.0 (4.0) [5].

Rectal cancer in the structure of malignant neoplasms of both sexes retains 7th place in

rank with a specific gravity of 4.9% (2021 - 4.92%), but in men it dropped from 4th to 5th place - 6.1%, for women – from 9th to 10th – 4.0%. The incidence rate per 100 thousand population increased from 8.4 to 8.8.

A high incidence rate was recorded in Kostanay - 17.8 per 100 thousand population (2021 - 16.2), East Kazakhstan - 17.7 (13.9), North Kazakhstan - 15.6 (15.1), Pavlodar – 14.9 (18.1), Karaganda – 13.3 (11.7), Abay – 12.9, West Kazakhstan – 12.9 (9.8), Akmola – 10.3 (13.1) regions and Astana city – 10.3 (9.0). Traditionally, a low incidence of rectal cancer is observed in Mangistau - 3.1 (2.8), Turkestan - 3.3 per 100 thousand population (2.7), Zhambyl - 3.7 (5.1), Kyzylorda - 4, 1 (5.3), Almaty – 5.3 (5.6) regions and in Shymkent city – 5.5 (5.0) [5].

Rectal cancer in the structure of causes of death from malignant neoplasms of the population of both sexes in 2022 remained in 5th place with a share of 5.41% (2021 – 5.41%). In the republic as a whole, the mortality rate from this form of cancer was 3.6 per 100 thousand population (3.87).

The mortality rate per 100 thousand population was higher than the national average in East Kazakhstan - 7.8 (2021 - 8.6) - the maximum level, Pavlodar - 7.5 (7.6), Abay - 5.9, North Kazakhstan - 5.8 (4.3), Kostanay - 4.9 (4.9), West Kazakhstan - 4.8 (4.2), Karaganda - 3.8 (5.2) regions. Below the national average - 3.8 per 100 thousand population, mortality in Aktope - 3.2 (4.1), Almaty - 2.6 (2.6), Atyrau - 2.5 (3.4), Zhetysu - 2, 6, Zhambyl - 3.3 (2.7), Turkestan - 2.1 (1.6), Mangistau - 1.9 (1.2), Kyzylorda regions - 1.8 (2.1) - the lowest figure, and cities Almaty – 3.7 (4.3), Shymkent – 2.6 (2.1).

Colon cancer in the structure of causes of death from malignant neoplasms of the population of both sexes in 2022, as in 2021, ranks 6th, with a share of 5.2% (2021 – 5.0%). At the same time, the mortality rate in the country decreased by 5.6%, from 3.6 to 3.4 per 100 thousand population.

Mortality rates in 10 regions are higher than the national average: East Kazakhstan - 7.1 per 100 thousand population (2021 - 5.1) - maximum level, Pavlodar - 5.6 (6.0), Kostanay - 5.3 (5.6), Akmola – 5.2 (3.8), Abay – 5.1, Karaganda – 5.1 (5.6), West Kazakhstan – 4.8 (4.4), North Kazakhstan – 4.8 (5.0) regions and cities Astana – 3.6 (2.7), Almaty – 4.5 (5.3). Low mortality rates from colon cancer were noted in Kyzylorda - 1.2 per 100 thousand population (2.7) - the best result, Turkestan - 1.3 (1.7), Mangistau - 1.6 (2.6), Aktope – 2.0 (2.5), Zhetysu – 2.4, Zhambyl – 2.5 (3.7), Atyrau – 2.5 (1.8), Almaty – 2.6 (1.8) regions and cities Astana – (2.7), Shymkent – (2.4).

For colon cancer (94.0%) - 100% verification level was achieved in 3 regions (Abay, Almaty and Turkestan regions), high rates in the Astana city (98.5%), Shymkent city (98.0%), Zhambyl (98.4%), Atyrau (98.2%) regions, low – in Akmola region (86.7%), Almaty city (84.3%), in the Kyzylorda region (61.8%) – the worst result since 2017.

For rectal cancer (97.4%) - in 6 regions there is a 100% verification level, the worst level is still in the Kyzylorda region - 85.3%, lower than the republican average in the Akmola region - 92.6%, Aktope region - 96 .8%, Mangystau region - 87.0%, Pavlodar region - 95.3%, Almaty city - 93.2% [5].

The frequency of diagnosis of stage I-II rectal cancer, as a visually accessible localization (68.9% - national average) in the regions, was: in Akmola - 34.6% - the worst result, as in 2021, in the country (2021 - 44.1%), Mangistau - 47.8%, Abay - 53.9%, West Kazakhstan - 59.1%, Almaty - 66.2%, Zhetysu - 68.6%, Karaganda - 65, 7% regions and Shymkent city - 62.9%.

For colon cancer (52.4%), early diagnosis rates are higher in Pavlodar (65.9% - best result), Abay, Aktope, Atyrau, East Kazakhstan, Zhambyl, Zhetysu, Karaganda, Kostanay, Pavlodar, North Kazakhstan, Turkestan regions and Shymkent. The lowest figure (23.5%) is in the Kyzylorda region.

For colon cancer (17.3%), the rates of neglect at stage IV are higher - in Akmola - 31.0% - the worst result (2021 - 20.3%), Zhetysu - 27.3%, Abay - 23.1%, Turkestan - 22.2% (29.1%), Karaganda - 28.1% (28.6%), West Kazakhstan - 18.8% (8.2%), Mangistau - 17.6% (19 .4%) regions

and cities Astana - 18.0% (22.9%), Shymkent - 20.0% (22.7%). The lowest level of neglect is 2.9% in the Kyzylorda region (7.9%).

The proportion of stage IV in rectal cancer (13.1%) is higher in Akmola - 29.6% - the worst result (2021 - 19.4%), Abay - 19.7%, Kyzylorda - 17.6% (9.1%), Karaganda - 16.9% (28.4%), Almaty - 15.6% (17.0%), Kostanay - 14.8% (11.1%), Zhambyl - 13.3% (13.6%) regions and Shymkent city - 14.5% (12.5%). The lowest level of neglect - 6.0% - is in the Atyrau region (12.5%).

Late diagnosis of rectal cancer as a visually accessible localization (stages III-IV) in 2022 amounted to 31.1% (in 2021 - 33.5%).

For rectal cancer, the level of neglect is higher than the national average - 31.1%, the indicators in Akmola - 65.4% (2021 - 55.9%) - the worst result in the country, Mangistau - 52.2% (38.1%), Abay - 46.1% (30.6%), West Kazakhstan - 40.9% (25.4%), Karaganda - 34.3% (46.5%), Almaty - 33.8% (35.7%), Zhetysay - 31.4% (34.1%) regions and Shymkent city - 37.1% (42.9%). The lowest neglect is in the Atyrau region - 12.0% (17.5%).

In the country as a whole in 2022, the five-year survival rate of patients with CRC registered in 2018 decreased to 40.4% (2021 - 52.9% for those registered in 2017); there is a significant dispersion of indicators by region, from maximum - 56.1% (47.5%) in the Kyzylorda region, to minimum - 24.3% (51.5%) in the Aktobe region [5].

Screening of CRC screening is the systematic use of screening studies in an asymptomatic population. The purpose of screening is to identify people with abnormalities suggestive of CRC. These persons in the future need additional examination to clarify the diagnosis. Opportunistic screening is the non-systematic use of screening tests in routine medical practice. A screening program is much more challenging than an early detection program. At the same time, the success of the screening program is largely determined by the awareness of the population and medical workers about the possibilities of early diagnosis of CRC. The feasibility of a screening program is determined by several factors that relate to the disease being screened, the screening test, the characteristics of the population, and the characteristics of the healthcare system.

The first factor is that the disease must be well understood, common enough in the target population to justify screening, have a recognizable early stage; treatment of the disease at an early stage should be more effective than at a later stage.

The second is that the test should be characterized by sufficient sensitivity, i.e. the ability to detect cancer among people with the disease; sufficient specificity - the probability that among people who do not have a disease, the test result will be negative; have a high positive predictive value (positive predictive value) or, in other words, the likelihood that people with a positive test result have the disease; have a high predictive value of a negative result (negative predictive value), i.e. the likelihood that people with a negative test result do not have the disease; security; low cost; and acceptability - the likelihood that people for whom this test is intended will agree to the examination (which to some extent depends on the awareness of the population about the possibilities and importance of early diagnosis).

The third factor is that the healthcare system should be ready for maximum screening test coverage of the target group, have the resources to confirm the diagnosis, appropriate treatment and follow-up of people with positive test results, and regularly conduct screening tests at regular intervals. At the same time, the benefits of screening must outweigh the potential physical and psychological harm and justify the financial costs of its implementation [11].

The factors most significant for the development of CRC are:

- the presence of chronic inflammatory bowel diseases, adenomatous polyps, cancer of other localization, etc.;
- family history (presence of one or two first-degree relatives with CRC or familial diffuse intestinal polyposis);
- the age of men and women over 50 years old, taking into account the fact that more than

90% of patients with colorectal cancer are people of this age (medium risk).

Age, regardless of gender, is an important risk factor for CRC. After the age of 50, the incidence of CRC increases from 8 to 160 per 100,000 population. Thus, people who have reached the age of 50, even in the absence of symptoms, constitute a moderate risk group for CRC.

The second category of increased risk of CRC (20%) is made up of persons with a genetic and family predisposition, suffering from chronic inflammatory bowel diseases, diffuse familial polyposis.

The high-risk CRC group is determined by the so-called Amsterdam criteria (the presence of malignant tumors in two generations, the presence of cancer in a first-line relative under the age of 50 years), in this case, CRC screening should be carried out after the age of 30 years [12].

The degree of individual risk of developing CRC is determined before screening to select the scope of studies and the frequency of their conduct.

The interval for oncological colorectal screening is 1 time in 2 years, target group: men and women aged 50-70 years, with the exception of persons registered at the dispensary for CRC and colon polyposis. At the same time, when forming the target group, one should take into account the absence of severe concomitant diseases, such as the presence of a common malignant neoplasm, cerebrovascular diseases in the stage of decompensation, chronic obstructive pulmonary disease with respiratory failure, cirrhosis of the liver, myocardial infarction with congestive heart failure, diabetes mellitus with vascular complications. and others, which are highly likely to lead to death in the next 10 years.

The first step in screening for CRC is the fecal occult blood test (FOBT). Traditionally, such methods include a benzidine test for occult blood in the feces. This is a biochemical method based on the assessment of pseudoperoxidase activity of hemoglobin. There is ample evidence that invitation to guaiac FOBT screening (gFOBT) reduces CRC mortality by approximately 15% in age-matched average-risk populations.

To ensure the effectiveness of screening with gFOBT, the interval for screening under the national screening program should not exceed two years. To date, there is an immunochemical FOBT method - iFOBT, which is superior in efficiency to gFOBT in terms of the probability of detecting adenoma and cancer. iFOBT has improved analysis performance compared to gFOBT.

Immunochemical (immunochromatographic) examination of feces for occult blood - iFOBT or hemocult test is carried out for all men and women of the target group using an express method, which allows you to get a result within 3-5 minutes, without the participation of a medical worker. However, the evaluation of the test is carried out only by a medical worker in the PHC preventive department.

With a positive analysis of feces for occult blood, the second stage of colorectal screening is performed, which consists in endoscopic examination of the colon - total colonoscopy [6]. At the same time, in this case, this medical manipulation is of a therapeutic and diagnostic nature, since it allows one-stage removal of adenomatous polyps, which, according to various authors, occur in every third subject after 50 years of age. At the same time, women have 20% fewer polyps than men, but they have more right-sided lesions, which are more difficult to detect using fecal blood tests, because they are less traumatic [13,14].

What results were obtained from screening for CRC? In 2022, 937,859 men and women of the target group aged 50 to 70 years were examined during colorectal screening (in 2021 - 920,640) [5].

Colorectal screening revealed 325 cases of colorectal cancer in the reporting year, which is 114 cases more than in the previous year (211 cases). The detection rate increased from 0.23 to 0.35 per 1000 patients examined. Low detection of colorectal cancer was noted in Zhambyl, Karaganda, Kostanay, Kyzylorda, Mangistau, Turkestan - the worst result, East Kazakhstan regions, Astana city - from 0.07 to 0.30 per 1000 examined. The best result is in the North Kazakhstan

region – 0.81 per 1000 examined. Compared to 2021, there was a decrease in the detection of colorectal cancer per 1000 people examined during screening in Karaganda (from 0.22 to 0.21), Kostanay (from 0.29 to 0.28), Mangistau (from 0.20 to 0.12) regions and Astana city (from 0.20 to 0.19).

Colon precancer (adenoma detection rate) was detected in 27.5% of patients who underwent colonoscopy (2021 – 22.8%). The detection rate of precancer in Akmola, Aktobe, Almaty (8.5% is the worst result), West Kazakhstan, Zhambyl, Kostanay, Kyzylorda, Mangistau, Pavlodar, North Kazakhstan, Turkestan regions and cities is lower than the national average Astana and Shymkent. The best result is 36.2% in Almaty city. It should be noted that the planned indicator for the detection of precancer of the colon and rectum in the country for 2022, according to the Comprehensive Plan, was 23.0% and was achieved.

In 2022, the proportion of patients identified during screening studies with early stages of malignant neoplasms (stages 0-I) was 26.2% during colorectal screening (in 2021 - 27.5%).

High early detection of colorectal cancer (above 30%) was noted in Akmola, West Kazakhstan, Karaganda, Kostanay, Kyzylorda, Turkestan regions and Astana city (57.1% - the best result). Not a single case of early cancer has been identified in the Mangistau region. Cases of cancer in stages III-IV detected during screening were registered in Akmola, Aktobe, Almaty, West Kazakhstan, Zhambyl, Karaganda, Kostanay, Mangistau regions and Almaty city. A total of 21 cases of colorectal cancer in stage III and 3 in stage IV were identified (in 2021 - 18 and 5, respectively) [5].

The complex analysis carried out allows us to conclude that satisfactory results of cancer screening can be achieved only with its proper organization, high quality of implementation, active participation in population screening, the use of highly sensitive tests and instrumental methods of preventive examination, as well as subsequent accurate diagnosis of identified tumors and timely treatment. High-quality screening leads to early diagnosis of pedological diseases and malignant pathology in the early stages, which, in turn, increases the effectiveness of treatment and improves the prognosis of the disease. Target groups that, for one reason or another, do not participate in screening should be informed that there are no other methods other than screening that would reduce mortality from malignant neoplasms. Incidence and mortality rates from cervical cancer, breast cancer and colorectal cancer clearly reflect the epidemiological situation with this pathology in the regions of our country.

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THE NEED FOR PALLIATIVE CARE AND QUALITY OF LIFE IN MEDICINE AND ONCOLOGY

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Annotation: The paper highlights modern approaches to the issue of providing and optimizing palliative care to patients in serious condition, as well as studying the quality of life in palliative medicine and oncology. The paper presents the basic principles of assessing clinical symptoms in patients with advanced forms of malignant tumors and their impact on the quality of life of these patients. Aspects of studying quality of life in clinical research and clinical practice are described. It has been shown that the method of assessing the quality of life, being a simple and reliable way to determine the impact of the disease on the patient's condition, can increase the effectiveness of palliative treatment.

Key words: palliative care, palliative medicine, palliative oncology, quality of life, questionnaire.

Palliative medicine is a system of comprehensive care for incurable patients, the main goal of which is to achieve the best quality of life for patients, control pain and other symptoms that aggravate their condition, as well as solve psychological and social problems. Dynamic monitoring of quality of life allows for full monitoring of the condition of an oncology patient and adequate correction of symptomatic and supportive therapy programs [1,2].

A very important study on the identification of problems in the use of palliative care (PC) at home for patients with serious illnesses was conducted by Enguidanos S., Rahman A. [3]. They note that, palliative care (PC), a patient-centered approach that provides pain and symptom

management and psychosocial and spiritual support, has strong evidence of improved outcomes for patients who are seriously ill. PC, a patient-centered approach that provides pain and symptom management and psychosocial and spiritual support, has strong evidence of improved outcomes for patients who are seriously ill. In 2017, authors received funding from PCORI to conduct a randomized controlled trial (RCT) to test the effectiveness of an evidence-based model of home-based PC (HBPC) for patient and caregiver outcomes. This HBPC was provided by community HBPC agencies selected by the accountable care organizations (ACOs) and paid for by insurance partner. Researchers had aimed to randomly assign 1155 patients who were seriously ill (and approximately 884 of their caregivers) and receiving care from 10 ACOs in California to 1 of 2 trial groups: HBPC or enhanced usual care. For the latter, usual primary care would be enhanced through additional training in PC principles. After 3 trial modifications and 20 months of attempting to engage primary care physicians (PCPs) and patients in the trial, authors closed the RCT in April 2019 because of insufficient enrollment. Instead, researchers applied for and received permission to change scope of work with the aim of exploring challenges and facilitators to engaging a range of stakeholders in both research and HBPC.

Colleagues in their study aimed to inform PC practice, research, and policy by documenting the challenges of and facilitators to referring patients to HBPC, understanding acceptance of HBPC, and participating in research among multiple stakeholders—namely, patients and caregivers, HBPC agencies, PCPs, and California ACO leaders. Researchers conducted a qualitative study that employed both individual interviews and focus groups to identify challenges and facilitators to engaging stakeholders in PC and in research studies. Working with stakeholder advisory committee members and clinical partners, authors developed semistructured interview protocols for each stakeholder group. The participants in this study had been involved in the original RCT. For the revised study, our colleagues recruited patients and caregivers from individuals who had enrolled in the original trial, who had refused to enroll in the trial and to accept its services, or who had been eligible but declined trial enrollment.

Authors recruited PCPs from our California ACO trial partners. These included PCPs who had been involved in the trial as well as those who did not engage in the enhanced usual care training and/or had opted out of having their patients referred to the trial. Researchers recruited ACO leaders from California-based medical groups that had been intended to be part of our trial. Authors also conducted focus groups at participating HBPC agencies. All interviews were recorded and transcribed verbatim. They used grounded theory to analyze the interview responses. Two investigators individually coded the transcripts and compared codes and categories throughout the process. The final codes for all transcripts were compared, discussed, and then reconciled as needed to reach at least 90% agreement between coders. Using the constant-comparison method, authors compared codes and categories within interviews and also triangulated across participant types (i.e., ACO leadership vs HBPC team vs provider vs patient/caregiver) to determine areas of consistency and divergence.

Researchers shared the findings with our stakeholder advisory committee and integrated the feedback into our findings. As a result, the authors of this study recruited patients (n = 17) and caregivers (n = 8) who either had refused to enroll in the trial or to accept trial HBPC services, and patients and caregivers (n = 10) who had enrolled in the trial. They recruited 30 PCPs from our ACO trial partners and 12 ACO leaders. Finally, researchers conducted 9 focus groups with HBPC agencies that had agreed to be partners for the trial.

Themes relating to challenges in identifying and enrolling patients in HBPC and in research included (1) limitations of patient recruitment strategies (i.e., reliance on PCPs for referrals and the use of potential patient lists generated by claims data); (2) engagement timing (i.e., insurance partner timing related to rolling out HBPC for all eligible beneficiaries, medical groups' experience with PC, and patient timing related to level of illness or current care demands); (3) a lack of PC

health literacy (i.e., PCP, patient, and caregiver lack of knowledge of PC and/or conflating PC with hospice care); and (4) the novelty of the HBPC market (i.e., lack of universal funding for HBPC, lack of structure and standardization among HBPC programs, and a competitive market vying for the care of patients who are seriously ill). These themes emerged both when we asked respondents about participating in research trials, particularly HBPC trials, and when we asked about engaging with HBPC.

Researchers also identified 3 themes related to potential strengths in engaging stakeholders in HBPC: (1) developing relationships (i.e., HBPC agencies forging relationships with physicians and health care staff to obtain patient referrals for HBPC); (2) warm hand-off of patients (i.e., physicians informing patients of research or referring patients directly to HBPC); and (3) rebranding HBPC/separating the HBPC line of business from hospice programs (i.e., developing a new line of business for HBPC away from the existing hospice line of business). Authors also identified warm hand-offs as a successful strategy for engaging patients in research studies. The findings from results of this study can inform HBPC researchers of problematic approaches in patient/caregiver and PCP engagement. These findings also highlight the difficulty of identifying potentially eligible patients for HBPC. Successful strategies used to identify and refer HBPC patients may help inform HBPC agencies and their practices. Finally, national strategies are needed to overcome low levels of PC knowledge and confusion between hospice care and PC among health care providers and patients and their caregivers. These findings are based on the perspectives of a purposive sample of PCPs and administrators associated with California-based ACOs. Patient and caregiver participants had been eligible for the originally planned trial; their insurance company (i.e., Blue Shield of California) covered HBPC services. Their responses may have been influenced by their exposure to the original trial's recruitment efforts and to HBPC.

In another study on optimizing the global nursing workforce to achieve universal access to palliative care and alleviate serious health-related suffering worldwide, authors point out that, PC access is fundamental to the highest attainable standard of health and a core component of universal health coverage [4]. Forging universal PC access is insurmountable without strategically optimizing the nursing workforce and integrating palliative nursing into health systems at all levels. The COVID-19 pandemic has underscored both the critical need for accessible PC to alleviate serious health-related suffering and the key role of nurses to achieve this goal.

In their work, the researchers set the following goals: 1) summarize palliative nursing contributions to the expansion of palliative care access; 2) identify emerging nursing roles in alignment with global palliative care recommendations and policy agendas; 3) promote nursing leadership development to enhance universal access to palliative care services.

As a result of the study, the following data were obtained: nurses working across settings provide a considerable untapped resource that can be leveraged to advance PC access and PC program development. Best practice models demonstrate promising approaches and outcomes related to education and training, policy and advocacy, and academic-practice partnerships. An estimated 28 million nurses account for 59% of the international healthcare workforce and deliver up to 90% of primary health services. It has been well-documented that nurses are often the first or only healthcare provider available in many parts of the world. Strategic investments in international and interdisciplinary collaboration, as well as policy changes and the safe expansion of high-quality nursing care, can optimize the efforts of the global nursing workforce to mitigate serious health-related suffering.

Kitreerawutiwong N. et al. conducted a comprehensive review of the methods used to determine the prevalence of PC needs [5]. As the authors note, early identification of PC needs is crucial to provide appropriate holistic care to patients. The aim of this integrative review was to synthesize the methods used to determine the prevalence of need for PC. An integrative review search of the Cumulative Index to Nursing and Allied Health Literature (CINAHL) Plus with full text,

ProQuest, Wiley InterScience, ScienceDirect, Scopus, PubMed, and Web of Science with publications from 2010 to 2020 was carried out in English. Empirical studies examining the methods used to determine the prevalence of PC needs were included. The methods of data extraction of the included articles were categorized by data source, study setting, and data collector. Quality appraisal was performed using QualSyst.

Of the 5,410 articles screened, 29 were included in this review. Two articles identified the prevalence of PC needs in a community that was supported by a network of volunteers, while 27 studies considered this at a continent, country, hospital, and/or primary care facility level as represented by physicians, nurses, and researchers.

In conclusion, the authors emphasize that different methods were used to determine the prevalence of PC needs, and the results are valuable for developing PC services when allocating resources at the national and community levels. Future research to identify PC needs across health settings, especially primary care facilities, should consider providing PC across a spectrum of care settings.

Also, a very relevant issue was touched upon in their work by Kozhevnikov D. et al. [6]. It concerns simulation training in PC. In their work, our colleagues note that the growing need for PC among patients with serious illness is outstripped by the short supply of PC specialists. This mismatch calls for competency of all health care providers in primary PC, including patient-centered communication, management of pain and other symptoms, and interprofessional teamwork. Simulation-based medical education (SBME) has emerged as a promising modality to teach key skills and close the educational gap. This paper describes the current state of SBME in training of PC skills. Authors conducted a systematic review of the literature reporting on simulation experiences addressing PC skills for clinical learners in medicine and nursing. Researchers collected data on learner characteristics, the method and content of the simulation, and outcome assessments.

In a total of 78 studies, 76% involved learners from medicine and 38% involved learners from nursing, while social work (6%) and spiritual care (3%) learners were significantly underrepresented. Only 16% of studies involved collaboration between participants at different training levels. The standardized patient encounter was the most popular simulation method, accounting for 68% of all studies. Eliciting treatment preferences (50%), delivering bad news (41%), and providing empathic communication (40%) were the most commonly addressed skills, while symptom management was only addressed in 13% of studies. The most common method of simulation evaluation was subjective participant feedback (62%). Only 4% of studies examined patient outcomes. In 22% of studies, simulation outcomes were not measured at all.

In doing so, the authors provide a thorough description of the current state of SBME in PC education, highlighting advances over recent decades and identifying gaps, opportunities for future directions, and recommending that SBME for a broader range of learners and for interprofessional skill building. be developed for a broader range of learners and for interprofessional skill development. They also advocate for expansion of skill content, especially symptom management education. Finally, evaluation of SBME in PC education should be more rigorous with a shift to include more patient outcomes.

As for oncological diseases, today the problem of high morbidity and mortality from this pathology is global. At the same time, it is known that the main burden of therapeutic and moral responsibility for patients with advanced forms of malignant neoplasms, who make up clinical group IV and for whom only supportive (palliative) treatment is carried out primarily at diagnosis or in the process of treatment as the disease progresses, lies with district oncologists, general practitioners, general practitioners at local clinics and doctors at PC centers (hospice). At the same time, it is often difficult to adequately assess the patient's true condition, which is associated with many objective and subjective factors (such as, for example, individual pain threshold, etc.).

The characteristics and degree of influence of various symptoms on the quality of life in modern PC practice are based on the patient's perception and are carried out using special tools. The main requirements for questionnaires used in palliative medicine are fully applicable to questionnaires for assessing symptoms. At the same time, accurate assessment and measurement of symptom intensity in clinical trials allows us to study the mechanisms of symptom formation and compare the effectiveness of treatment methods. Assessment of quality of life is widely used in clinical practice, because here, as in clinical studies, an accurate and adequate assessment of the patient's condition, his response to treatment, PC programs and symptomatic therapy is necessary. In clinical practice, this method makes it possible to monitor the dynamics of symptoms, investigate the cause and mechanisms of their occurrence, develop an adequate treatment plan, and also determine the effectiveness of the treatment measures taken. Symptom assessment tools include both questionnaires for assessing individual and main symptoms, and single scales (verbal rating scales, visual analogue and digital rating scales). The most commonly used symptom assessment questionnaire in PC is the Edmonton Symptom Assessment System - ESAS, which allows assessing the manifestation of 9 leading symptoms found in cancer patients: fatigue, pain, nausea, depression, anxiety, loss of appetite, drowsiness, shortness of breath and general impairment. well-being [7,8].

Assessing quality of life in palliative medicine in general and in palliative oncology in particular has its own characteristics. First of all, this concerns the choice of an instrument for assessing quality of life. Such questionnaires are developed taking into account the following characteristics: the presence of problems associated with the symptoms of the disease, the characteristics of the physical and psychological status of patients and the patients' limited ability to concentrate. In this regard, tools for assessing quality of life in palliative medicine should be simple, concise and easy to fill out. The patient fills out the questionnaire himself (self-assessment) and only if this is not possible - with the help of relatives or medical personnel (proxy assessment). But it must be taken into account that the latter option for assessing symptoms has low reliability. The most common and frequently used questionnaires in palliative oncology include the EORTC QLQ-C15-PAL (European Organization for Research and Treatment of Cancer Palliative Care Questionnaire) [9,10] and FACT (Functional Assessment of Cancer Therapy) [11,12].

The great potential of the method for assessing the quality of life lies both in determining the severity of pathological symptoms and in the method of individual monitoring of the condition of an oncological patient (assessment of the overall quality of life and various functional indicators over a long period of observation). At the same time, the basic principles for assessing leading symptoms are as follows: 1) assessment of the symptom(s) obtained with the help of the patient; 2) use of special tools for assessing symptoms (scales and questionnaires); 3) assessment of the symptom(s) over time; 4) documenting all stages of symptom assessment.

The method of assessing the quality of life in clinical practice allows for timely correction of palliative treatment in order to increase its effectiveness, thereby ensuring adequate psychological and social assistance and the highest possible level of quality of life for the doomed patient during the entire observation period.

In conclusion, it should be noted that the need for PC is great. Today, this area is one of the priorities, both in oncology and in medicine in general. The developed clinical approaches to optimizing algorithms for providing full PC to incurable patients indicate positive trends in this complex area of health care. At the same time, quality of life indicators have an independent prognostic value in determining the response to palliative treatment and patient survival. There is data on the relationship between the quality of life and survival of severe patients, including cancer. In other words, assessing the quality of life is a simple and reliable method for determining the impact of the disease on the patient's condition, including his physical, psychological and emotional status. In addition, qualitative and quantitative indicators of quality of life can be used

to determine an individual prognosis and develop rehabilitation programs of psychological and social support for a particular patient.

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ТРАНСКРАНИАЛЬНАЯ МАГНИТНАЯ СТИМУЛЯЦИЯ: КЛИНИЧЕСКОЕ ПРИМЕНЕНИЕ И НАУЧНЫЕ ПЕРСПЕКТИВЫ

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Транскраниальная магнитная стимуляция (ТМС) - это метод стимуляции нервов и нейромодуляции, основанный на электромагнитной индукции электрического поля в определенной области мозга.[70] Начиная с 90-х годов XX века интерес к ТМС неуклонно растет, поскольку метод является неинвазивным и потенциально обладает широким спектром диагностических и терапевтических возможностей: согласно базе данных PubMed, количество публикаций по ТМС увеличилось с 67 в 1990 году до 8699 в 2012 году.

"Предшественником" TMS был метод US electrical system (tes), разработанный в 1980 году. TES способен регистрировать моторные вызванные потенциалы (двигательные реакции периферических мышц) в ответ на стимуляцию моторной зоны коры головного мозга через неповрежденную ткань волосистой части головы, что позволяет оценить функциональную целостность кортикального отдела спинномозгового тракта на всем его протяжении. Болезненность этой процедуры резко ограничивает возможность использования ТЭС в клинических условиях; ТЭС проводится с целью интраоперационного мониторинга во время операций на позвоночнике и головном мозге у пациентов под общим наркозом. За последние 80 лет развитие метода ТМС было описано следующим образом. С тех пор было проведено множество исследований этого метода, предложены новые технологии TMS и новые устройства. В 1996 году Национальные институты здравоохранения США (National Institutes of Health, или NIH) впервые разработали клинические рекомендации по использованию TMS, адаптированные в 1999 году. Международная федерация клинической нейрофизиологии (International Federation of Clinical Neurophysiology). В 2008 году Руководство NIH было обновлено, чтобы обеспечить наиболее полное руководство по безопасности и клиническим аспектам использования тысячи ТМС.

Физическая инфраструктура и параметры ТМС

Компания TMS была основана в 1831 году всемирно известным физиком М. А. Тмсом. Она основана на взаимосвязи между электрическим и магнитным полями и явлении электромагнитной индукции, открытом Фарадеем. В определенную область мозга устанавливается электромагнитная катушка, и на короткое время разряжается мощный магнитный стимулятор (конденсатор), после чего генерируется ток в несколько тысяч ампер. Этот ток создает поле, перпендикулярное направлению тока в катушке, напряженность которого достигает 1,5–2 тесла (тл), а длительность составляет 100 мс. Динамически изменяющееся магнитное поле свободно проникает в череп на глубину 1,5–3 см и индуцирует электрическое поле в тканях головного мозга (параллельно, но в направлении, противоположном току электромагнитной катушки). Под воздействием индуцированного электрического поля мембраны кортикальных нейронов деполяризуются с появлением

потенциалов действия и распространением возбуждения в стимулируемых участках коры головного мозга.

Таким образом, хотя и ТЭС, и ТМС вызывают деполяризацию нейронов, генерируя электрические поля в паренхиме головного мозга, механизмы, вызывающие электрические токи, различны. Очевидным преимуществом ТМС перед ТЭС является то, что активация болевых рецепторов в тканях кожи головы значительно ниже, что делает возможным применение этого метода у бодрствующих пациентов. Кроме того, с помощью ТМС можно исследовать не только двигательные, но и немоторные области коры головного мозга.

Характеристики электромагнитного поля при ТМС зависят от формы, размера, конструкции электромагнитной катушки (змеевика) и ее ориентации по отношению к голове пациента, параметров стимуляции. Чаще всего используются кольцевые катушки разного диаметра, катушки цифрой 8 (в виде "бабочки") в виде буквы N используются с помощью локальной (до 0,5 см) стимуляции образований головного мозга, расположенных близко к поверхности волосистой части головы, таких как кора головного мозга, мозжечок и т.д. Спираль расположена по касательной к волосистой части головы, но возможность стимуляции нервных структур наиболее велика в областях, которые ориентированы параллельно центральному сегменту катушки. Стимуляция более широкой области осуществляется с помощью круглых катушек, а использование специальных H-образных катушек позволяет стимулировать глубокие структуры головного мозга (гиппокамп, подкорковые образования, ствол головного мозга).

ТМС может быть выполнена с использованием одного стимула (режим одиночного импульса), пары стимулов или серии импульсов (повторяющиеся ТМС или Pmts). Например, одиночные стимулы используются для картирования двигательных областей коры головного мозга и изучения времени центрального проведения двигательных реакций, а парные импульсы используются для определения механизмов в коре головного мозга.[13, 39, 45, 68]. ТМС серией импульсов широко используется в терапевтических целях, при регулярной повторной подаче одного стимула (так называемая стандартная или "конвенциональная" ТМС) или при стимуляции баланса паттерн ТМС представляет собой короткую серию высокочастотных импульсов, разделенных паузой, например, протокол тета-всплеска повторяется с определенной частотой. в тета-диапазоне (5 Гц) в постоянном или прерывистом режиме. Включая подачу коротких пачек импульсов с частотой 50 Гц для обратной связи. В последние годы была предложена новая парадигма применения ТМС, предполагающая воздействие на одну и ту же область мозга стимулами разной частоты, что дает двусторонние эффекты. Безопасные параметры стимуляции подробно описаны в специальном руководстве.

Нейрофизиологические и биологические эффекты ТМС

Потенциалы действия, возникающие в нейронах под воздействием импульсов ТМС, могут распространяться по аксонам и активировать множество окружающих нейронов различной модальности через синапсы. Таким образом, под воздействием ТМС в мозге могут возникать как кратковременные возбуждающие, так и тормозящие эффекты, и стимуляция может вызывать оба этих эффекта, возможно, в зависимости от их интенсивности и продолжительности. Еще в 90-х годах было показано, что воздействие ПТМС на частотах ниже 5 Гц оказывает возбуждающее действие, в то время как на частотах от 0,2 до 1 Гц оно оказывает подавляющее действие. Дальнейшие эксперименты на кошках с изучением метаболической активности в затылочной коре сразу после сеанса ПТМС подтвердили зависимость уровня процессов торможения и возбуждения в головном мозге от частоты стимуляции [84]. Однако идея о том, что быстрая ПТМС обладает физиологическим эффектом возбудимости, а медленная ПТМС обладает ингибирующим действием, очень

упрощена и всегда находит свое подтверждение, а на характер нейрофизиологического сдвига большое влияние оказывает режим стимуляции. Таким образом, стимуляция в прерывистом режиме тета-всплеска (2 секунды стимуляции и 10 секунд паузы) приводит к повышению возбудимости, а постоянная (40 секунд) стимуляция в том же режиме приводит к ее снижению.

На клеточном уровне тормозящий или возбуждающий эффект ТМС объясняется деполяризацией мембран кортикальных нейронов под воздействием индуцированного электрического поля, появлением трансмембранных ионных токов и потенциалов действия с последующей синаптической передачей возбуждения в нейронные сети, функционально или анатомически связанные с областью стимуляции.

Состояние эндокринной системы заслуживает особого внимания как потенциальный фактор, который может объяснить некоторые физиологические эффекты ТМС. Многие исследования показали, что воздействие ТМС приводит к кратковременному повышению содержания тиреотропного гормона (ТТГ) в плазме как у здоровых людей, так и у пациентов с депрессией, в то время как подпороговая стимуляция косвенно приводит к кратковременному повышению уровня ТТГ и кортизола в плазме добровольцев, что указывает на расслабляющий эффект подпороговой ТМС у здоровых людей.

ТМС также может оказывать модулирующее воздействие на иммунную систему, вегетативный контроль функций и церебральную гемодинамику (реактивность сосудов головного мозга). Ритмичные ТМС могут оказывать не только мгновенный, но и отсроченный эффект, в основе которого, вероятно, лежит процесс нейропластичности (модификация синапсов под влиянием периодически повторяющихся воздействий, выработка нейротрофических факторов).

Вопросы безопасности

Нагрев мозговой ткани под воздействием однократного импульса ТМС очень мал, менее 0,1°C, но при глубокой стимуляции мозга нагрев ткани вокруг электрода достигает 0,8. Согласно патогистологическим и нейровизуализационным исследованиям, структурные изменения в тканях в области стимуляции не развиваются.

Побочные эффекты при применении ТМС в рекомендуемых дозах и режимах встречаются редко и включают головную и местную боль, обмороки, нарушение слуха, эпилептические припадки и психические расстройства. Эпилептические припадки являются наиболее серьезным осложнением, но риск их развития очень низок, даже у пациентов с эпилепсией - всего 1,4%. Большинство случаев, описанных в литературе, относятся ко времени, когда безопасные параметры стимуляции еще не были установлены: приступы обычно происходят при слишком частой стимуляции, а патофизиологической основой залпового огня, вероятно, является чрезмерная синхронизация группы нейронов и дисбаланс между возбуждающей и тормозящей активностью синапсов. Факторами риска возникновения судорог являются прием противоэпилептических препаратов, недостаток сна. Наиболее распространенными побочными эффектами ТМС, как механизма, являются умеренная локальная боль или дискомфорт в раздраженной области (до 40%) и головная боль (до 30%).

Его развитие включает стимуляцию ветвей тройничного нерва и мышечных спазмов. Кроме того, магнитная стимуляция вызывает высокочастотный шум, который может вызвать кратковременные изменения порога слышимости. Результатом тщательного изучения всех возможных побочных эффектов и осложнений ТМС стала специальная анкета из 15 вопросов, которая позволила провести скрининг кандидатов на ТМС, а также противопоказаний, разработанных Национальным институтом здравоохранения для использования этого метода [70]. К противопоказаниям относятся, в частности, нахождение металлических предметов вблизи магнитных катушек (слуховых имплантатов, насосов, вживленных электродов), эпилепсия, сосудистые, травматические, опухолевые или

инфекционные поражения головного мозга, недостаток сна, поскольку ТМС используется в лечебных и диагностических целях в клинической практике и научных исследованиях. Независимо от цели использования ТМС, субъект/пациент должен быть ознакомлен с возможными побочными эффектами ТМС и подписать информированное согласие перед процедурой.

Клиническое применение метода ТМС

Показания к терапевтическому применению ТМС ограничены из-за неоднозначности результатов клинических исследований этого метода: на сегодняшний день он превосходит плацебо по эффективности при определенных видах патологии; кроме того, в большинстве исследований не проводился надлежащий анализ эффекта плацебо и реальной эффективности этого метода ставится под сомнение. В настоящее время в Соединенных Штатах, Канаде и некоторых европейских странах единственным одобренным показанием к применению ТМС в терапевтических целях является депрессия с лекарственной устойчивостью.; В то же время Управление по контролю за продуктами и лекарствами США (U.S. Food and Drug Administration, или FDA), Министерство здравоохранения Канады и европейские медицинские учреждения разрешают использование только определенных устройств в фармацевтических целях с указанием конкретных названий производителей и систем стимуляции. Потому что нейровизуализационные исследования при депрессии показали снижение метаболизма в области левой дорсальной латеральной префронтальной коры (DLPFC)., При лечении рефрактерной депрессии чаще используется стимулирующее (высокочастотное) воздействие серией импульсов на левую ДОЛПК (например, частота стимуляции составляет 10 Гц, ежедневно, 5 раз в неделю, 2-6 недель). Реже используется низкочастотная ингибирующая стимуляция или двусторонняя стимуляция правого DLPFC. Параметры, локализация и продолжительность стимуляции еще не стандартизированы. Эффективность ТМС в лечении депрессии была подтверждена рандомизированными исследованиями. Метаанализ данных, в котором сравнивались 34 плацебо-контролируемых исследования и 6 тмс с электросудорожной терапией при депрессии, показал, что тмс была значительно более эффективной в лечении депрессии, чем плацебо. В то же время монотерапия ТМС оказалась более эффективной, чем комбинация ТМС и антидепрессантов, но менее эффективной, чем электросудорожная терапия депрессии. По некоторым данным, наилучшего эффекта с помощью ТМС можно добиться у молодых людей. Не все исследования и не все обзоры подтверждают терапевтический эффект ТМС при депрессии. Негативные последствия могут быть связаны с ограниченными базовыми знаниями о параметрах ТМС, используемых при лечении депрессии. Показаниями к диагностическому применению ТМС в клинической практике в настоящее время являются 2 основные стратегии получения информации о кортикальной локализации ограниченных функций при картировании двигательных и речевых областей коры головного мозга в предоперационном периоде нейрохирургического вмешательства в головной мозг: (1) регистрация активности мозга во время выполнения задания (пассивная) и (2) наблюдение за эффектом индуцированной/подавленной нейронной активности в определенных областях коры головного мозга.

Первая стратегия реализуется с использованием электроэнцефалографии (ЭЭГ), позитронно-эмиссионной томографии (ПЭТ), функциональной магнитно-резонансной томографии (МРТ) и 2-й ТМС. Преимуществом последней является минимальная зависимость результата от совместных усилий испытуемого. Возможность изучения внутрикорковых взаимодействий и выявления специфических областей коры головного мозга, которые очень важны для выполнения различных функций того или иного органа.

С целью картирования функций мозга используется однократный стимул ТМС. Для изучения мышечного представительства коры головного мозга на кожу головы помещают индуктор в

соответствии с проекцией первичной моторной коры с привязкой системы координат к вектору. В ответ на один-единственный стимул в моторной коре головного мозга возникает залп нисходящих волн возбуждения, которые следуют за альфа-мотонейронами спинного мозга, а оттуда по периферическим нервам к мышцам-мишеням на противоположной стороне тела. Путем регистрации мышечных сокращений (моторных вызванных потенциалов), таких параметров, как моторный порог (минимальная напряженность магнитного поля, необходимая для достижения моторных вызванных потенциалов в целевых мышцах), латентность вызванной моторной реакции, время проведения центральной моторной реакции (разница в латентности реакции кортикальной и шейной ТМС), амплитуда и форма вызванная двигательная реакция может быть изучена. Стимуляция различных участков волосистой части головы позволяет точно определить границы кортикального представительства скелетных мышц, поскольку целенаправленная подача магнитных импульсов может вызывать изолированные движения 1 пальца. Предоперационное ТМС-картирование у пациентов с опухолями головного мозга - это своевременное выявление изменений в двигательной зоне, обусловленных анатомической и физиологической перестройкой функций, вызванной опухолями.

Картографирование речевой зоны не очень разработано, но эта область активно развивается. Еще в 90-х годах было обнаружено, что локальное воздействие магнитных полей на речевые зоны может привести к нарушениям речевых функций. Чтобы составить карту голосовых функций с помощью метода TMS, пациентам предлагаются различные голосовые тесты и оценивается динамика результатов при воздействии TMS. Так, Т.Пичт и соавторы обследовали 20 нейрохирургических пациентов с поражением левого полушария и представили тест на называние предметов; была показана высокая степень соответствия между результатами, полученными при предоперационном ТМС-картировании и интраоперационном картировании (в момент пробуждения пациента).

Таким образом, с помощью ТМС его можно безопасно удалить во время резекции опухолей или эпилептогенных поражений, без риска развития послеоперационных неврологических дефектов. Точность прогноза соответствует данным, полученным при инвазивном картировании функций головного мозга во время прямой внутричерепной электростимуляции. Основная проблема заключается в том, что из-за значительных индивидуальных различий точки стимуляции не могут быть точно соотнесены с анатомическим строением мозга. Таким образом, хотя опорная зона при картировании коры головного мозга является основной двигательной областью большого пальца, она имеет существенные индивидуальные различия, и локализация областей мозга, связанных с этим местоположением, дополнительно изменяется из-за различий в размере головы и морфологии коры головного мозга. Оборудование нового поколения, использующее навигационную систему и сочетающее в себе ТМС и ФМРТ, может значительно повысить точность картографирования и создать структурные и функциональные карты мозга.

Эпилепсия

Некоторые режимы PTMs (например, низкочастотный PTMs ≤ 1 Гц или постоянный TMS в режиме тета-залпа) могут подавлять возбуждение в коре головного мозга, возможно, в результате регуляции активности γ -аминомасляной кислоты (ингибирующего медиатора) и повышения порога судорожной готовности. В связи с этим была рассмотрена способность тмс быстро купировать приступы – например, при локальных эпилептических состояниях, постоянной парциальной эпилепсии. При локально регулируемой эпилепсии ТМС может воздействовать непосредственно на корковый очаг эпилептической активности или подкорковый очаг на прилегающие области коры, но не во всех, значительное количество исследований показало снижение частоты эпилептических припадков при воздействии ТМС,

и, кроме того, все они являются рандомизированным плацебо-контролем. Дело не в том, что я не фанат игры. В некоторых случаях низкая эффективность ТМС объяснялась неточностью попадания в очаг эпилептогенности; возможно, современные навигационные системы улучшат результаты лечения.

Хроническая боль

Применение ТМС у людей с хроническим невропатическим болевым синдромом, фибромиалгией и сложным локальным болевым синдромом (местом воздействия обычно является первичная соматическая моторная кора) дало многообещающие результаты. Подавление боли является результатом уменьшения патологического внутрикоркового торможения в контралатеральном полушарии, активации структуры лимбической системы и ядра таламуса, за которым следует модуляция нисходящего импульса.

Научный потенциал диагностических приложений TMS

Как неинвазивный метод исследования, ТМС предоставляет уникальную возможность изучить локализацию изменений в функционировании головного мозга и функциональных взаимосвязей в коре головного мозга при различных клинических состояниях. Например, ТМС может помочь локализовать процессы запоминания. Таким образом, воздействие однократной импульсной ТМС на левый DLPC нарушало запоминание испытуемыми букв, в то время как низкочастотная ТМС изменяла их способность запоминать слова, но не лица. ТМС с парными импульсами, длящимися с интервалом в 100 миллисекунд, разрушали рабочую память во время теста на запоминание прочитанного слова. Эти исследования подтверждают роль левой дорсолатеральной префронтальной коры в процессе хранения информации. Технология TMS позволяет исследовать другие когнитивные функции. Например, было обнаружено, что нарушения в зрительно-пространственном планировании поведения в соответствующем тесте возникали при низкочастотных ТМС правой или левой префронтальной коры (не теменно-затылочной!). Кора головного мозга; ПТМС в затылочной доле нарушали распознавание зрительных стимулов; избирательная стимуляция зоны Вернике улучшала когнитивные функции и сокращала время ожидания при назывании изображений.

Современные технологии (использование электроэнцефалографии, функциональной МРТ, ПЭТ в сочетании с ТМС) позволяют выявить основные эффекты ТМС и роль различных параметров стимула (локализация, интенсивность, частота) в регуляции этих эффектов. Функциональные изменения в коре головного мозга были продемонстрированы при различных типах патологии. ТМС может оказать важную помощь в понимании взаимосвязи между мозгом и поведением и может оценить поведенческие эффекты стимулов в немоторных областях мозга. Все это очень важно для понимания функциональных тканей человеческого мозга и разработки новых стратегий реабилитации. Таким образом, ТМС - это неинвазивный метод нейростимуляции с большим диагностическим и терапевтическим потенциалом. Необходимо дальнейшее изучение механизма воздействия переменных магнитных полей на головной мозг, уточнение оптимальной локализации магнитных катушек и параметров стимуляции при различных формах патологии, изучение величины и стойкости достигнутого эффекта, а также оценка риска лечения. Решая эти задачи, мы можем расширить показания к клиническому применению ТМС и углубить наше понимание патофизиологии нервно-психических расстройств.

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Art History

The Importance of Socially Significant Films in the Film Industry

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Socially significant films play a crucial role in the contemporary film industry, serving as an important tool for shaping public consciousness, exchanging cultural values, and stimulating global social changes. This article examines the role of social cinema in the context of globalization, the impact of film on international public opinion, and the challenges faced by creators of socially significant films worldwide. Special attention is given to potential solutions to these problems, which could ensure the further development of social cinema as a key element of international cultural and social policy.

In the context of a globalizing world, cinema has become not only an important cultural and entertainment tool but also a powerful means of shaping public consciousness and stimulating social change. Socially significant films, which address key contemporary issues such as human rights, social inequality, ecology, migration, racism, and others, have a global potential to influence international public opinion and address urgent world problems. These films can serve not only as indicators of global trends but also as catalysts for change in different countries and cultures.

However, despite their importance, social cinema faces a number of challenges on the international stage. These issues require comprehensive solutions aimed at supporting and developing socially significant cinematic works in a global context.

Modern cinema, oriented towards mass profit, often limits opportunities for the creation of socially significant films, especially those that do not conform to universal commercial standards. In an environment dominated by major studios and multimedia corporations, films addressing important social issues but lacking guaranteed commercial success often remain in the shadows. This complicates their production and hinders their distribution on an international scale, particularly in countries with limited cultural resources.

An example of this is the situation with independent documentaries, which often face difficulties in securing funding due to limited budgets and challenges in achieving commercial success. At the same time, cultural diversity, which is an important aspect of the global film industry, is often ignored in commercialized projects, limiting opportunities for exploring social issues specific to different regions of the world.

Censorship and Political Barriers

One of the most serious problems faced by socially significant films on the international stage is censorship. In different countries, censorship policies can vary significantly, and in some

cases, social cinema is subjected to strict restrictions, particularly if it addresses controversial topics such as political repression, minority rights, or environmental issues.

Many filmmakers encounter difficulties when trying to present the truth about social issues in countries where freedom of speech is restricted. An example of this is political censorship, which limits the import and screening of films that do not conform to state ideologies, as well as projects that could contribute to political instability.

Issues of International Accessibility and Localization

In the context of globalization, an important issue is the accessibility of socially significant films to international audiences. While films produced in Western countries often reach a wide global audience through international film festivals or streaming platforms, filmmakers from developing countries face distribution and translation challenges.

Socially significant films made in developing countries may be of great value to a global audience, but they often remain inaccessible outside their region due to language barriers and limited access to international distributors. It is essential to create mechanisms to improve the accessibility of such films and overcome the barriers to their international distribution.

Socially significant films can not only shed light on important global issues but also significantly contribute to global changes. Cinema, as a form of art, has a unique ability to influence mass consciousness, shape public opinion, and mobilize international audiences to address global challenges.

Shaping Global Public Consciousness

Social cinema can play a key role in the creation of a unified global community, bringing people together around common issues. For example, films about human rights, such as *The Act of Killing* (2012), which addresses the mass killings in Indonesia, or *An Inconvenient Truth* (2006), which raises issues of global warming, show how important it is to understand and respect the rights of others for the sustainable development of a global society.

Global Movements and Activism through Cinema

Socially significant films can serve as the foundation for international movements and activism. They inspire viewers to engage in solving social and environmental issues, promoting ideas of social equality, human rights, and sustainable development. For instance, the women's rights movement, which gained significant momentum in the 2010s with the support of films like *Hidden Figures* (2016), which highlighted the important role of women in science, contributed to strengthening the global discussion on gender equality.

The Development of Cultural Exchange and Solidarity

International film festivals such as Cannes, Berlin, and Toronto provide a platform for social cinema, fostering cultural exchange and solidarity between countries. These festivals become key points for spreading ideas and issues that concern all of humanity, regardless of national or cultural differences.

In order for socially significant films to continue impacting international society and solving global problems, a number of steps need to be taken.

Support for International Cooperation and Financing

One of the key solutions is the development of international cooperation and the expansion of funding channels for independent filmmakers. This can include the creation of international funds and grants for films addressing social issues. It is also important to develop partnerships between governments, the private sector, and international organizations to create and distribute socially significant films.

Ensuring Creative Freedom and Combating Censorship

On the international stage, it is necessary to actively defend creative freedom and combat censorship, particularly in countries with authoritarian regimes where social cinema may face severe restrictions. International cultural and human rights organizations should support filmmakers whose works aim to expose human rights violations and highlight social problems.

Developing Infrastructure for Global Accessibility

To improve the accessibility of socially significant films, it is essential to develop infrastructure that ensures global access to these films. This can include enhancing online platforms for film distribution, creating subtitles and dubbing in various languages, as well as promoting film education and cultural initiatives aimed at advancing social cinema in different countries.

Conclusion

Socially significant films have enormous potential to influence the world community and can become an important tool for global social change. However, in order for them to effectively impact mass consciousness and stimulate positive change, it is necessary to address a number of issues related to commercialization, censorship, and accessibility. It is important to support international cooperation, defend creative freedom, and ensure wide access to social cinema on a global scale. Only by doing so can socially significant films continue to serve as a source of inspiration and a catalyst for change for the entire world.

Energy in Theatrical Practice: Metaphysical Aspects, Anticipatory Thinking, and Techniques for Managing Stage Presence

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Energy in Theatrical Practice: Metaphysical Aspects, Anticipatory Thinking, and Techniques for Managing Stage Presence.

Energy in theatrical work represents a multifaceted phenomenon encompassing physical, emotional, and spiritual dimensions. In the theatrical context, energy can be defined as an inherent force expressed through the movement, voice, facial expressions, and physicality of performers. This energy directly influences the audience's perception of the performance, conveying both the moods and the personalities of the characters.

On a physical level, the energy of an actor is tied to bodily expressiveness, enabling them to remain active and purposeful throughout the performance. Emotional energy serves as a powerful tool for conveying feelings and establishing a psychological connection with the audience. Actors use it to highlight key scenes and reveal the inner world of their characters. The spiritual aspect of energy can be interpreted as an internal force aimed at creating an atmosphere that fosters a sense of depth and significance in the production for the audience. Thus, energy in theater can be viewed as a collective force of the stage, shaping the emotional impact of the theatrical work.

The metaphysical understanding of energy in theater pertains to interpreting the theatrical space and the interaction between performers and audience as a phenomenon beyond material perception. As highlighted in the book *Metaphysics in Theater*, the stage acts as a unique energetic space where energy serves as an invisible link between actors and the audience. The interaction of a performer with the stage and the auditorium can be seen as an exchange of energies, where the actor channels their emotional and physical tension, and the audience responds with their attention and perception.

Energy transcends mere movement or voice—it becomes a means of spiritual transmission of ideas and meanings, amplifying the theater's impact on its audience. In this regard, the stage serves as a concentrated energy space where actors and viewers engage in a unified process of perception and experience. Metaphysical interpretations reveal theater as more than an art form, transforming it into a space of transformation where both actors and audience participate in creating a shared semantic reality.

The concept of anticipatory thinking plays a crucial role in managing energy on stage, allowing actors and directors to foresee and shape the progression of events, taking into account the audience's future reactions and the development of the action. As demonstrated in the book *Anticipatory Thinking*, the ability to anticipate and understand the stage's energy dynamics helps actors adapt to changes during the performance and regulate their internal state without losing control over the overall atmosphere of the production.

Anticipatory thinking enables actors to maintain energy balance and allocate resources so that scenes remain rich and emotionally potent throughout the performance. Using this technique, actors can not only plan their actions but also predict audience reactions, fine-tuning their energy flow for maximum impact. Thus, anticipatory thinking becomes a tool for intentional energy management, ensuring high levels of stage expressiveness and depth of audience engagement.

Energy and Stage Presence.

The energy of an actor's presence on stage is a fundamental element determining the level of impact on the audience and the perception of the stage persona. Physical and emotional energy shape the expressiveness and strength of the character, revealing their traits and inner world. Actors use energetic preparation to create a compelling stage presence: developing physical energy allows them to move confidently and purposefully, control posture, breathing, and voice, and become the focal point of attention, maintaining the audience's interest.

Emotional energy provides depth and authenticity to the character. Actors captivate audiences not only by delivering text and plot but also by enabling them to feel and experience the emotions of the characters. Proper energetic preparation forms a solid foundation for performance, helping actors engage the audience and make their presence intense and memorable.

The rehearsal process involves essential elements of managing energy states, helping actors build cohesive and controlled stage personas. During rehearsals, actors employ techniques such as concentration, visualization, and self-regulation to enter specific energetic states aligned with the spirit and atmosphere of the production. This may include tuning into calm, dynamic, or even aggressive forms of expression required for various scenes and acting challenges.

Directors and actors use methods to refine physical and emotional interaction during rehearsals, stabilizing and consciously managing their energy. These techniques allow performers to predict their energy states on stage in advance, reducing the risk of burnout or overexertion during the performance. As such, rehearsals become not just a stage for role development but a phase of deep analysis and preparation of the necessary energy levels for the production.

Energy Management During Performances.

During performances, actors face the challenge of sustaining and controlling their energy over an extended period, adapting to changes in scene dynamics and audience reactions. Maintaining energetic intensity requires deliberate control over one's state, including self-tuning methods, physical preparation, and psycho-emotional resets. Techniques such as concentration exercises, breathing practices, and brief breaks help actors restore energy during pauses between scenes.

Energy renewal becomes critical during intense or emotionally charged scenes, where actors must sustain high tempo and emotional expressiveness. Interaction with fellow performers on stage also plays a significant role in maintaining energy levels. Collaborative work, reactions, and energy exchange strengthen stage presence and create a more powerful impact on the audience. Consequently, managing energy during a performance becomes a flexible process involving both individual techniques and teamwork to maintain a continuous flow of stage action.

Energy as a factor of interaction between actors and audience represents a complex process of exchanging energetic impulses within the theatrical space, profoundly influencing the perception of the performance. The stage, filled with the actor's energy, serves as a magnet, drawing the audience's attention and establishing an invisible yet tangible connection. This energy exchange is reciprocal: the audience intuitively responds to the stage action, creating a feedback loop that enriches the performance and enhances its depth.

By synchronizing energy flows with audience reactions, actors achieve a state where their performance takes on new dimensions, intensifying the emotional and psychological impact of the production.

Researching the role of energy in theatrical practice reveals its foundational role in successful interactions between actors, the stage, and the audience. Energy in theater encompasses physical, emotional, and metaphysical aspects, each uniquely influencing the perception and quality of the performance. Combining metaphysical and practical approaches to energy enables actors and directors to deepen their understanding and regulation of a production's impact, ensuring audience engagement and creating an atmosphere where the stage action thrives.

Further research into energy in theatrical practice could enrich both the craft of acting and academic explorations of performance art. Promising areas include studying specific energy techniques for various theatrical genres and styles and examining the audience's responses to performers' energy through psychophysiological methods.

Used in modern decorative-art fields ornament and patterns

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XÜLASƏ

Azərbaycanda dekorativ-tətbiqi sənət qədim tarixə malikdir. Yurdumuzun zəngin təbiəti və gözəllikləri müxtəlif sənət növlərinin inkişafı üçün əlverişli şərait yaratmışdır. Ulu babalarımız hələ keçmiş zamanlarda təbiətdə mövcud olan ən adi şeylərdən: qamışdan, ağacdan, daşdan, gildən, heyvan sümüyü, dərisi və yunundan məişət ehtiyacları üçün əhəmiyyətli əşyalar düzəltmiş, onlardan istifadə etmişlər. Həmin əşyaların üzərində müxtəlif əsrlərə aid rəsmlərə və ornament ünsürlərinə rast gəlinir. Əgər bu əşyaların materialı, forması - bir sözlə, icrası bizə müxtəlif dövrlərdə istehsal prosesinin təşkilindən, təkmilləşməsindən xəbər verirsə, onların üzərindəki rəsm və naxışlar əcdadlarımızın həyat tərzini, adət - ənənələrini, dini ayinlərini və bədii zövqünü əks etdirən nadir incilərdir. Tarixi inkişaf prosesində tədricən Azərbaycanda dekorativ-tətbiqi sənətinin dulusçuluq, ağac və şüşə məmulatları istehsalı, daş, ağac və kəç üzərində oyma, bədii metal işləmə, bədii parça və tikmələr, toxuculuq, xalçaçılıq, zərgərlik və digər sahələri inkişaf etməyə başlamışdır.

Açar sözlər: dekorativ – tətbiqi sənət, xalçaçılıqda ornament, naxış, məzmun, forma

Abstract

Decorative and Applied Art in Azerbaijan has an ancient history. The rich nature and beauty of our land created favorable conditions for the development of various types of art. Our great-grandfathers made and used important items for household needs from the most ordinary things that existed in nature even in past times: reeds, wood, stone, clay, animal bone, skin and wool. Paintings and elements of ornaments of different centuries are found on these objects. If the material, shape - in a word, the execution of these items tells us about the organization and improvement of the production process at different times, then the drawings and patterns on them are rare pearls that reflect the way of life, traditions, religious rituals and artistic taste of our ancestors. In the process of historical development, pottery, wood and glass products, stone, wood and paper carving, artistic metalworking, artistic fabrics and embroidery, weaving, carpet weaving, jewelry and other fields of decorative and Applied Art gradually began to develop in Azerbaijan.

Keywords: decorative and Applied Art, ornament in carpet weaving, pattern, content, form

Dekorativ-tətbiqi sənət çox geniş və çoxsahəli məfhumdur. Bu sənət gündəlik həyatımızın tələbatından yarandığı üçün ilk əvvəl utilitarlıq birinci yerdə durur, insanlar öz həyatında gündəlik əşyalardan istifadə edirlər. Bu əşyaların estetik tərəfi sonradan yaranır və bunlar bir-birini tamamlayırlar. Demək olar ki, dekor ayrıca olaraq əmələ gəlmir, insanların həyatı üçün vacib olan əşyaların üzərinə əlavə edilir. Ona görə də dekorativ-tətbiqi sənət deyəndə mütləq əsas iki istiqaməti nəzərdə tutmaq lazımdır:

1. Lazımi funksional əşya
2. Onun üzərini bəzəyən gözəl dekor

Dünya incəsənətinin qədim dövrünə nəzər salsaq, bizə aydın olur ki, insan həyatına lazım olan əşyalar ilk zamanlar sadə və bəzəksiz olmuşdur. Sonradan isə həmin sadə əşyaların üzərinə

həndəsi, heraldik və simvolik məna daşıyan elementlər əlavə edilmişdir. Və təbii ki ilk naxışlar primitiv- həndəsi olmuşdur. Dekorativ-tətbiqi sənət məmulatlarının üzərindəki naxış adlarının bir qismi onların tarixən qədim dövrlərdən işlədilməsi nəzərə alınaraq klassik naxışlar qrupu kimi fərqləndirilir. Çıxmaq, pilək, pitik, oxbaşı, dəvədabam, cücüzü, saçığı, sallama, puta-buta, sırğa və sair bu qəbildəndir. Bir sıra naxışların müxtəlif növləri vardır. Məsələn, qədim naxış növlərindən biri olan butanın badambuta, əyributa, qotazlıbuta, çiçəkli buta, qədim buta, qarmaqlı buta və balalı buta kimi müxtəlif növləri vardır. Kompozisiya xüsusiyyətlərinə görə dekorativ-tətbiqi sənətdə istifadə olunan naxışları onlarda təsvir edilən fiqur və elementlərə, omamentlərə görə ayrı-ayrı qruplara ayırmaq olar.

L.Kərimov xalçaçılıqda istifadə olunan naxışlan ornamentlərin məzmun və formasına görə 4 əsas qrupa ayırmışdır:

- 1) canlıların təsviri;
- 2) məişət əşyalarının təsviri;
- 3) müxtəlif formalı elementlər;
- 4) bitki elementləri.

Zənnimizcə, dekorativ-tətbiqi sənətdə işlədilən naxışların adlarını bildiren leksik vahidləri aşağıdakı tematik qruplarda birləşdirmək daha məqsədəuyğundur;

- 1) insan və insanla bağlı təsvirlərin adları (uşaq, adam, baş, əl, qabırğa, kişi, bığ, göz və s.);
- 2) heyvani naxışlar (maral, qurbağa, pişik, keçi, inək, pəncə, kəklik, qırqovul, xoruz, ördək, bülbül, hörümçək, toyuq, dəvə, tazi, dəvə ləpiri, it, tazi, tovuz, qaz, pərvanə, gecəquşu və s.);
- 3) nəbati naxışlar (zanbaq, gül, yarpaq, alma, xarı bülbül, fındıq, nar, qoz, lobyə, cincilim, sarıgül, əvəlik, çölötu, boranı, şabalıd, palıd, yonca, istiot, çinar, lobyə yarpağı və s.);
- 4) məişət əşyaları (çəngəl, cəftə, pəncərə, aftafa, şamdan, ərsin, qıf, qətdan, çarx, başlıq, daraq, möhür, yağdan, küpə, toqa, düymə, yelpik, güzgü, mismar, təndir, xəlbir, beşik, qıynaq, kotan, nəlbəki və s.);
- 5) təbiət obyektləri və predmetləri.



Orta əsrlərdə dünyanın bir çox ölkələrində incəsənətin yüksəlişi diqqəti cəlb edir. Avropada bu yüksəliş “İntibah dövrü” adı ilə məşhurdur. Məlum olduğu kimi, İntibah dövrü o zaman incəsənətdə “yeniliyin yaranması” demək idi. Əvvəllər İtaliyada, sonralar isə Avropanın digər

ölkələrində yaranıb formalaşan və çiçəklənən feodalizmə müxalif olan bir mədəniyyət yaranır. Bu dövr Fransada, İtaliyada incəsənətin təqlid dövrü olub, Antik Roma dekoruna marağı daha da gücləndirmişdir. Dekor sənətində nəbatı motivlər - ağac zoğları, budaqlar; dekorativ sənətdə isə güldənlərdən aşılıb-daşan tər güllər daha çox dəbə düşür. Yaxın və Orta Şərq ölkələri özlərinin İntibah dövrünü ilk orta əsrlərdən keçirsələr də (IX-XII əsrlər), naxış sənətində üslubun dəyişilməsi XI-XIII əsrlərdən başlasa da, nəbatı naxışların tam formalaşması XVI-XVII əsrlərə təsadüf edir. Azərbaycanda bu ilk növbədə əl yazılı kitab qrafikasının və miniatür sənətinin inkişafı ilə əlaqədar olmuşdur.

Plastik və mənzərəli bitki aləminə gəldikdə, bu ornament incəsənətin bütün növlərində istifadə edilirdi. Dünya xalqlarının bədii yaradıcılığında həmişə geniş yayılan bitki ornamentləri müsəlman incəsənətində artıq xüsusi, aparıcı yeri tutur. Bitki ornamentləri İslam mədəniyyətində özünün dəqiq, qaydalı formaları və kompozisiyaları ilə seçilirdi. Ən əsası da bitki ornamentinin burada xüsusi üslubu var idi. Bu üslubda ideal gözəllik, incə, nəfis şəkildə öz əksini tapırdı.

Azərbaycanda ornament növlərinin təsnifatının problemləri təəssüflər olsun ki, bu günə qədər kifayət dərəcədə öyrənilməyib. Bütün deyilənləri bununla nəticələndirmək istəyirik ki, üzərində tədqiqat apardığımız Azərbaycan dekorativ - tətbiqi sənətinin özünəməxsus naxış tərtibatının olması və bu motivlərin təsnifatının öyrənilməsi ornamentlərin daha da açıqlanmasına kömək edəcəkdir.





*Keramik boşqab üzərində dekorativ – tətbiqi sənət nümunəsi
"Xarı bülbül" . (Ölçü 25 sm)*



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SULTAN MAHAMMAD CREATIVITY

Seyfullayeva Aynur Tahir gızı

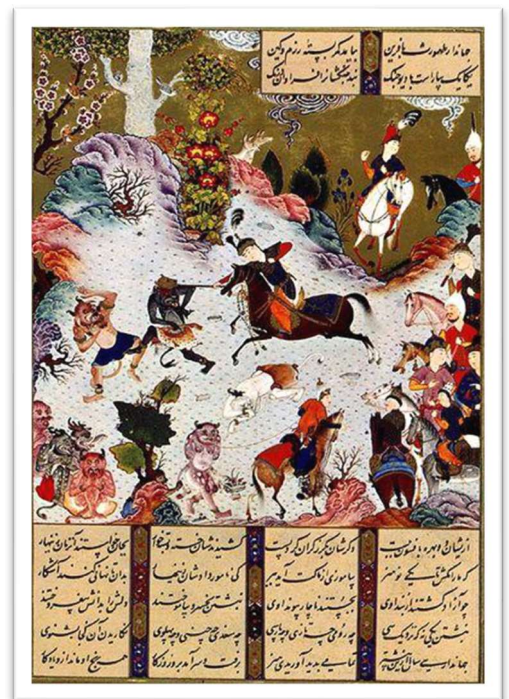
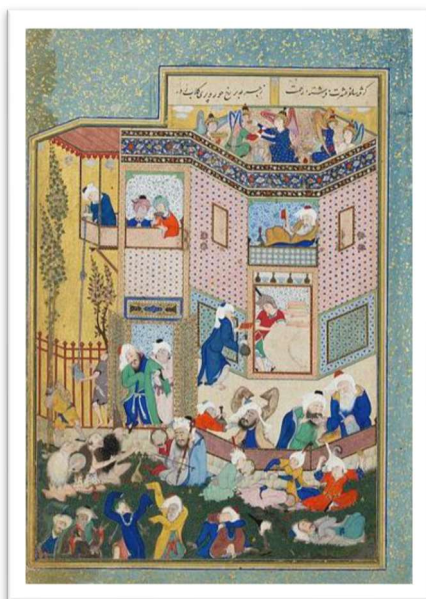
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Abstract:

Like other artists, information about Sultan Muhammad's life and work is very limited. However, the notes of 3-4 medieval authors, the works of the great artist that have reached our time allow us to shed light on the work of this great artist. The short but very coherent notes of the medieval authors about the artist have a great disadvantage. In the 16th century, the author's creativity, artist appreciation and art historian Dust gave high praise to the artist's creativity. Budaq Qazvini and Gazi Ahmad Sultan Muhammad noted that "the characteristics of the golden heads are best described." The famous historian Iskander Munshi considered Sultan Muhammad on the same level as the great artist of the East, Kamaladdin Behzad. The flourishing period of Sultan Muhammad's creativity affects the 20s-40s of the 16th century. Of these budgets, he served as the director and general director of the palace workshop, producing illustrations for rare manuscripts, portraits, sketches for carpets and fabrics, etc. created.

Key words: Miriature, Hand writing, Pictures.

Rəssamın hələlik bəlli olan ən görkəmli əsərləri 1537-ci il tarixli "Şahnamə", "Hafizin Divanı" (şəkil 102) və 1539-1543-cü illərdə Şah Təhmasib üçün hazırlanmış Nizami "Xəmsə"sinin məşhur əlyazma nüsxəsində toplanmışdır. Bundan başqa Sankt-Peterburqun Saltıkov-Şedrin adına kitabxanada, İstanbul, London, Paris, Vaşinqton, Krakov və başqa böyük şəhərlərin muzey və kitabxanalarında rəssamın bir sıra portret əsərləri, süjetli miniatürləri və kitab rəsmləri saxlanır. Nizaminin 1524-1525-ci il tarixli "Xəmsə" əlyazmasına (Nyu-York, Metropoliten muzeyi) çəkilmiş "İsgəndər Xaqanın qəbulunda" və Nəvainin 1527-ci il tarixli əlyazmasına (Paris, Milli Kitabxana) çəkilmiş "Bahram Gur ovda" adlı miniatürlər



adlı miniatürlər

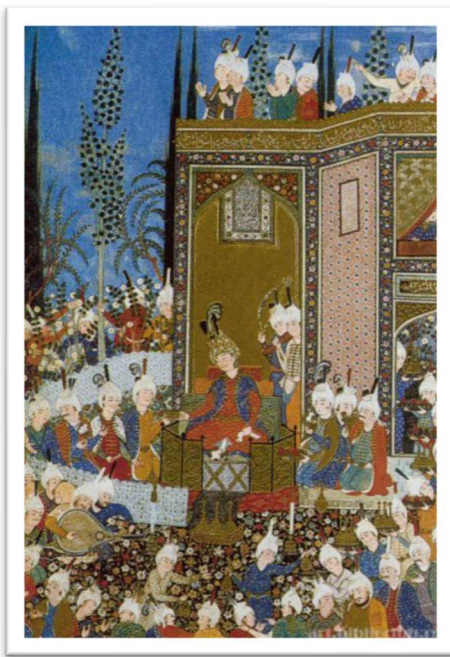
rəssamın ilk əsərlərindən hesab edilir. Lakin obrazların həlli, kompozisiyanın mürəkkəbliyi, insan və heyvan fiqurlarının canlı, ifadəli və dinamik təsviri bu əsərlərin yaradıcılığı artıq püxtələşmiş, istedadlı bir sənətkar tərəfindən çəkildiyini sübut edir.

Sultan Məhəmmədin təxminən 1535-ci ildə "Hafizin Divanı" əlyazmasına çəkdiyi miniatürlərdən birində Sam Mirzənin sarayında kef və musiqi məclisi təsvir olunub. Burda rəssam şair kimi real həyatın gözəlliklərini, insanın hiss və

ehtiraslarını tərənnüm edir, onları hər cür dünyəvi hissləri qadağan edən dini ehkamlara qarşı qoyur. Hafizin lirikasının ruhunu, əsil ideya məzmununu düzgün əks etdirmək üçün rəssam çox orijinal kompozisiya yaratmışdır. Həyatdakı real əyləncə məclisinin dam üstündə təzə aya baxaraq salavat çevirən zahidləri təsvir edən ikinci səhnəciklə qarşılaşdırır. Real həyat, dünyəvilik ilk plana çəkilir, dini mistikaya qalib gəlir.

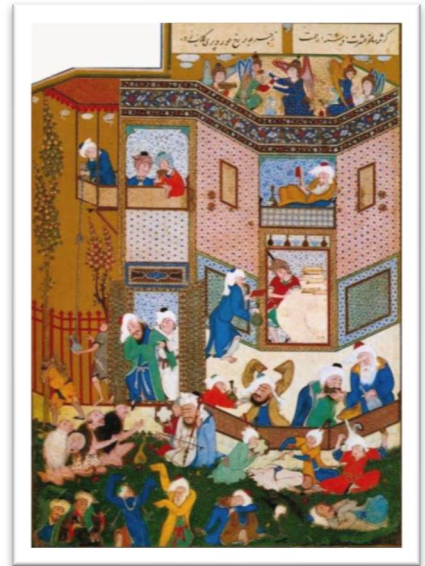
“Şahnamə”nin bədii-estetik baxımdan dəyərli, yüksək sənət əsərləri sayılan yüzrlərlə nəfis nüsxələri vardır. Lakin bunlardan 3 – “Demot “Şahnaməsi” (XIV əsr Təbriz məktəbi), “Baysunkar Şahnaməsi” (XV əsr Herat məktəbi) və “Şah Təhmasib Şahnaməsi” (XVI əsr Təbriz məktəbi) incəsənət tarixində xüsusi şöhrət qazanmışdır.

Sultan Məhəmmədin yaradıcılığı və ümumiyyətlə Təbriz məktəbinin yüksəliş dövrü XVI əsrin 20-30-cu illərinə təsadüf edir. Bu dövrdə Təbrizdə saray kitabxanasında yaranmış miniatürlü əlyazmalar içərisində Şah Təhmasib üçün hazırlanmış “Şahnamə”dir. Hazırlanması hələ Şah İsmayıl dövründə başlanmış bu əlyazmanın bədii tərtibatı, süjeti, üslubu və sənətkarlıq xüsusiyyətlərinə görə müxtəlif olan 258 miniatür ilə bəzədilib. 258 miniatürdən yalnız ikisinin üzərində dövrün görkəmli rəssamlarından olan *Mir Müsəvvir*in və *Dust Məhəmməd*in imzası var. Lakin aydındır ki, şah üçün hazırlanan belə monumental əsərin bədii tərtibatında saray emalatxanasının bütün sənətkarları, birinci növbədə ustad rəssamlar iştirak etməyə bilməzdi. Miniatürlərdən yeddisi Sultan Məhəmməd yaradıcılığına aid edilmişdir. Bunlar “*Keymurazın sarayı*”, “*Huşəngin məclisi*”, “*Zöhhakın Firudinə sūd verən inəyi – Birmayehi öldürməsi*” və “*Zöhhakın edam edilməsi*” adlı miniatürlər kompozisiya qurumu, insan, heyvan və mənzərə ünsürlərinin çəkilişi, yerləşdirilməsi, onların və ümumiyyətlə kompozisiyanın rəng həlli və s. üslub xüsusiyyətlərinə görə Sultan Məhəmmədin dəst-xəttinə çox oxşayır və imzasız olmalarına baxmayaraq onun tərəfindən çəkildiyinə şübhə doğurmuyur.



I miniatürdə İranın ilk əfsanəvi şahı *Keymurazın saray məclisi* təsvir edilib. Əsərdə əcaib formalı dağlıq mənzərə fonunda, sanki alov dilimlərindən düzəldilmiş qaya taxta əyləşmiş Keymuraz, ondan bir qədər aralı, yenə də qayalıqdan ibarət kiçik taxta oğlu Siyamak, onunla üzbəüz ayaq üstə dayanmış mələk Siruş, kompozisiyanın aşağı hissəsində isə çevrə boyu əyləşən və ayaq üstə dayanan gənc və qocalar, kişilər və qadınlar, yırtıcı və çöl heyvanları əks olunub. Oğlu Siyamakın qara divlə vuruşda həlak olacağını əvvəlcədən bilən Keymurazın obrazı, xüsusən onun kədərli, həsrətli baxışı, hər şeydən xəbərsiz olan Siyamakın isə qorxmazlığı ifadəli verilmişdir.

Miniatürün bədii təsir qüvvəsinin əsasını al-əlvan, əsrarəngiz gözəlliyə malik olan təbiət təsviri təşkil edir. Müxtəlif formalı daş və qayaların düzümündən yaranan sıldırımlı dağlıq mənzərənin, dağın zirvəsi və yamaclarda bitən yaşıl və çiçək açmış əcaib ağaclar, kollar, gül və çiçəklərin təsvirində, xüsusən onların rəng həllində ustad rəssamın sehirli sənətkarlığı, incə qələmi yüksək bədii zövqü hiss olunur. Əsər təbiətdə mövcud olan rənglərin kontrastlığı və ritmik təkrarından doğan zəngin kolorit əsasında qurulmuşdu.

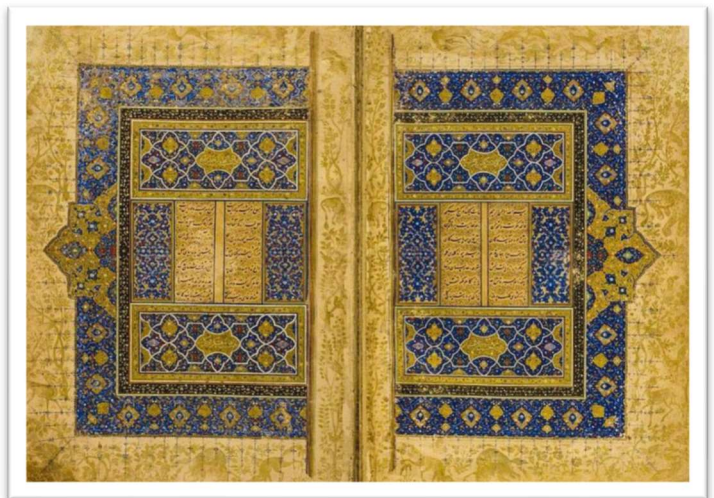


Mənzərənin təsviri yalnız bədii cəhətdən maraq doğurmur. Onun həllində xalq nağıllarından, folklordan gələn əfsanəvilik təsiri özünü hiss etdirir. Bəzi daşların, qayaların formasında insan və heyvan sifətinə bənzədilməsi təbiətin canlı orqanizm, ruhlarla dolu olması ideyasını əks etdirir. Digər tərəfdən kompozisiyanın yuxarı hissəsində qayalar və ağaclar arasında təsvir olunan insan fiqurları təbiətə qaynayıb-qarışmış, onun ayrılmaz hissəsinə çevrilmişdir. Təbiətin canlılaştırılması mənzərəyə süjetin məzmunu ilə bağlı olan bir əfsanəvilik, sehrilik verir.

Bir sıra əsərlərində olduğu kimi, burada da rəssam təbiət təsvirini xəttatın miniatür üçün ayırdığı səthin həddləri ilə məhdudlaşdırmır. O, mənzərənin hissə və bölümlərini miniatürlərin çərçivəsindən cəsarətlə kənara çıxarır və bununla da məkanın genişliyi, təbiətin həddusuzluğu təəssüratını oyadır.

II əsərdə Hüşəngin axşam yığıncağı əks etdirilir. Keymurazın nəvəsi Hüşəng atasının intiqamını alandan sonra hər gün saray adamlarını tonqalın ətrafına toplayıb onlara özünün kəşf etdiyi odun əhəmiyyətindən söhbət edərdi. Miniatürdə Hüşəng haqqında olan maraqlı hekayətin məhz bu epizodu təsvir edilir.

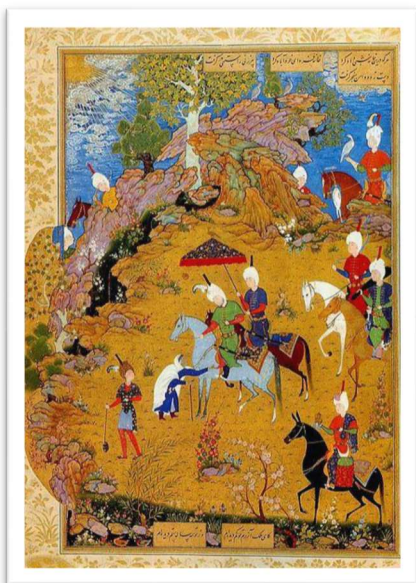
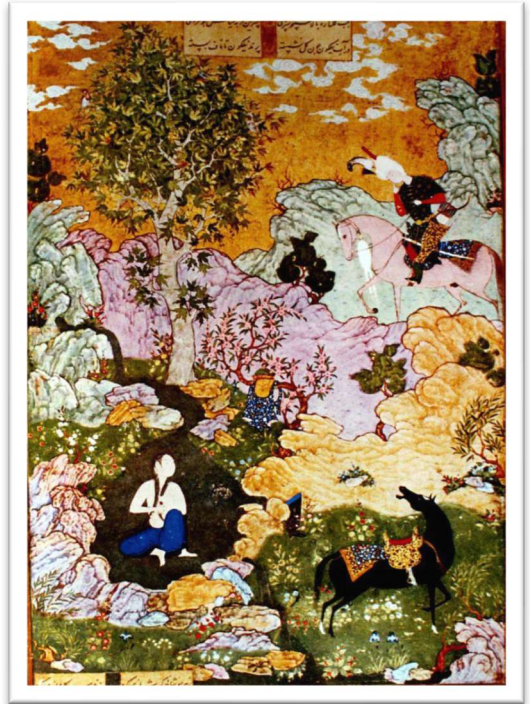
1539-1543-cü illər Təbriz “Xəmsə”si. Sultan Məhəmmədin yaradıcılığı üçün daha səciyyəvi olan və XVI əsr Təbriz məktəbinin bütün nailiyyətlərini, yüksək üslub xüsusiyyətlərini özündə cəmləşdirən ən kamil və daha məşhur əsərləri Nizaminin 1539-1543-cü il tarixli “Xəmsə” əlyazmasına çəkdiyi illüstrasiyalardır. Londonun Britaniya muzeyində saxlanılan bu məşhur nüsxə incə nəstəliq xətti, səhifələrin zəngin bədii tərtibatı və miniatürlərinin misilsiz bədii keyfiyyətinə görə haqlı olaraq yalnız Azərbaycanda deyil, ümumiyyətlə Yaxın və Orta Şərqdə kitab sənətinin ən zərif, ən qiymətli şah əsərlərindən hesab edilir. XVI əsrin ən görkəmli xəttatlarından sayılan *Şah Mahmud Nişapurinin* yazdığı bu nəfis nüsxə Sultan Məhəmməd, onun tələbələri *Mirzə Əli*, *Müzəffər Əli*, *Mir Seyid Əli* və müasirlərindən *Ağa Mirək* və *Mir Müsəvvir* kimi dövrün ən mahir ustad rəssamları tərəfindən illüstrə edilmişdir. Kitabda Sultan Məhəmmədin 4 miniatürü vardır.



“*Xosrov və Şirin*” poemasına çəkilmiş bir miniatürdə Şirin çimərkən Xosrovun ona seyr etməsi təsvir olunur. Yaxın və Orta Şərqin bütün sənət məktəblərində, müxtəlif sənət sahələrində ən çox fırçaya alınmış bu süjetin ən qədim təsvirləri XII əsrə aid çini qabda rast gəlirik. Şərq rəssamlarının ən çox sevdikləri bu lirik səhnə XIV-XVII əsrlərdə, yəni Sultan Məhəmməddən əvvəl və sonra da dəfələrlə Təbriz, Şiraz, Herat, Buxara və başqa məktəblərin nümayəndələri tərəfindən fırçaya alınmışdır, lakin öz dolğun və yüksək bədii ifasını Sultan Məhəmmədin çəkdiyi miniatürdə tapmışdır. Süjetin məzmununa uyğun olaraq, miniatür lirik səpgidə həll edilmişdir. Yaraşlıqlı çinar, rəngarəng gül və

çiçəklərlə bəzənmiş yaşıl çəmənlik böyük diqqət doğurur. Kompozisiya qurumu və onun rəng cəhətdən məharətlə həll edilməsi bu diqqəti daha da qüvvətləndirir. Əsas qəhrəmanların və yardımçı detalların təsviri kompozisiyada diaqonal boyu yerləşdirilmişdir. Onların şux və əlvan, kontrast rənglərinin ritmik təkrarından əmələ gələn çox zərif və zəngin kolorit miniatürə şux dekorativlik və gözəllik verir.

Sultan Məhəmməd əsərlərinin bədii-estetik təsir qüvvəsinin əsasını təşkil edən, onlara gözəllik verən zəngin kolorit və dekorativlik Azərbaycan miniatürləri üçün səciyyəvi üslub xüsusiyyətlərindən olub, onları başqa məktəblərin əsərlərindən fərqləndirir. Surətlərin həllinə gəldikdə, ümumiyyətlə miniatür sənətinə xas olan məhdudluq burada da özünü göstərir. Rəssam Xosrov və Şirinin keçirdiyi mürəkkəb hiss və həyəcanı, daxili sarsıntıyı, qəhrəmanların psixoloji xarakterini açmaqla, yəni onların üzündəki ifadələri göstərmək yolu ilə deyil, zahiri əlamətləri vasitəsilə əks etdirir. Atın narahat kişnəməsindən kiminsə yaxınlaşmasını duyan Şirin uzun qara saçları ilə öz çılpaq bədənini örtməyə çalışır. Şirinin gözəlliyinə valeh olan Xosrovun heyrat və həyəcanını göstərmək üçün rəssam onu barmağını dişlərkən təsvir edir.



“Yeddi gözəl” poemasına çəkilmiş miniatürdə Bəhrəmin bir oxla şir və guru öldürməsi süjeti təsvir edilir. Kompozisiyanın tamlığı və lakonikliyi, rənglərin azlığı, dağlıq mənzərə və onun fonunda, tam mərkəzdə at belində verilən Bəhrəmin dinamik təsviri əsərə əzəmət, monumentallıq verir.

“Sirlər xəzinəsi”nə çəkilmiş bir miniatürdə Sultan Səncər və qarı əhvalatı təsvir olunur. İnsanlıq hüquqları tapdalanmış qarı şahın ətəyindən yapışaraq, kəskin ifadələri onun üzünə çırpır.

1539-43-cü il tarixli Nizami “Xəmsə”sinə çəkilmiş “Məhəmmədin meraci” adlı miniatür Şərq rəssamlarının yaradıcılığında çox az təsadüf edilən dini məzmunlu süjeti təsvir edir. Əsər spiralvari kompozisiyanın mürəkkəbliyi və dinamikliyi, fiqurların sürətli hərəkəti, gərgin vəziyyəti və kəskin rakurslarda verilməsi, nəhayət kontrast rənglərin uyğunluğu, vəhdəti əsasında əldə edilən zəngin koloriti, füsunkar gözəlliyi ilə bu

mövzunu əks etdirən bütün əsərlərdən fərqlənir, Azərbaycan miniatür sənətinin ən dəyərli nümunələrindən hesab edilir.

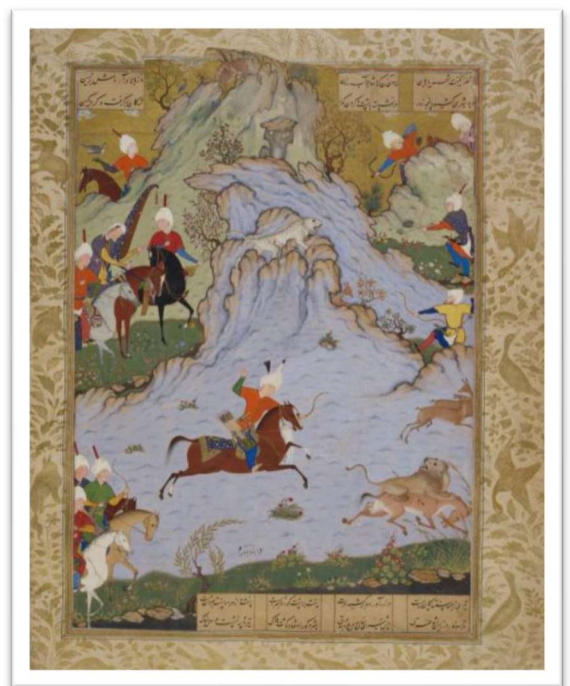
Sultan Məhəmməd məktəbinin davamçıları. Şeirə, sənətə yüksək qiymət verən, himayəçilik göstərən, özləri də şair, rəssam və xəttat olan *İsmayıl* və oğlu *Təhməsin* dövründə Təbriz saray kitabxanası bədii yaradıcılığın müxtəlif sahələrində çalışan sənətkarları öz ətrafında toplayan qüdrətli sənət mərkəzinə çevrilir. Müxtəlif səbəblər üzündən başqa ölkələrə səpələnmiş sənətkarlar yenidən vətənə qayıdır və xalqın çoxəsrlik zəngin bədii ənənələrinə əsaslanaraq yeni nailiyyətlər əldə edirlər. Kitabxananın nəzdindəki bədii emalatxanada dövrün ən görkəmli xəttat və

rəssamları – Sultan Məhəmməd, onun oğulları Mirzə Əli və Məhəmmədi, Mir Müsəvvir və oğlu Mir Seyid Əli, Müzəffər Əli, Sadıq bəy Əfşar, Şah Mahmud Nişapuri, Dust Məhəmməd və bir çox başqa sənətkarlar qızgın fəaliyyət göstərirdilər. Bundan əlavə, emalatxanada Herat, İsfahan, Şiraz və s. şəhərlərdən gəlmiş Şərqi məşhur sənətkarları *Behzad*, *Ağamirak*, *Qasımali* və başqaları çalışırdı. Təbriz miniatür məktəbinin üslub xüsusiyyətlərinin formalaşmasında, bu məktəbin yüksək inkişafında və onun təsir dairəsinin genişlənməsində mühüm rol oynayan bu rəssamlar hərtərəfli inkişaf etmiş görkəmli sənətkarlar idi. Onların çoxu şair – rəssam, rəssam – xəttat, xəttat – memar – rəssam olub, bədii yaradıcılığın müxtəlif sahələrində görkəmli nailiyyətlər əldə etmişlər. Bu baxımdan rəssam – xəttat və sənət tarixçisi Dust Məhəmmədin, rəssam və dekorativ sənətlər ustası Sultan Məhəmmədin fəaliyyəti xüsusilə maraqlıdır. Bu dövrdə ədəbi irsə, klassik ədəbiyyata maraq daha da artdığından, görkəmli şairlərin əsərlərinin əlyazma kitabları şəklində tərtibinə xüsusi fikir verilirdi. Bu isə Azərbaycanda kitab sənətinin – xəttatlıq, miniatür sənəti və bədii tərtibatçılığın daha geniş yayılmasına, yüksək inkişaf zirvəsinə çatmasına səbəb olur.

Saray emalatxanasında toplanan rəssam və xəttatlar Firdovsi, Nizami, Sədi, Hafiz, Nəvai, Dəhləvinin və başqa klasik şairlərin divanlarını gözəl xətlərlə yazıb zəngin ornament kompozisiyaları və əlvan miniatürlərlə bəzəyirdilər. Bundan əlavə onlar məscid və saray binalarını bəzəyən monumental kitabələr üzərində işləyir, süjetli və ornamental xalçaların, bədii parçaların çeşnilərini verir, binaların daxilini bəzəyən monumental divar təsvirləri yaradır, sonralar xüsusi albomlarda portret və süjetli kompozisiyalardan ibarət müstəqil miniatürlər çəkirdilər.

XVI əsr Təbriz məktəbinin inkişafında Herat məktəbi ənənələrinin və Behzad yaradıcılığının müəyyən rolu olduğunu inkar etmək olmaz. Lakin bu bir həqiqətdir ki, onların bu rolu heç də həlledici olmamışdır. Təbriz məktəbinin inkişafını Herat məktəbinin təsiri ilə əlaqələndirərkən, Behzad başda olmaqla Herat rəssamlarının Şah İsmayılın saray kitabxanasında işləmələrinə əsaslanırlar. Belə ki, 1507-ci ildə *Şeybani xan*, sonra isə *Şah İsmayıl* Heratı aldıqdan sonra (1510) müxtəlif ölkələrə dağılan Herat rəssamlarından bir neçəsi Təbrizə gələrək saray emalatxanasında işləmişlər. Lakin bu həqiqəti qeyd etmək lazımdır ki, əgər Buxara və başqa şəhərlərdə çalışan Herat rəssamları öz üslublarını olduğu kimi saxlayıb, Orta Asiyada Behzadın ənənələrini davam etdirirdilərsə, Təbrizə gələnlər isə çox tezliklə yerli ənənələrin təsiri altına düşərək öz ilk əsərlərini Təbriz məktəbi üslubunda yaratmışlar. Bəzi mənbələrdə Behzadın Təbrizə hələ 1507-1510-cu illərdə gəlməsi və hətta Sultan Məhəmmədin müəllimi olması qeyd olunur. Lakin bu məlumatlar həqiqətə uyğun deyil. Yazılı mənbələrə istinad edərək məlum olur ki, yalnız 1522-ci ildə Behzad Şah İsmayılın xüsusi fərmanına görə onun saray kitabxanası və rəssamlıq işlərinin rəisi təyin edilir. Qazı Əhmədin yazdığından aydın olur ki, Sultan Məhəmməd Behzad Təbrizə gəlməmişdən əvvəl aparıcı sənətkar kimi Şah İsmayılın kitabxanasında işləmiş və kiçik Təhməsbəy rəssamlıq təlimi vermişdi.

Təbriz məktəbinin inkişafını, bu dövrdə yaranmış yeni üslubun formalaşmasını heç şübhəsiz ki, Behzadın deyil, bilavasitə Sultan Məhəmmədin və onun rəhbərliyi altında işləyən Mirzə Əli, Müzəffər Əli, Mir Seyid Əli və başqa Azərbaycan rəssamlarının yaradıcılığı ilə əlaqələndirmək lazımdır. Təsədüfi deyil ki, XVI əsrdə Təbrizdə yaradılmış, lakin müəllifləri bəlli olmayan miniatürlər



bədii üslub xüsusiyyətlərinə görə adətən “Sultan Məhəmməd”, “Təbriz”, yaxud da “Səfəvi” məktəbinə aid edilirdi.

Kitab illüstrasiyalarından əlavə Sultan Məhəmmədin bir sıra portretləri və real həyat hadisələri əks etdirən məişət janrlı miniatürləri vardır. Bu əsərlərin əksəriyyətində rəssamın öz dövrü üçün səciyyəvi olan saray həyatı, şah başda olmaqla saray əyanlarının əyləncələri təsvir olunur.

Sultan Məhəmmədin müəllifi olduğu Sankt-Peterburqda Saltikov-Şedrin adına kitabxanada saxlanan 4 miniatürdə Təhmasib və saray əyanlarının ov məclisi təsvir edilir. Bu əsərlər gözəl dekorativ xüsusiyyətlərindən başqa, kompozisiyanın çoxfıqurlu və mürəkkəbliyi, ayrı-ayrı səhnəciklərin, surətlərin, mənzərənin, heyvan fıqurları və detalların olduqca real və ifadəli həll olunması ilə diqqəti cəlb edir. Bu əsərlər rəssamın dərin müşahidəçilik, böyük sənətkarlıq qabiliyyətinə malik olduğunu bir daha sübut edir. Bu baxımdan Ə.Caminin həmin kitabxanada saxlanan “*Silsilat-əzəzəhəb*” əsərinin qoşa səhifəsini bəzəyən “*Şahın şikarı*” diptixi xüsusilə qeyd edilməlidir. Məzmunu və bədii formasına görə biri-birinin məntiqi davamı olan, bir-birini tamamlayan, kompozisiya qurumu, koloriti və vahid süjet xəttinə görə birləşərək çoxplanlı, olduqca mürəkkəb, çoxfıqurlu və miniatür boyakarlığı üçün nadir hal olan böyük ölçülü tam bir kompozisiya əmələ gətirən bu əsərdə saray əyləncələrindən olan, minlərlə adamın iştirak etdiyi şah şikarının dəbdəbəli, təntənəli cəhətləri bütün təfərrüatı ilə öz əksini tapmışdır.

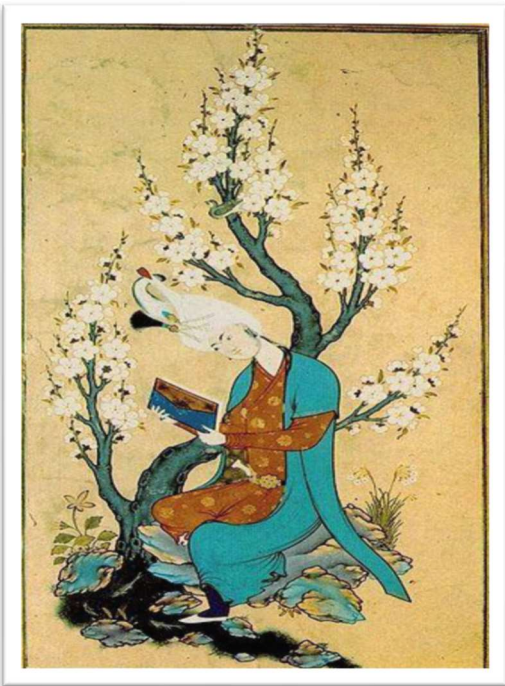


Qəhvəyi, yaşıl, çəhrayı və digər rənglərin müxtəlif çalarlarının ahəngdar düzümündən yaranmış sıldırımlı və yastı qayalar diaqonal boyu səhifələri birləşdirən qapalı bir məkan yaradır. Əlvan çiçəklərlə dolu çəmənlikdən ibarət ovlağı əhatələyən atlı və piyada ovçular dağların zirvəsi və yamaclarından, qayalıqların aralarından pələng, gur, maral, ceyran və s. heyvanları qovaraq ovlağa doldururlar. Bu fikri ifadə etmək üçün rəssam bir-birini tamamlayan olduqca müxtəlif maraqlı səhnəciklər, epizodlar göstərir. Bu səhnəciklər və onların ifadəsi olan epizodik obrazlar son dərəcə müxtəlif hal və hərəkətdə, olduqca canlı, təbii və ifadəli təsvir olunur. Bu fıqurlar öz hərəkətləri, paltarlarının əlvan, kontrast rəngləri ilə kompozisiyaya ümumi bir canlanma, rəngarənglik gətirir. Bu hərəkət və rənglərin ritmik təkrarı isə əsərə dinamiklik verir, onun emosional təsir qüvvəsini artırır.

Maraqlısı burasıdır ki, diptixdə bir hadisə, vahid süjet təsvir olunmasına baxmayaraq əsərin baş qəhrəmanı – gənc şahın surəti 2 yerdə təkrarlanır. Kompozisiyanın sağında o, gün altında, xalçanın üstündə oturmuş, solunda isə maral və ceyranları təqib edən vəziyyətdə verilib. Qorxudan hürküb müxtəlif istiqamətlərdə qaçan, yaralanıb yıxılan heyvanların hərəkəti mürəkkəb, bəzən də çətin, gözlənilməz rakurslarda verilmiş vəziyyətləri son dərəcə təbii, real və ifadəli, böyük ustalıqla əks etdirilir.

Qeyd etmək lazımdır ki, Sultan Məhəmmədin çəkdiyi illüstrasiyalar XVI əsrdən başlayaraq bütün sənət məktəblərində tez-tez fırçaya alınmış süjetləri əks etdirir. Lakin rəssamın böyük ustalıqlı elə ondadır ki, ənənəvi mövzuları təsvir edərkən o, ənənəvi yollarla getməmiş, onları yeni süjet xətləri ilə zənginləşdirmiş, yeni obrazlı ifadə vasitələri tapmışdır. Orijinal kompozisiya quruluşu, kontrast

ritmik təkrarlanan kolorit, şux dekorativlik, ifadəli obrazlar, realistik və əfsanəvi ünsürlü mənzərə Sultan Məhəmmədin əsərlərinə başqa məna, forma gözəlliyi verir, onların emosional gücünü daha da qüvvətləndirir, onları eyni və oxşar mövzulu miniatürlərdən fərqləndirir.



Sultan Məhəmməd yaradıcılığında portret janrı.

S.Məhəmmədin yaradıcılığında portret janrı da əhəmiyyətli yer tutur. Onun portret əsərlərində sarayın estetik tələbi, gözəllik idealına uyğun olaraq müəyyən kanonlar əsasında idealizə edilmiş gənc və gözəl şah surəti təsvir olunur. Zəhəri oxşarlığı, etnoqrafik xüsusiyyətləri, fərdi keyfiyyətləri ilə fərqlənməyən, yalnız müxtəlif hal və hərəkətlərdə verilmiş portret təsvirlərində əsas məqsəd şahın gözəlliyini tərənnüm etməkdir.

“Şah Təhmasib” ikonoqrafik portretinin təhlili.

Sultan Məhəmmədin əsərlərindən birində mütəkkəyə söykənərək kitab oxuyan gənc bir oğlan təsvir edilir. Müəyyən ikonoqrafik əlamətlərinə görə bu əsər ədəbiyyatda şah Təhmasibin portreti kimi qəbul edilmişdir.

Sultan Məhəmmədin Sankt-Peterburqda Saltıkov-Şedrin adına kütləvi kitabxanada və İstanbulda Topqapı sarayı muzeyində saxlanan portretləri bədii üslub

xüsusiyyətlərinə görə miniatür sənətində portret janrının ən mükəmməl, maraqlı əsərlərindən hesab edilə bilər. Bu portretlərdə gənc və yaraşlıq, zəngin libaslı, lələklə bəzənmiş qızılbaş çalması bir oğlan surəti təsvir olunub. Tipajı, geyimi və s. zəhəri əlamətlərinə görə bir-birindən fərqlənməyən, yalnız müxtəlif vəziyyətdə bir yerdə daş-qaşla bəzənmiş kürsüdə, II-də çiçəklənmiş badam ağacının yanında (Sankt-Peterburq), III-də xalça və döşəkçədə dizi üstündə oturmuş şah hər yerdə kitab oxuyarkən təsvir olunur.

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НИЛЬС БОР ПОСТУЛАТТАРЫНЫҢ ТЕОРИЯЛЫҚ НЕГІЗДЕМЕСІ

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Аңдатпа

Мақалада Нильс Бордың постулаттары, атом құрылысы мен оның тұрақтылығы кванттық тұрғыдан түсіндірілген. Резерфордтың атом моделінің кемшіліктерін жоюға арналған екі негізгі постулаты ұсынылды. Бірінші постулат бойынша, электрон атом ядросын энергия жоғалтпай, тек қатаң белгіленген стационарлық орбиталарда айналып жүреді. Екінші постулат электрондардың бір орбитадан екінші орбитаға ауысу кезінде энергияны кванттар түрінде шығару немесе жұту механизмін түсіндіреді. Бор постулаттары сутегі атомының сызықтық спектрін сәтті түсіндіріп, әртүрлі элементтердің спектрлік сызықтарының пайда болу табиғатын ашуға мүмкіндік берді. Теориялық негіздеме ретінде Бор Планктың кванттық гипотезасына сүйенді, мұнда энергияның квантталуы принципі атом деңгейінде қолданылады. Бұл постулаттар атом физикасында революциялық өзгерістер әкеліп, кванттық механика мен толқындық механиканың дамуына ықпал етті. Бор теориясы электрондардың дискретті энергия деңгейлерін анықтап, атомдық құрылымның кванттық сипаттамаларын түсіндіруге алғашқы қадам жасады.

Түйін сөздер: постулат, кванттық, электрон, стационарлық, теориялық негіздеме, механика

ТЕОРЕТИЧЕСКОЕ ОБОСНОВАНИЕ ПОСТУЛАТОВ НИЛЬСА БОРА

Аннотация

Постулаты Нильса Бора стали первой теоретической основой для объяснения строения атома и его устойчивости с точки зрения квантовой механики. Чтобы устранить недостатки модели атома Резерфорда, Бор в 1913 году предложил два основных постулата, описывающих движение электронов в атоме. Согласно первому постулату, электрон вращается вокруг атомного ядра по строго определенным стационарным орбитам, не теряя энергии. Второй постулат объясняет механизм поглощения или излучения энергии в виде квантов при переходе электрона с одной орбиты на другую. Постулаты Бора успешно объяснили линейчатый спектр атома водорода и позволили раскрыть природу возникновения спектральных линий различных элементов. В качестве теоретического обоснования Бор опирался на квантовую гипотезу Планка, согласно которой принцип квантования энергии применяется на атомном уровне. Эти постулаты произвели революционные изменения в атомной физике и способствовали развитию квантовой

механики и волновой механики. Теория Бора стала первым шагом к объяснению квантовых характеристик атомной структуры и определению дискретных энергетических уровней электронов.

Ключевые слова: постулаты, электрон, революционные, гипотезу, Характеристики

THEORETICAL JUSTIFICATION OF NIELS BOHR'S POST

Abstract

Niels Bohr's postulates became the first theoretical basis aimed at explaining the structure and stability of the atom from a quantum perspective. To address the shortcomings of Rutherford's atomic model, Bohr proposed two main postulates in 1913 to describe the motion of electrons in the atom. According to the first postulate, the electron orbits the atomic nucleus in strictly defined stationary orbits without losing energy. The second postulate explains the mechanism of energy absorption or emission in the form of quanta when an electron transitions from one orbit to another. Bohr's postulates successfully explained the line spectrum of the hydrogen atom and made it possible to uncover the nature of spectral lines of different elements. As a theoretical foundation, Bohr relied on Planck's quantum hypothesis, applying the principle of energy quantization at the atomic level. These postulates brought revolutionary changes to atomic physics and contributed to the development of quantum mechanics and wave mechanics. Bohr's theory was the first step toward explaining the quantum characteristics of atomic structure and defining discrete energy levels of electrons.

Key words: atom, stability, orbits, mechanism, postulates, quantum, discrete

Қысқашы. Бор—атомның алғашқы кванттық теориясын жасаушы, кванттық механиканың негізін қалаушылардың бірі. Ол Бор қағидалары (постулаттары) деп аталған тұжырымдар негізінде атомның орнықтылығын және сутек тәрізді атомдардың спектрлік заңдылықтарын түсіндірді. Бор теориясы бойынша атомның орнықты (стационар) күйдегі энергиясының үзілісті (дискретті) мәндерге ие болатындығы алынғанымен, электрон шеңбер не эллипс тәрізді орбита бойымен қозғалатын классикалық бөлшек ретінде қарастырылады. Бұл теорияда Л. де Бройль ашқан микробөлшектердің толқындық қасиеті ескерілмейді. Атом құрылысының және оның ішінде өтетін түрлі процестердің толық теориясы кванттық механика заңдары ашылған соң ғана жасалды. Бор 1923 ж классикалық және кванттық ұғымдар арасындағы сәйкестік принципін ашты. Сол жылы өзі жасаған атом моделі негізінде, алғаш рет Дмитрий Менделеевтің элементтердің периодтық жүйесіне ғыл. түсініктеме берді. 1927 ж микродүниенің ең маңызды принциптерінің бірі — толықтырғыштық принципін тұжырымдады. Мұның философия ғылымы үшін маңызы зор болды. Ол құранды ядро теориясының авторы (1936). 1939 ж америкн физигі Дж. Уилермен бірге ядроның бөліну механизмін түсіндірді. Уран ядросының өздігінен бөлінуін болжады. 20 ғасырдың 40 – 50-жылдары негізінен, элементар бөлшектердің белгілі бір ортамен әсерлесу мәселесін зерттеді. Ол дүние жүзі физиктерінің (Ф.Блох, О.Бор, В.Вайскопф, Х.Казимир, О.Клейн, Х.Краммерс, Л.Д.Ландау, Л.Розенфельд, Дж.Уилер, т.б.) үлкен мектебін ұйымдастырды, олардың арасындағы ғыл. шығармашылық байланысты дамытты. Бор — Нобель сыйлығының лауреаты (1922), дүние жүзіндегі 20-дан астам ғылым академиясының, оның ішінде КСРО ғылым академиясының (1929) құрметті мүшесі.

Негізгі бөлім. Атомның ядролық моделі α -бөлшектердің жұқа алтын фольгадан шашырауын дұрыс түсіндіргенімен екінші жағынан басқа қиындыққа жолықты. Оның мәнісі мынада болатын. Классикалық электродинамика заңдары тұрғысынан атомның планетарлық моделі тәріздес жүйелер орнықты болмауы тиіс еді. Себебі, электрон ядроны айнала үдей қозғалатын болғандықтан өзінен электромагниттік сәуле шығаруы тиіс. Ал бұлай

сәуле шашу оның энергиясын кемітеді де соның салдарынан электронның айналу радиусы бірте-бірте кеміп, түбінде ол ядроға құлап түсуі тиіс болатын. Бірақ тәжірибе бұған мүлдем кері нәтиже береді. Атом орнықты жүйе және ол қозбаған күйде болса өзінен ешқандай да сәуле шығармайды.

Теория мен тәжірибенің арасындағы осындай қарама-қайшылықты шешу жолында ғалымдарға біраз тер төгуге тура келді. Бұл бағыттағы зерттеулер барысында алғашқы елерліктей табысқа дат ғалымы Нильс Бор жетті. Ол классикалық физиканың атомдық жүйеге қатысты барлық көзқарастарын қайта қарай келіп, оның атомдарға қатысты жаңа тәжірибелік деректерді түсіндіруге дәрменсіз екеніне көзі жетті. Бұл жерде классикалық физика ұғымдарының ауқымынан тысқары шығу қажет болатын. Бор қағидалары, Бор постулаттары – даниялық физик Нильс Бордың атомның орнықты (стационар) күйін және спектрлік заңдылықтарын түсіндіруге арналған негізгі болжамдары (1913). Бір кездері атомның планеталық моделін Резерфорд ұсынған. Шын мәнінде, бұл денелердің қозғалысы туралы классикалық түсініктерді атомдық масштабтағы құбылыстар аймағына ауыстырудың сәтсіз әрекеті болды. Планетарлық модель мүмкін емес болып шықты, өйткені электрондар орбитада қозғалатын үдеудің әсерінен атом тұрақсыз болды. Мұндай жағдайларда электрондар өз энергиясын электромагниттік сәулеленуге тез жұмсап, ядроға түсуі керек.



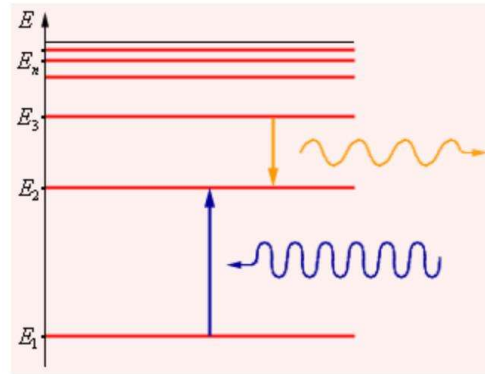
Классикалық атомның тұрақсыздығы.

Нильс Бор постулаттары – атомның құрылысы мен оның қасиеттерін түсіндіруге арналған негізгі қағидалар жүйесі. Бор постулаттары атомдық физикада үлкен рөл атқарып, атомның кванттық теориясының қалыптасуына негіз салды. Бұл постулаттар классикалық физика заңдарымен үйлеспейтін құбылыстарды түсіндіруге мүмкіндік беріп, жаңа физикалық түсініктердің дамуына ықпал етті.

Бірінші постулат: Электронның стационарлық орбиталары

Бордың бірінші постулаты бойынша, электрон атом ядросын белгілі бір стационарлық орбиталарда айналып жүре алады, әрі сол кезде ол энергиясын жоғалтпайды. Классикалық физика заңдарына сәйкес, зарядталған бөлшек шеңберлі қозғалыста үнемі энергия жоғалтуы керек, ал бұл атомның тұрақсыздығына әкеледі. Алайда, Бор атомның белгілі бір орбиталарда электронның энергия жоғалтпай қозғалатынын атап өтті. Классикалық механикаға сәйкес ядро айналасындағы орбитада қозғалатын электронның энергиясы кез келген болуы мүмкін. Осыған байланысты бордың алғашқы постулаты атомның планеталық моделімен де, классикалық механикамен де айқын қайшылықта болады. Стационарлық күйлердің постулаты электродинамика принциптеріне де қайшы келеді, өйткені ол электромагниттік толқындардың сәулеленуінсіз электрондардың жылдам қозғалуына мүмкіндік береді. Мұның бәрі энергия деңгейлері жүйесінің арқасында мүмкін. Деңгейлердің әрқайсысы белгілі бір кванттық күйге сәйкес келеді. Атом ядросының

айналасында айналатын Электрон кейбір механикалық энергияға ие. Атомның тұрақты күйінде ядро айналасында тұйық траектория бойымен қозғалатын электронның механикалық энергиясы теріс болады: $E_n < 0$. Егер $E_n \geq 0$, иондану пайда болғанға дейін, яғни электрон ядродан алыстай бастайды.

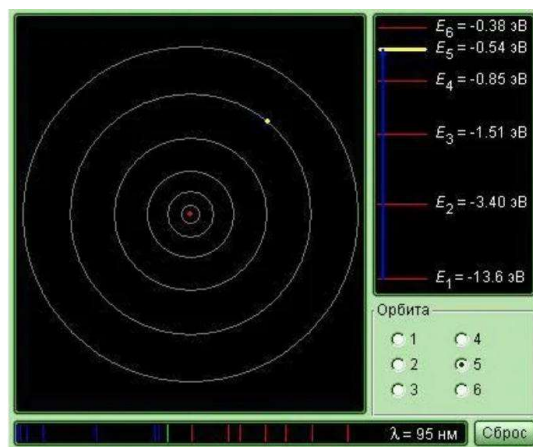


Атомның энергетикалық деңгейлері және фотондарды сіңіру және шығару процестерінің шартты бейнесі.

Энергиямен күй E_1 — бұл атомның негізгі күйі. Шамасы *орен* E_1 — бұл иондану энергиясы.

Екінші постулат: Энергияның квантталуы

Бордың екінші постулатына сәйкес, электрон бір орбитадан екінші орбитаға өткенде энергияны квант түрінде жұтады немесе шығарады. Бұл квант энергиясы электронның екі орбита арасындағы энергия айырмасына тең, және ол Планк тұрақтысына және жарық жиілігіне байланысты анықталады.



Модель бор постулаттары.

Бұл формула жарықтың сызықтық спектрлерін түсіндіруге мүмкіндік береді, себебі әрбір элементтің өзіне тән энергия деңгейлері болады. Бор постулаттары Резерфорд моделімен салыстырғанда атомның тұрақтылығы мен спектрлік сызықтарды түсіндіруге жақсы мүмкіндіктер берді. Мысалы, сутегі атомы спектрінің сызықтық құрылымы Бор теориясымен жақсы сәйкес келеді. Бұл теория электрондардың орбиталарының энергия деңгейлеріне сәйкес дискретті екенін көрсетті. Бор теориясы көптеген тәжірибелерде расталды және кванттық физиканың дамуындағы маңызды қадам болды.

Бор постулаттары атомдық құрылымды түсіндіруде үлкен жетістікке жетсе де, олар кейбір кемшіліктерден арыла алмады:

- Бор моделі тек бір электронды атомдар үшін, мысалы, сутегі атомы, үшін ғана дұрыс нәтиже берді. Көп электронды атомдарда бұл модель күрделі жағдайларды түсіндіре алмады.
- Орбиталардың нақты формасы мен орналасуы туралы ақпаратты бермеді.

- Электронның корпускулярлы-толқындық қасиеттерін ескермеді. Кейінірек кванттық механика дамып, бұл мәселелер шешімін тапты. Де Бройльдің электронның толқындық қасиеттерін ашуы, Шредингердің толқындық теңдеуі, Гейзенбергтің анықталмағандық принципі Бор теориясын одан әрі дамытып, жаңа түсініктердің қалыптасуына әкелді. Осылайша, атом туралы қазіргі кванттық-механикалық теория құрылды.

Осылайша, атомдағы электронның энергиясы негізгі кванттық санның мәнімен анықталады.

Жоғарыдағы теңдеулерді қолдана отырып, Бор сутегі атомының сәулелену спектрін есептеді. Бордың есептеулері эксперименталды түрде алынған нәтижелермен керемет келісімге келді. Спектрлік сызықтарды егжей-тегжейлі зерттеу кезінде олардың кейбіреулері бір емес, бірнеше жақын орналасқан сызықтар екені белгілі болды. Бұл электрондардың энергия мәндері жақын болатын әртүрлі орбиталар бар екенін көрсетті. Бұл фактіні түсіндіру үшін Sommerfeld электрондар тек дөңгелек емес, эллиптикалық орбиталарда да айнала алады деп ұсынды. Алайда, Бор теориясы әмбебап болған жоқ. Оның позицияларынан магнит өрісіндегі сутегі атомының әрекетін сипаттау мүмкін болмады. Сутегі молекуласының түзілуін де түсіндіру мүмкін емес, көп электронды атомдарды сипаттауда принципті сипаттағы еңсерілмейтін қиындықтар туындайды. Бұл қиындықтар кең теория - толқындық немесе кванттық механика тұрғысынан еңсерілді. Микроәлемде болып жатқан құбылыстарды сипаттайтын заңдар мінез-құлқын сипаттайтын заңдардан айтарлықтай ерекшеленеді макротел. Бор теориясына жасанды түрде енгізілген N кванттық саны кванттық теория тұрғысынан жалпы заңдардың сөзсіз салдары болып табылады. Осылайша, атомдағы электронның энергиясы негізгі кванттық санның мәнімен анықталады. Жоғарыдағы теңдеулерді қолдана отырып, Бор сутегі атомының сәулелену спектрін есептеді. Бордың есептеулері эксперименталды түрде алынған нәтижелермен керемет келісімге келді.

Спектрлік сызықтарды егжей-тегжейлі зерттеу кезінде олардың кейбіреулері бір емес, бірнеше жақын орналасқан сызықтар екені белгілі болды. Бұл электрондардың энергия мәндері жақын болатын әртүрлі орбиталар бар екенін көрсетті. Бұл фактіні түсіндіру үшін Sommerfeld электрондар тек дөңгелек емес, эллиптикалық орбиталарда да айнала алады деп ұсынды. Алайда, Бор теориясы әмбебап болған жоқ. Оның позицияларынан магнит өрісіндегі сутегі атомының әрекетін сипаттау мүмкін болмады. Сутегі молекуласының түзілуін де түсіндіру мүмкін емес, көп электронды атомдарды сипаттауда принципті сипаттағы еңсерілмейтін қиындықтар туындайды. Бұл қиындықтар кең теория - толқындық немесе кванттық механика тұрғысынан еңсерілді. Микроәлемде болып жатқан құбылыстарды сипаттайтын заңдар мінез-құлқын сипаттайтын заңдардан айтарлықтай ерекшеленеді макротел. Бор теориясына жасанды түрде енгізілген N кванттық саны кванттық теория тұрғысынан жалпы заңдардың сөзсіз салдары болып табылады.

Стационарлық күйлердің постулаты электродинамика принциптеріне де қайшы келеді, өйткені ол электромагниттік толқындардың сәулеленуінсіз электрондардың жылдам қозғалуына мүмкіндік береді. Мұның бәрі энергия деңгейлері жүйесінің арқасында мүмкін. Деңгейлердің әрқайсысы белгілі бір кванттық күйге сәйкес келеді. Атом ядросының айналасында айналатын Электрон кейбір механикалық энергияға ие. Атомның тұрақты күйінде электронның механикалық энергиясы ядро айналасында тұйық траектория бойымен қозғалады.

Қорытынды. Нильс Бор постулаттары атом құрылымы мен оның қасиеттерін түсіндіруде үлкен маңызға ие болды. Олар атомдық физиканың дамуына, сондай-ақ кванттық механиканың негізін қалауға елеулі үлес қосты. Бор постулаттары қазіргі заманғы

ғылымда қолданылмаса да, оның қағидалары физиканың тарихында маңызды орын алады және атомдық теорияның қалыптасуында шешуші рөл атқарды.

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PLANETLƏR MÖVZUSU

Orucova Nurcahan Rasim qızı

Azərbaycan Dövlət Pedaqoji Universitetinin nəzdində, Azərbaycan Dövlət Pedaqoji kollecinin müəllimi

Xülasə. Planetlər, kosmosda ulduz ətrafında dövr edən və öz cazibə qüvvəsi ilə müəyyən bir struktur və şəraitə sahib olan cisimlərdir. Onlar yalnız ulduzlardan işıq almaqla deyil, öz cazibə qüvvələri ilə daxili strukturlarını da qoruyurlar. Günəş sistemində yer alan 8 planet müxtəlif ölçü, tərkib və xüsusiyyətlərə malikdir. Bu məqalədə, planetlərin növləri, xüsusiyyətləri və onların Günəş sistemindəki yerini müzakirə edəcəyik.

Planetlər, müxtəlif parametrlərə görə fərqlənir. Ən ümumi təsnifatə görə, onlar daşlı (daşlı) və qazlı planetlərə bölünür. Daşlı planetlər əsasən səthində sərt, qayalıq və metallar olan, qazlı planetlər isə əsasən qazlardan ibarət atmosferə malik olan böyük cisimlərdir.

Açar sözlər: *Planet, kosmos, cazibə, ulduz, Günəş, atmosfer*

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PLANET THEME

Summary. Planets are objects that orbit a star in space and have a certain structure and condition due to their own gravity. They not only receive light from stars, but also protect their internal structure with their own gravity. The 8 planets in the solar system have different sizes, compositions and properties. In this article, we will discuss the types, properties of planets and their location in the solar system.

Planets differ according to various parameters. According to the most general classification, they are divided into rocky (rocky) and gaseous planets. Rocky planets are large objects with a hard, rocky and metal surface, while gaseous planets are large objects with an atmosphere consisting mainly of gases.

Keywords: *Planet, space, gravity, star, Sun, atmosphere*

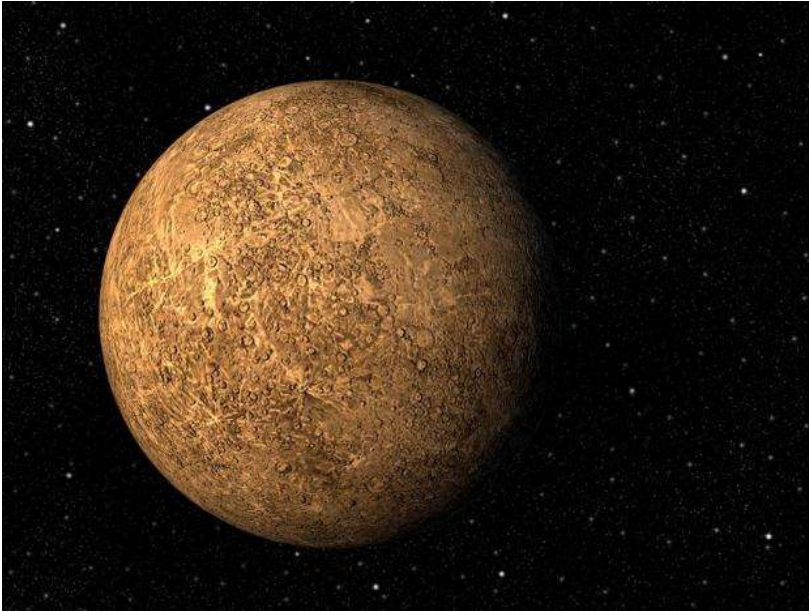
Aktuallıq:

Daşlı planetlər:

- Merkuri
- Venera
- Yer
- Mars

Qazlı planetlər:

- Yupiter
- Saturn
- Uran
- Neptun



Merkuri, Günəşə ən yaxın planetdir və ölçüləri ilə Yerin təxminən 38%-i qədərdir. O, çox sıx bir atmosfərə malik deyil, bu səbəbdən üzərindəki temperatur böyük fərqlərlə dəyişir. Gündüzləri çox isti, gecələri isə son dərəcə soyuq olur. Merkuri üzərində həyat üçün şərait mövcud deyil, çünki burada atmosferin olmaması səbəbindən havada oksigen, su buxarı və digər həyatı dəstəkləyən maddələr yoxdur.



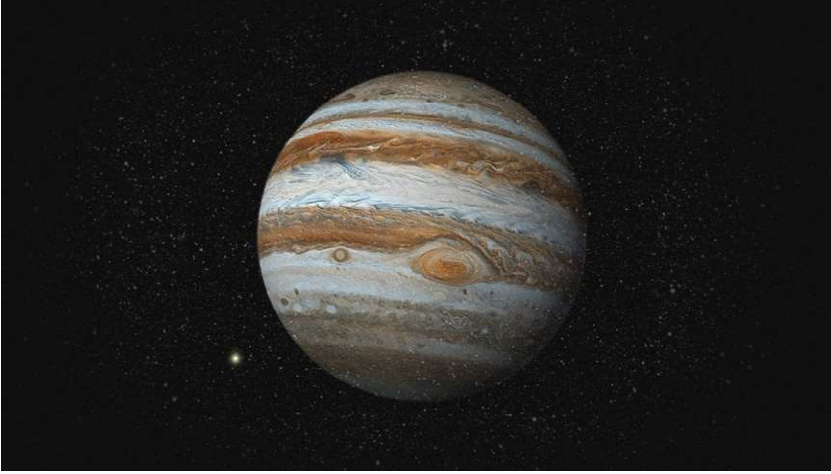
Venera, Yerin ölçüsünə yaxın olan ikinci planetdir. Onun atmosferi çox sıx və zəhərlidir, əsasən karbon dioksiddən ibarətdir. Bu atmosfer planetin səthinə çox yüksək təzyiq tətbiq edir və Veneranın səthi 460°C-ə qədər isinir. Bu səbəbdən Venera, həyat üçün çox əlverişsizdir. Həmçinin, atmosferindəki buludlar davamlı olaraq şiddətli şimşəklər və qasırğalar yaradır.



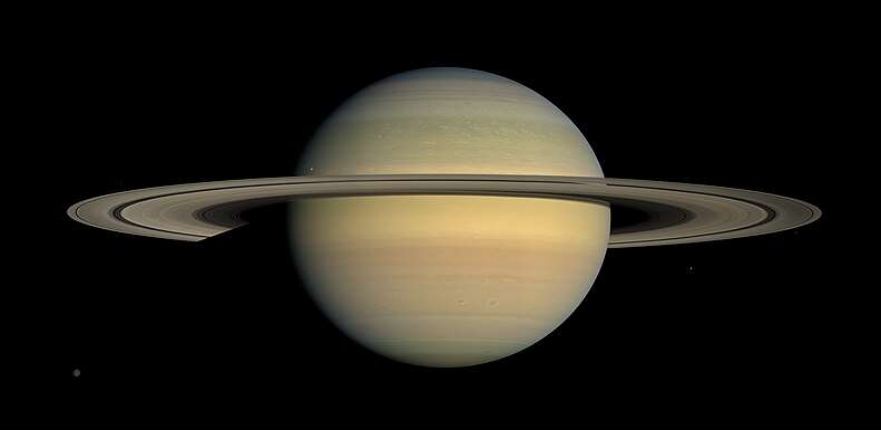
Yer, üzərində həyatın mövcud olduğu yeganə planetdir. Atmosferində oksigen və azotun üstünlük təşkil etməsi, suyun mövcudluğu və mülayim temperatur şəraiti burada həyatın inkişafını mümkün etmişdir. Yer üzərində müxtəlif bioloji və geoloji proseslər, o cümlədən yağışlar, küləklər və vulkanizmin fəaliyyəti həyat üçün lazımı şəraiti təmin edir. Həmçinin, Yerin maqnit sahəsi kosmik radiasiyalardan qorunmasını təmin edir.



Mars, "qırmızı planet" kimi tanınır, çünki atmosferindəki dəmir oksid (rust) səbəbindən səthi qırmızı rəngdədir. Marsda atmosfer çox incədir və əsasən karbon dioksiddən ibarətdir. Səthində keçmişdə suyun axdığına dair əlamətlər tapılıb və bu, Marsda həyatın mövcud olub-olmaması ilə bağlı mübahisələri gündəmə gətirir. Marsda atmosfer çox incə olduğundan, planetin səthində həyat üçün şərait yoxdur. Lakin, elm adamları Marsda gələcəkdə suyun mövcudluğu və potensial həyat formalarının araşdırılmasına davam edirlər.



Yupiter, Günəş sistemindəki ən böyük planetdir. Onun kütləsi, bütün digər planetlərin kütləsindən daha çoxdur. Yupiterin atmosferi əsasən hidrogen və heliumdan ibarətdir, amma planetin iç qatlarında daha mürəkkəb maddələr və kimyəvi reaksiyalar mövcuddur. Yupiterin ən məşhur xüsusiyyətlərindən biri "Böyük Qırmızı Ləkə" adlı nəhəng bir qasırğadır, bu qasırğa artıq yüzlərlə ildir ki, Yupiterin atmosferində müşahidə olunur. Yupiterin ayları çoxdur, bunlardan ən böyüyü olan Ganymede, Günəş sistemindəki ən böyük aydır.



Saturn, öz möhtəşəm halqaları ilə məşhurdur. Halqalar, əsasən suyun, buzun və daşların qarışığından ibarət olan hissəciklərdən meydana gəlir. Saturnun atmosferi əsasən hidrogen və heliumdan təşkil olunmuşdur və planet çox az sıxlığa malikdir. Saturnun halqaları onun cazibə qüvvəsinin təsiri altında olan kiçik ayların və bərk cisimlərin qırılması nəticəsində yaranmışdır.



Uran, çox soyuq və qazlı planetdir. Onun atmosferi əsasən hidrogen, helium və metandan ibarətdir. Uranın digər planetlərdən fərqi odur ki, o, öz orbitində çox əyri şəkildə dövr edir. Bu xüsusiyyət planetin "kənəlsüz" bir şəkildə dövr etməsi ilə izah olunur. Uranın atmosferi çox zəif,

lakin metan qazı planetin mavi rəngini təmin edir. Uranın halqaları olduqca qaranlıq və incədir, buna görə də astronomlar tərəfindən tam anlaşılan deyil.



Neptun, Günəşdən ən uzaq planetdir və Uranla çox bənzəyir. Neptunun atmosferi də əsasən metan qazı ilə zəngindir və buna görə də planet mavi rəngdə görünür. Neptunda çox yüksək sürətli küləklər və nəhəng qasırğalar mövcuddur. Neptunun ən böyük ayı Triton, planetin cazibə qüvvəsinə qarşı əks bir hərəkət edir ki, bu da onun qeyri-adi bir xüsusiyyəti kimi qeyd edilir.

Planetlərin həyat üçün uyğunluq dərəcəsi müxtəlif amillərlə müəyyən olunur. Bu amillər arasında atmosferin tərkibi, suyun mövcudluğu, temperatur və radiasiyanın miqdarı kimi faktorlar yer alır. Yer, həyatın mövcud olduğu tək planet olaraq bilinməyə davam edir. Marsda keçmişdə suyun mövcudluğu ilə bağlı tapıntılar, bəzən orada həyatın mövcud olub-olmaması haqqında mübahisələrə səbəb olur. Digər planetlər isə müxtəlif səbəblərdən həyat üçün əlverişsizdirlər, məsələn, çox yüksək və ya aşağı temperatur, zəhərli atmosfer və ya suyun olmaması kimi amillər. Planetlər, Günəş sistemi daxilində və ümumilikdə kainatdakı müxtəlif tərkib və xüsusiyyətlərə malik cisimlərdir. Hər bir planetin tərkibi, atmosferi və geoloji fəaliyyəti həyatın mövcudluğunu və inkişafını müəyyən edir. Gələcək tədqiqatlar və kosmosun araşdırılması, digər planetlərdə həyatın mövcudluğuna dair yeni tapıntılar və anlayışlar əldə etməyə imkan verəcək. Həyatın yalnız Yer üzündə mövcud olması bəlkə də zamanla dəyişə bilər, amma hazırda Yerin həyat üçün ən əlverişli şəraitə sahib olduğu məlumdur.

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Historical Sciences

THE ROAD TO THE SIGNING OF THE AGREEMENT OF THE CENTURY

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Key words: Agreement of the century, independence, oil fields, agreement, Caspian Sea

After Azerbaijan gained independence, the main goal was to introduce Azerbaijan to the world. One of the things done to realize this was the entry of foreign investors into Azerbaijan and the implementation of capital flow to certain areas of the economy. Shortly after coming to power, the great leader Heydar Aliyev implemented a world-wide policy called the Contract of the Century. With this, Azerbaijan began to be recognized by world countries for its development rate.

After the dissolution of the Soviet Union in 1991 and Azerbaijan's declaration of independence, the country decided to attract Western investments to implement projects related to the development of its oil reserves. Meanwhile, international companies had shown interest in the oil fields discovered in the Azerbaijani sector of the Caspian Sea in the 1980s. These companies initially focused on the oil reserves of the "Chirag" and "Azari" fields. In January 1991, the Azerbaijani government began to announce tenders for the development of these projects. BP, Statoil, Amoco, Unocal, and other companies joined the project. In 1991, Amoco, BP, McDermott, Pennzoil, Ramco, Unocal, TPAO, and a group of other foreign companies, including Statoil, initiated negotiations with Azerbaijan regarding the improvement of the "Chirag" and "Gunashli" fields in the Azerbaijani sector of the Caspian Sea, with a planned duration of three years. Negotiations continued throughout this period regarding joint production of large oil fields [1. pp. 9-10] .

In 1992, companies interested in working in the Caspian's oil fields came together in a consortium and held meetings. The State Oil Company of Azerbaijan (SOCAR) and the Elchibey administration signed an agreement with the Azerbaijan International Oil Consortium (AIOC) regarding the development of the oil fields, with the condition that 30% of the project (SOCAR) must be retained. In 1993, SOCAR issued a declaration regarding the joint exploitation of the "Azari", "Chirag", and "Gunashli" fields. Six memorandums of agreement were signed in May 1993 regarding these fields. According to the agreements, negotiations were supposed to continue in London in June 1993. However, in June 1993, the political situation in the country changed [3] . One year before the signing of the "Contract of the Century," there was economic, political, and military turmoil. Due to a change in leadership in Azerbaijan, the negotiations ended without results. On June 18, 1993, Surat Huseynov carried out a military coup, and President Abulfaz Elchibey was overthrown. That year, after the election of Heydar Aliyev as the new president of Azerbaijan, the aforementioned oil contract was annulled. The foreign companies leading the negotiations held meetings with President Heydar Aliyev. The country was on the brink of civil war, but with Aliyev's rise to power, the overall situation in the country began to stabilize [5].

In the mid-1990s, negotiations were held with foreign companies for the joint development of the oil fields in Azerbaijan's sector of the Caspian Sea. During these negotiations, oil from not only Azerbaijan but also Kazakhstan and Turkmenistan was transferred to Baku. After Heydar Aliyev came to power, negotiations regarding the development of the Azeri, Chirag, and Gunashli fields resumed in February 1994. In April 1994, SOCAR officially announced that Russia's "Lukoil" company would acquire 10% of Azerbaijan's shares in the consortium. The companies in

the consortium took into account potential pressure that Russia might apply in the future, as they controlled the Volga River and could block the passage of heavy cargo ships. As a result, the agreement was revised by including Russia in the consortium, and 10% of SOCAR's shares were transferred to Russia [.

After nearly three years of negotiations, the "Contract of the Century" was signed on September 20, 1994, at the Gulistan Palace in Baku. The "Agreement on the Joint Development and Production Sharing of Oil from the Azeri, Chirag, and Gunashli fields in the Azerbaijani sector of the Caspian Sea" was signed, and the authority to explore and extract oil in the relevant areas was granted to AIOC. The agreement was signed by six countries (the USA, the UK, Norway, Turkey, Russia, and Saudi Arabia) and 10 international oil companies, including BP, Amoco, Lukoil, Pennzoil, Unocal, Statoil, and others. The agreement was ratified by the Azerbaijani National Assembly on December 2, 1994, and came into effect on December 12, 1994. At the time of signing in 1994, it was estimated that the Azeri-Chirag-Gunashli (ACG) fields held 511 million tons of oil, but the actual reserves exceeded these predictions [6]. Currently, it is estimated that 500 million tons of oil still remain to be extracted from ACG. According to the new agreement, BP will remain the operator of the project. As part of the agreement, SOCAR's share in ACG will increase from 11.65% to 25%, and the international partner companies will pay a \$3.6 billion bonus to the State Oil Fund of Azerbaijan (SOFAZ).

After the agreement was ratified, the new shares of the ACG partners are as follows: BP – 30.37%, AzACG (SOCAR) – 25%, Chevron – 9.57%, Inpex – 9.31%, Statoil – 7.27%, ExxonMobil – 6.79%, TP – 5.73%, Itochu – 3.65%, ONGC Videsh Limited (OVL) – 2.31%.

The new terms of the agreement not only reflect the growing financial and technological potential of our country and company since 1994 but also demonstrate the confidence of foreign partners in Azerbaijan's economy, elevating our partnership to a new level. The new terms of the contract not only reflect the growing financial and technological potential of our country and company since 1994, but also demonstrate the confidence of foreign partners in the Azerbaijani economy, taking our partnership to a new level.

From the moment the "Contract of the Century" was initiated, a turning point occurred in the Azerbaijani economy, and significant projects began. First, in 1995, the Chirag-1 platform was restored according to Western standards as part of the initial oil production project, and its upper module was modernized with new drilling equipment to facilitate the drilling of high-angle wells. The new drilling rig allowed for the drilling of horizontal wells in the layers. High-angle production wells such as A-18 (deviation of 5500 m), A-19 (deviation exceeding 6300 m), and others were brought into operation with significant oil production. Oil production from the Chirag field began in 1997.

In December 1999, the first tanker filled with Azerbaijan's "profit oil" was sent to global markets. The foreign currency obtained from the sale of this oil was directed to the State Oil Fund of the Republic of Azerbaijan, created by our national leader Heydar Aliyev, benefiting the people. The Azerbaijani section of the Baku-Novorossiysk oil pipeline, which is 231 km long and has a diameter of 720 mm, was restored and constructed, and on October 25, 1997, Azerbaijan's oil was first transported to the Novorossiysk port in the Russian Federation. The pipeline has an annual transport capacity of 6.1 million tons.

Azerbaijan has maintained full control and management over its oil and gas fields by law. According to the terms of the contract, Azerbaijan has fully preserved ownership rights over these three oil fields. Despite significant pressure and opposition, the contract was signed, marking an important step for Azerbaijan. There was serious resistance to the signing of the "Contract of the Century" both domestically and abroad. However, despite all these difficulties, Azerbaijan achieved its goal. This was a success for Azerbaijan's economic diplomacy and the state as a whole.

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TARİX DƏRSLƏRİNDƏ QIYMƏTLƏNDİRMƏ VƏ ONUN TƏTBİQİ MƏSƏLƏLƏRİ

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XX əsrin sonlarından etibarən təhsildə keyfiyyətin qiymətləndirilməsi ilə bağlı yeni yanaşmalar irəli sürüldü. Bu yanaşmalar təhsil sahəsində şagirdlərin təlimdəki göstəricilərinin rolunu və əhəmiyyətini yüksəldir, onu müxtəlif amillərlə əlaqələndirir:

- Təhsil Nazirliyi tərəfindən optimal tədris-təcrübi layihələrin hazırlanması və həyata keçirilməsi;
- ümumtəhsil müəssisələri rəhbərlərinin səriştəli nəzarət və idarəetmə mövqeyi nümayiş etdirməsi;
- təlimin səmərəli təşkili;
- təhsilalanların zəruri tələbatlarının yerinə yetirilməsi;
- maddi-texniki təchizata müvafiq qiymətləndirmə vasitələri ilə təmin olunma.

Uzun illər pedaqoji ədəbiyyatda, eləcə də məktəb təcrübəsində qiymətləndirmə məfhumuna yalnız təhsilalanların təlim müvəffəqiyyətinin pedaqoqlar tərəfindən aşkara çıxarılması vasitəsi kimi yanaşılmışdır. Əslində qiymətləndirmə fərz edilən qədər məhdud mexanizm deyil, onun geniş bir anlayış olduğunu, nə qədər əhəmiyyətə malik olduğunu yalnız şagirdlərin nailiyyət göstəricisi kimi deyil, habelə ümumilikdə pedaqoji kadrlar kollektivinin hər birinin məktəbə rəhbərliyi, fərdi yanaşdıqda təlim prosesinin, məktəbdənkənar, sinifdən xaric tədbirləri, şagirdlərin davranışını, valideyn-məktəb əlaqələrinin səviyyəsinin monitorinqi və qiymətləndirilməsini əhatə etdiyini aydınlaşdırmaq mümkündür.

Görkəmli pedaqoq-metodist Əjdər Ağayev təlim prosesinin ənənəvilikdən müasirliyə keçidini izah edərkən, öyrənilən və öyrədilən biliklərin məzmunu, elmin, texnologiyanın inkişafı ilə yeniləndiyini, müasirləşdiyini qeyd edərkən, qiymətləndirmənin məzmununda əsaslı yeniliklərin olmasını vurğulamışdır. O, cəmiyyətin inkişafı nəticəsində yaranan bu yenilikləri mütərəqqi hal olaraq qəbul etmişdir [1, s.26]. Cəmiyyət inkişaf etdikcə şagirdlərin informasiya mənbələri çoxalır, təfəkkürləri inkişaf edir, idrak fəaliyyətləri özlərindən bir neçə on illik sonrakı şagirdlərlə müqayisədə yüksək səviyyədə olurlar. Biz bu irəliləyişləri və uğurları əlbəttə ki, müsbət nəticələrdə, yekun qiymətləndirmələrdə müşahidə edirik.

Azərbaycan tarixi təliminə verilən tələblərin yüksək səviyyədə yerinə yetirilməsinə tarix müəllimləri xüsusilə diqqət ayırmalıdırlar. Məktəblilərin milli-vətənpərvərlik, yüksək vətəndaşlıq ruhunda tərbiyə olunmasında tarix təliminin məzmununun zənginləşdirilməsinin böyük əhəmiyyəti vardır.

Tarix təlimində şagird müvəffəqiyyətlərinin yüksək keyfiyyətinə nail olunmasında təhsil iştirakçılarının əsaslı maraqları vardır:

- dövlətin milli təhsil sisteminin inkişaf etdirilməsi maraqlarının reallaşdırılmasında onun ali dövlət orqanı – Təhsil Nazirliyinin böyük səyləri ümumtəhsil pilləsində “hədəf strategiyası”nı doğrultmaqdır, istənilən nəticəyə nail olmaqdır;
- Məktəbləri idarə edənlərin əsas məqsədi təlim-tədris işini ümumi qaydalar normasında təşkil edib, müvəffəq nəticəyə nail olmaqdır;
- Valideynlərin ən böyük istəyi övladlarının digər yoldaşlarından geri qalmaması, təlim nəticələrinin qənaətbəxş olmasıdır;
- Hər bir məktəblinin ən böyük arzusu, (hətta ən zəif şagirdin) nəticələrinin yüksək olmasıdır [5, s.627].

Təhsili təmsil edənlərin maraqları yüksək nailiyyət əldə etməyə yönəlsə və bu sahədə hər bir təmsilçi məsuliyyətlə icranı həyata keçirərsə, əlbəttə hamılıqla yüksək dəyər, uğur qazanacağıq.

Tarix təlimində şagirdlərin bilik, bacarıqlarının bal şkalası ilə qiymətləndirilməsində fərdi yanaşma prinsipi hər bir şagirdin mənimsəmə səviyyəsini dəqiq müəyyən etmək baxımından çox əlverişlidir. Bu zaman şagird nəzəri cəhətdən öyrəndiyi tarixi proseslərin qanunauyğunluqlarını əyani şəkildə təcrübəyə tətbiq edirlər.

Pedaqoji fəaliyyət zamanı müəllim qiymətləndirmədən sanki silah kimi istifadə edir [5, s.614]. Ancaq bu zaman müəllim qiymətləndirmə səlahiyyətindən həm pedaqoji həm də psixoloji cəhətdən düzgün istifadə etməlidir.

Qiymətləndirmənin istər ənənəvi, istərsə də fəal təlim prosesində aktuallığından, əhəmiyyətindən bir çox metodistlər bəhs etmişdirlər. Tanınmış rus pedaqoqu İ.Y.Lerner öz tədqiqat işlərində qiymətləndirmənin xarakterik xüsusiyyətlərini, əhəmiyyətini nəzərə çatdıraraq, onun əsas vasitələri kimi, yoxlama-nəzarətə əsaslanan şifahi, yazılı texniki vasitələrlə hesaba almanı xüsusi qeyd etmişdir [15, s.52].

A.A.Vagin ənənəvi üsulla tarixin təlimi prosesində cari ev tapşırığının yerinə yetirilməsini yoxlamaq və qiymətləndirmək məqsədilə aşağıdakı prosedurların yerinə yetirildiyini qeyd edir:

- tapşırılan dərsin əsas məsələlərinə dair siniflə yoxlama müsahibəsi;
- sinif şagirdlərini mənimsənilmiş dərsin əlaqəli şəkildə öyrənilməsinə təmin etmək üçün onları fərdi şəkildə xəritə ilə işləməyə lövhə qarşısına çağırmaq;
- qrafik və yazılı tapşırıqlar üzrə yoxlama;
- cari mövzuya aid yazılı sorğu-sual (10-15 dəqiqəlik) [14, s.405-406].

Adətən, yuxarıda göstərilən yoxlama və qiymətləndirmə vasitələrindən VII -VIII sinif səviyyəsində və ondan yuxarı pillələrdə tətbiq olunurdu.

M.A.İsmixanov, R.Ə.Bəxtiyarova qiymətləndirmə prosesini şagirdin təlim müvəffəqiyyətinə nəzarət, onun biliyinin hesaba alınmasının vacib ünsürü olduğunu qeyd edir. O, pedaqoji nəzarətin bir neçə funksiyanı yerinə yetirir:

- 1) yoxlama (mənimsəmə səviyyəsini üzə çıxarmaq);
- 2) təhsilverici (biliklərin genişləndirilməsi və ümumiləşdirilməsi);
- 3) diaqnostik (səhvləri, çətinlikləri və onların səbəblərini müəyyən etmək);
- 4) proqnostik (mənimsəməni təkmilləşdirmək);
- 5) tərbiyə (təlimə borc və məsuliyyət, özünə inam hissi formalaşdırmaq);
- 6) inkişafetdirici (təhsilalanların zehni qüvvələrini, təfəkkürünü inkişaf etdirmək). Bu funksiyaların hər biri şagirdin düzgün istiqamətlənməsinə, təlimdə yüksək nəticələr əldə etməsinə imkan yaradır [9, s.145-146].

Tarix təlimi prosesində şagirdlərin qiymətləndirilməsini apararkən, məzmun standartlarına əsasən bilik səviyyələrinin, həmçinin bu fənn üzrə konkret təlim fəaliyyətlərinin (idraki, hissi, psixomotor) nəzərə alınması vacib amillərdir. Məhz bu istiqamətdə şagirdlərin fəaliyyətini təşkil etmək, onların təlim nəticələrini məqsədəuyğun qiymətləndirmək müəllimin əsas məqsədi, amalı olmalıdır. Müəllim şagirdlərin təhsilləndirilməsi, tərbiyələndirilməsi işində böyük məsuliyyət daşıyır. Təlim prosesinin aparıcı siması olan müəllim haqqında dəyərli ifadələr səslənmişdir. Ümummilli lider Heydər Əliyev hər zaman öz çıxışlarında müəllimlik peşəsinin ali, şərəfli iş olduğunu iftixarla qeyd etmişdir. Təsədüf deyildir ki, Heydər Əliyev 1998-ci ildə keçirilən müəllimlərin qurultayında müəllimlərin əməyinin dəyərləndirilməsini xüsusi vurğulamışdır. Əsl müəllimin pul, sərvət üçün yox, hər zaman mənəviyyət üçün xidmət etməsindən bəhs etmişdir [6, s.2]. Müəllim şagirdlərdə təlimə maraq yaratmaq üçün, reallaşa biləcək məqsəd seçməli, məktəblilərin maraqlarını, nəticələrini, nailiyyətlərini əvvəlcədən müəyyən etməyi bacarmalıdır. Müəllim sözün əsl mənasında şəxsiyyət yetişdirmək üçün sərf etdiyi zamandan, onun layiqli və dəyərli nəticəsini tələb etməlidir.

Professor Məcid İsmixanova görə, müəllimlər qiymətləndirmə apararkən aşağıdakı şərtlərə əməl etməlidirlər:

- Qiymət obyektiv eləcə də ədalətli verilməlidir, hər bir şagirdin nümayiş etdirdiyi bilik və bacarıqlarının səviyyəsi dəqiq əks olunmalıdır, qiyməti “kəsmək” və “şışirtmək” xəsislik və səxavətlilik etmək kimi təsir bağışlayır. Ancaq bu zaman şagirdlərdə inamsızlıq və arxayınlıq kimi hallar müşahidə edilir;

- Qiymətin şagirdlər tərəfindən anlaşılması vacib şərtidir. Belə ki, müəllim verdiyi rəqəmli qiyməti həm də əsaslandırmalıdır (şagird nə üçün “2”, “3”, “4”, “5” aldığını sözlə xarakterizə etməlidir). Belə olduqda şagirdlər müəllimin obyektiv olduğunu anlayar, öz nöqsanlarının olduğunu başa düşərlər.

- Qiymətləndirilmə aparılarkən şagirdin nəyi öyrənməsi ilə paralel olaraq, necə öyrənməsini nəzərə almaq lazımdır. Şagirdin materialı hansı yolla; - şüurlu və ya əzbərləmə üsulu ilə mənimsəməsinin də əhəmiyyəti böyükdür;

- Qiymət verərkən şagirdin təlim prosesində, dərs ərzində göstərdiyi bilik və fəaliyyəti müəllim tərəfindən nəzərə alınmalıdır [9, s.133-134].

Monitorinqlərin keçirilməsində məqsəd yüksək nəticəyə nail olmaq ideyası, habelə təhsil sistemindəki bəzi nöqsanları aşkarlamaq, daha sonra təhsil keyfiyyətli təhsil quruculuğu yolunda ciddi addımlar atmaqdır. Əgər məktəblərimizdə təhsilin yüksək nailiyyətini istəyiriksə mütləq bu sahədəki qüsurları müntəzəm olaraq izləməli, səmərəli tədbirlər həyata keçirməliyik.

Müasir dövrdə qiymətləndirmə şagirdlərin bütövlükdə inkişaf tempinin xarakterik xüsusiyyətlərini nəzərdə tutur. Elə məhz bu səbəbdən də, təlim nəticələrinin yoxlanılması və qiymətləndirilməsi proseslərinə tanınmış pedaqoqlar A.Həsənov, Ə.Ağayev 4 mühüm cəhətdən yanaşılmasının nəzərə alınmasının əhəmiyyətini qeyd etmişdir:

1. Fənn proqramlarında (kurikulumlarda) nəzərdə tutulmuş həcmə uyğun təlimin məzmununun əks olunması (şagirdə nəyi, hansı həcmdə öyrədirik?);

2. Şagirdi təlim texnologiyaları, üsulları və didaktik vasitələrlə necə öyrədirik?;

3. Təlim prosesi təhsilverici və tərbiyəedici vəzifəni necə yerinə yetirir?;

4. Monitorinq və qiymətləndirmə mexanizmi təlimin bütövlükdə komponentlərini, pedaqoji qanunauyğunluqlarını əhatə edirmi? [7, s.238].

Tarixin interaktiv təlimi nəticələrinin qiymətləndirilməsi təhsil müddətində yetişməkdə olan gənc nəslin milli vətənpərvərlik ideya istiqamətində tərbiyə olunmasında və eləcə də, ahəngdar şəxsiyyət kimi formalaşmasında böyük rol oynayır. Fəal təlimdə qiymətləndirmə dərsin bütün mərhələlərində aparıla bilər. Tarix təlimi nəticələrinin qiymətləndirilməsinin mahiyyəti şagirdlərin tarixə dair biliklərinin mənimsənilməsinin səviyyəsinin aşkar olunmasından ibarətdir. Ümumtəhsil sistemində tarix təliminin məzmunu, məqsəd və vəzifələri, həmçinin pedaqoji prosesdə şagirdlərin tarix təlimi üzrə nailiyyətlərinin qiymətləndirilməsinin rolunu səciyyələndirək:

- tarix təlimi bəşəriyyətin qədim dövrdən indiki günə qədər keçdiyi inkişaf yolu haqqında biliklər toplusudur. Şagirdlər tarixi anlayış və faktları mənimsəməli, müəllim şagirdləri mənimsəmə səviyyəsinə əsasən obyektiv olaraq qiymətləndirməlidir;

- tarix təlimində fakt və hadisələr müqayisəli təhlil edilməli, ümumiləşdirilmələr aparılmalı, şagirdlər hadisələrin səbəb – nəticə əlaqələrini dərk etməli;

- tarixi təcrübənin mənimsənilməsi əsasında təhsilalanlarda tarixə inam və hörmət hissini aşılamaq, humanizm ideya istiqamətini tərənnüm etmək, demokratik dəyərlərə, insan hüquqlarına hörmət, vətənə sevgi, tarixi keçmişimizə bağlılıq, xalqlar arasında əməkdaşlığı, sülhü, qarşılıqlı əlaqəni təbliğ etmək;

- Azərbaycan xalqı ilə yanaşı, digər xalqların tarixinə, mədəniyyətinə hörmət və maraq hissini formalaşdırmaq, ölkəmizin, habelə bəşəriyyətin mədəniyyətini qorumağa çalışmaq;

- tarixin obyektinə bəşər cəmiyyətinin sosial, təbii inkişafını (insan-təbiət-cəmiyyət) öyrənmək.

Tarix təlimi üzrə biliklərin qiymətləndirilməsinin xarakteri bilik sahəsi kimi tarixin xüsusiyyətləri ilə müəyyən olunur, konkret olaraq baş verən hadisələr və onların iştirakçılarının haqqında obyektiv məlumat verməklə yanaşı, subyektiv mövqeləri də ortaq məxrəcə gətirir. Fənn kurikulumlarında bütün fənlərin, habelə tarix fənninin də, özünəməxsus məzmun xətləri və standartları öz əksini tapmışdır. ARTPI-nin elmi nəşrlərində tarix təliminin ümumtəhsil pilləsində məzmun xətləri aşağıdakı qaydada verilmişdir:

- tarixi zaman;
- tarixi məkan;
- dövlət;
- şəxsiyyət;
- mədəniyyət [3, s.213].

Ümumtəhsil məktəblərində tarixin interaktiv təlimi zamanı verilən məzmun xətləri bütün tarix kursları üçün nəzərdə tutulmuşdur. Fəal təlimə əsaslanan tarix dərslərini bu məzmun xətləri olmadan təsəvvür etmək mümkün deyil. Qeyd edək ki, yeni tədris proqramları və eləcə də, dərslərdə mövzuların məzmun standartlarının sinifdən-sinfə qalxdıqca tədricən dərinləşdiyini müşahidə edirik, yəni proqram da müvafiq olaraq dərinləşir. Bu zaman dəyişən əsas standartlar deyil, alt standartlardır.

Tarix təlimi üzrə təhsilənlərin nailiyyətlərinin yoxlanılması və qiymətləndirilməsinin obyektləri aşağıdakılardır:

- tarixi hadisələr, faktlar, o cümlədən zaman ölçü vahidləri – il, gün, terminlər və adlar;
- tarix fənnindən ümumi təsəvvürlər, ideyalar və anlayışlar;
- tarixi hadisələr arasında olan səbəb-nəticə əlaqələri və onların açılması, faktların mahiyyətinin aydınlaşdırılması, eləcə də müqayisə edilməsi (tarixi təhlil etmə, izah etmə);
- tarixdə insanların fəaliyyəti, tarixi hadisə və proseslərin inkişaf istiqamətləri;
- tarixi proseslər və eləcə də, hadisə iştirakçılarına, mədəniyyət qurucularına və s. fərdi münasibət.

Tarix təlimi nəticələrinin qiymətləndirilməsinin şagirdlərin biliklərinin səviyyəsini, onları təcürbəyə tətbiq etmək bacarığını, nəticə çıxarmaq qabiliyyətini müəyyənləşdirmək və s. kimi əhəmiyyəti vardır. Şagirdlərin təlim müvəffəqiyyətlərinin qiymətləndirilməsi aşağıdakı məqsədlərə xidmət edir:

- şagirdlərin irəliləyişlərinin və geriləmələrinin monitorinqi;
- təlimdə müstəqil olaraq qərarların qəbul edilməsi;
- hər bir şagirdin təlim nəticələrinin qiymətləndirilməsi;
- kurikulum üzrə qiymətləndirilmə [2, s.6].

Qiymətləndirmənin nə dərəcədə əhəmiyyətli və etibarlı vasitə olduğunu qiymətləndirmə konsepsiyasında verilən qiymətləndirmə standartlarının reallaşdırılması zamanı müşahidə edirik. Qiymətləndirmə standartları hazırlanarkən ilk öncə fənn üzrə məzmun standartlarının hansı səviyyədə yerinə yetirilməsi əsas götürülərək, dəyişikliklər edilə bilər. Belə ki, qiymətləndirmə standartları imtahanlar təşkil etməklə, maraqlı tərəflərin razılığına əsasən, müvafiq siniflər üzrə nəticələrə baxılmış və minimum, habelə yüksək standartlar təyin edilmişdir. Minimum dedikdə ümumi sinif şagirdlərinin 90 və ya 100%-i tərəfindən mənimsənilən standartlar, maksimum standartlar isə sinif şagirdlərinin 30%-i tərəfindən mənimsənilən standartlar nəzərdə tutulur.

Qeyd edək ki, qiymətləndirmə standartları milli kurikulumda əksini tapan nailiyyət səviyyələrinə uyğun hazırlanır, həm də burada şagirdlərin nəyi bacarmasından daha önəmli olan mütəxəssis rəyləridir. Standartlar hazırlanarkən məktəblər, müəllimlər, müvafiq təşkilatlar tərəfindən birgə müzakirələr aparılır və sonda yekun qərar çıxarılaraq düzəlişlər edilir. Qiymətləndirmə standartları 4 səviyyə üzrə qiymətləndirmə şkalası olub əsasən 2 sualı özündə əks etdirir: 1) nəyi qiymətləndirməli?; 2) nailiyyət səviyyələrini (aşağı, orta, yuxarı) necə müəyyən etməli?

Qiymətləndirmə əhəmiyyətli olduğu qədər aktual, mübahisəli, nəticələrə əsaslanan mexanizmdir. Pedaqoji təcrübələrdə tarixən müxtəlif qiymətləndirmə vasitələrindən istifadə olunub və yeniləri də formalaşmaqdadır. Tarix təlimində şagirdlərin bilik və bacarıqlarını hesaba almaq üçün aşağıdakı qiymətləndirmə vasitələrindən istifadə olunması məqsədə uyğundur:

- şifahi sorğular;
- yazılı tapşırıqlar;
- kollektivlə və qruplarla iş;
- kartoçkalarla iş;
- yazı lövhəsində iş;
- xəritə və mənbələrlə iş;
- testlə iş [3, s.76].

Biliklərin yoxlanılmasını şifahi, habelə yazılı şəkildə təşkil etmək olar. Şifahi yoxlama zamanı başlıca meyar şagirdlərin düşüncələri, təsəvvürləri, qabiliyyətləri, öyrəndikləri nəzəri biliklər sistemini reallıqda tətbiq etmələri olmalıdır. Qabaqcıl pedaqoqların qənaətinə görə, şagirdləri təlim prosesində fəallaşdırmaq üçün diskussiyalara cəlb etmək lazımdır. Xüsusilə də, kiçik yaşlı məktəblilərlə daha çox sorğular və başqa yoxlama üsullarını davamlı olaraq həyata keçirmək lazımdır.

Şifahi sorğular istər ənənəvi təlimdə istərsə də, fəal təlimdə şagirdlərin biliklərinin yoxlanılmasında ən mühüm vasitələrdən biridir. Bu vasitə həm frontal, həm də fərdi qaydada həyata keçirilir. Frontal sorğuların keçirilməsində məqsəd ümumi sinfin fənn üzrə mənimsəmə səviyyəsini təyin etməkdir. Fərdi sorğular isə ayrı-ayrı şagirdlərin tarix fənn kurikulumu üzrə nəticəsini müəyyən etməyə imkan yaradır. Yazılı tapşırıqlar çoxşaxəliliyi ilə fərqlənir. Bunlara yaradıcı tipli tapşırıqları, layihələri, esseləri, yazılı təqdimatları və s. misal göstərmək olar. Kollektiv iş fəal təlimin ən kütləvi formasıdır və şagirdlərin birgə əməyinin nəticəsidir. Adətən hər hansı tarixi hadisə və prosesə ümumi rəy bildirmək lazım gəldikdə daha çox müraciət olunur. Qruplarla iş hər hansı tədqiqat tapşırıqlarının əməkdaşlıq şəraitində yerinə yetirilməsində faydalıdır.

Tarix təlimindən şagirdlərin biliklərinin yoxlanılması məqsədə müvafiq olmalıdır. Tanınmış professor M.Əmirov tarixin tədrisinin aktual məsələlərindən bəhs edərkən yeni biliklərin yoxlanılması və qiymətləndirilməsində səmərəli metodlardan biri olan kartoçkalardan istifadənin əhəmiyyətini qeyd etmişdir. Müəllim kartoçkaları tərtib edərkən tarixi materialın əsas məzmununun sual və tapşırıqlarda əks olunmasına xüsusilə diqqət etməlidir. Tapşırıqlar məqsəddən asılı olaraq, yazılı və şifahi ola bilər [4, s.71-72]. Qeyd edək ki, qabaqcıl müəllimlər fəal təlim prosesində bu priyomdan məharətlə istifadə edərək şagirdlərin tarixi proseslər və qanunauyğunluqları haqqında biliklərinin səviyyəsini qiymətləndirirlər.

Yazı lövhəsində bir neçə şagirdin eyni zamanda tapşırıqları müstəqil həll etməsi qısa zaman ərzində onların qiymətləndirilməsinə imkan verir. Bu zaman şagirdlərdə aktivlik, rəqabətlik kimi keyfiyyətlər formalaşır. Xəritə və mənbələrlə iş tarixi biliklərin əsasını təşkil edir. Tarix təliminin nəticələrinin qiymətləndirilməsində bu vasitələrin mühüm əhəmiyyəti var. Fəal təlimdə əsas qiymətləndirmə vasitələrindən olan test tapşırıqlarına müəllimlər daha çox üstünlük verirlər. N.Məmmədova testi şagirdlərin bilik və bacarıqlarının üzə çıxarılması vasitəsi kimi qəbul edərək, onu təhsilin ayrılmaz hissəsi hesab etmişdir. O, qeyd edir ki, şagirdlərin bilik və bacarıqlarını aşkara çıxaran anlayış “yoxlama”dır. Elə “test” ingilis sözü olub, “sınaq” və “yoxlamaq” mənasını ifadə edir [12, s.3]. Testlər şagird nailiyyətlərinin yoxlanılmasının yeni üsulu olub, ilk dəfə XIX əsrin sonunda yaranmışdır. Şagirdlərin bilikləri nə dərəcədə mənimsədiyini müəyyənləşdirən testlər XX əsrin 20-ci illərində ingilis dilli ölkələrdə geniş yayılmışdır. Azərbaycanda isə ilk dəfə test sisteminin tətbiqi 1992-ci ildə olmuşdur [11, s.287].

Testlərin qiymətləndirmə vasitəsi kimi əhəmiyyəti, onların obyektivliyindədir, yəni bu nümunələr müəllimlərdən asılı deyil, çünki konkret cavabları vardır. Testlərdən istifadənin tarix

təlimində əhəmiyyəti böyükdür. Tarix təlimi nəticələrinin yoxlanılmasında ən optimal üsul məhz testdir. Testlər məqsədlərdən və təlim formalarından asılı olaraq fərqlənirlər:

- fakt, anlayış, qanun və nəzəriyyələr haqqında bilikləri təcəssüm etdirən testlər;
- bacarıqları yoxlayan testlər;
- mənimsənilən biliklərə tənqidi yanaşaraq, qiymət vermək bacarıqlarını yoxlayan testlər;
- yeni konkret situasiyaları həll etmək bacarıqlarını yoxlamağı nəzərdə tutan testlər [11, s.287].

Şagirdlərin mənimsəmə fəaliyyətini qiymətləndirmədən əvvəl aparılan pedaqoji nəzarət etmə prosesi, onların çətin situasiyalardan çıxmasında, onlara istiqamət verməkdə, dərslərdən sonra zəif nəticə göstərən şagirdlərlə fərdi şəkildə məşğul olmağa imkan verir [8, s.450]. Nəzarət və yoxlama zamanı şagirdlərin bilikləri, bacarıqları, həmçinin onların tapşırıqları yerinə yetirmək üçün sərf etdikləri əməkləri də nəzərdə tutularaq, nəticələrə birbaşa təsir edərək qiymətləndirilmə aparılır.

Testlə sorğu şagirdlərin biliklərinin qiymətləndirilməsinin mütərəqqi üsulu olub nəinki Azərbaycan təhsil sistemində, habelə dünyanın ən inkişaf etmiş ölkələrində bir nömrəli qiymətləndirmə texnologiyasıdır. Son dövrlərin test tapşırıqlarına nəzər salarkən 2 tipdə: açıq və qapalı test nümunələrinə yer verildiyinin şahidi oluruq. Belə ki, adətən qapalı sualların öhdəsindən əksər şagirdlər gələ bildiyi halda, açıq tipli test nümunələrini əsasən daha istedadlı şagirdlərin yerinə yetirdiyini müşahidə edirik. Səbəb odur ki, burada verilən tapşırıqlar cavabsız olduğundan həll edilmə üçün vaxt tələb olunur və şagird çalışaraq aldığı nəticəyə həm də sonda inanmalıdır. Təəssüf ki, əqidəsi zəif şagirdlər hər halda özlərinə bir çox vaxtlarda inanmırlar. Bir çox metodistlərin fikirlərinə görə, test texnologiyasının üstünlükləri ilə yanaşı nöqsanları da vardır. Ölkəmizdə test üsulunun tətbiqindən 20 ildən artıq bir vaxt keçməsinə baxmayaraq, qeyri-standart və mübahisə doğuran test nümunələrinə bu gün də, rast gəlmək mümkündür. Ona görə də, testləri, bu texnologiyaya yaxşı bələd olan insanlar tərtib etməlidir. Digər bir mənfəət kimi, onun şagird nitqinin inkişafına əngəl olduğunu, əzbərcilik kimi vərdişin formalaşmasına gətirib çıxardığını demək olar.

Tarixin tədrisi metodikasının problemlərini bütöv şəkildə tədqiq edən Azərbaycan təhsil məkanında öz sözünü demiş elm adamı Mübariz Əmirov da, test üsulu, onun əhəmiyyəti haqqında dəyərli fikirlər söyləmişdir. Test üsulu nəinki güclü şagirdlərlə, həmçinin orta və zəif şagirdlərlə işləməyə əlverişli şərait yaradır. Mütəxəssisin dediyinə görə, şagirdlərə tarix təlimi zamanı test tapşırıqları tərtib olunarkən aşağıdakı amillər əsas tutulmalıdır:

- terminoloji (anlayışların mahiyyəti açıqlanır, onunla bağlı tapşırıqlar verilir);
- faktlarla əlaqəli (faktlar haqqında məlumatlar əks olunur);
- ümumiləşdirici (hadisələri müəyyənləşdirdikdən sonra ümumiləşdirmə aparılır);
- izahlı (hadisələrin səbəb və məqsədləri haqqında məlumatlar əks olunur);
- hesabi, xronoloji, statistik xarakterli;
- proqnozverici (faktlar və hadisələr haqqında gələcək inkişaf istiqamətlərini müəyyən edir);
- fəaliyyət istiqamətli testlər [5, s.603].

Fənn kurikulumlarında mövzu və bölmələri əhatə edən testlər tərtib edilərkən müxtəlif səpkili, çoxçeşidli nümunələrə, yaradıcı tipli tapşırıqlara, məntiqi və tənqidi tənqidi inkişaf etdirən tapşırıqlara daha çox yer verildiyini müşahidə edirik. Test nümunələri hazırlanarkən, tərtibçi laqeydlikdən baş verən səhv cavablara görə məsuliyyətli olmalıdır. M.Əmirova görə bu, təqsirsizlik prezumpsiyasıdır ki, şagirdlər seçdiyi cavabın düz olduğunu sübut etməyə borclu deyil. Burada testi tərtib edən şəxs əgər səhvə yol veribsə, onu elmi əsasla sübut etməlidir [5, s.605].

Tarix təlimi prosesində müəllimin əsas fəaliyyət istiqamətini təşkil edən şagirdlərin öyrənmə bacarıqlarının qiymətləndirilməsi, onların əldə etdiyi nailiyyətlərini diaqnostlaşdırmaq xarakteri daşıyır [13, s.133].

Tarix təlimi üzrə biliklərin yoxlanılması və qiymətləndirilməsinin xarakteri tarixin tərkib elementləri ilə müəyyən olunur. Tarix təlimində şagirdlərin tarixi hazırlığının komponentləri iki yerə ayrılır: a) obyektiv; b) subyektiv.

Tarix təliminin nəticələrinin qiymətləndirilməsində şagirdlərin obyektiv gerçəklikləri dərk etmələrinin və onların tarixi proseslərə şəxsi münasibətləri ilə əlaqədar olaraq, subyektivizmin əlamətləri müşahidə olunur. Bunların şagirdlərin əqli düşüncəsinin inkişafında və müstəqil fikir irəli sürməsində böyük əhəmiyyəti vardır. Tarix təliminin obyektiv göstəricilərinə: tarixi il, günlərin düzgün qeyd olunması; tarixdə əvvəllər baş vermiş hadisələri sonrakı hadisələrlə əlaqələndirmək; hadisələri xronoloji sxemdə qurmaq; hadisələri müqayisə etmək, onların içindən ümumi və xüsusiyyətləri aid etmək.

Bəzən elə hallar müşahidə olunur ki, şagirdlər tarixi hadisələrə öz mövqeyindən yanaşaraq, birmənalı münasibət bildirirlər. Məktəblilər müxtəlif tarixi ədəbiyyat və mənbələrdən istifadə edərək fərqli mövqelərdən çıxış edirlər. Şagirdlərin qiymətləndirilməsində onların tarix təlimində əldə etdiyi biliklərə subyektiv düşüncə tərzindən yanaşmaları, müstəqil mühakimə yürütmələri kimi faktorlar böyük əhəmiyyət kəsb edir. Şagirdlərin tarixi biliklərinin subyektiv xüsusiyyətləri aşağıdakı kimi səciyyələndirilir:

- tarixi hadisələr və onların xarakteristikası üçün lazımi materialın ayırd edilməsində;
- tarixi hadisələrin rolunun təsnif edilməsi, habelə qiymətləndirilməsinə dair istifadə olunan qiymət göstəricilərinə;
- ümumiləşdirmələr aparılmasında və yekun nəticələrin çıxarılmasında.

Tarix təlimində şagirdlərin təlim nəticələrini qiymətləndirən zaman şəffaflıq, şərhin tam olması əhəmiyyətlidir. Qiymətləndirmə aparılarkən dərslük materialı çərçivəsini əhatə edən tapşırıqlar verilməli və həmçinin də, əsas tarixi mənbəyə istinad edilməklə tarixi materiallardan istifadə olunması zəruridir. Belə olduqda, yoxlama və yaxud qiymətləndirmə prosesi komissiya tərəfindən (bir çox hallarda ekspert qrupu tərəfindən) həyata keçirilir. Tarix təlimində biliklərin yoxlanılması zamanı cari, tematik, yekun: bütün yoxlama növlərindən istifadə olunur. Bu prinsiplər tarix fənnindən hazırlanmış testlərə də şamil olunur.

Tarix fənnini digər fənlərdən fərqləndirən cəhət öz obyektini müntəzəm olaraq dəyişilməsi, yeniləşməsi, formalaşma və təkmilləşməsi ilə bağlıdır. Belə olduğu təqdirdə, idraki qabiliyyətlərə verilən tələblərin spesifik cəhətləri yaranır. Məsələn: tarixi mənbədə verilən informasiyanın tənqidi mənimsənilməsi, hadisələrin gedişatının təsəvvürü, tarixi şəraitdə insanların əks tərəfə qarşı apardığı mübarizənin ümumilikdə tarixi proseslərə və hadisələrə öz mövqeyini bildirərək əsaslandırması və s.

Tarix təlimində şagirdlərin müvəffəqiyyət əldə etməsində onların müəllimləri, özləri, valideynləri eləcə də, məktəb rəhbərləri əsas maraqlı tərəflərdir. Qiymətin və qiymətləndirmənin rolu, əhəmiyyəti həmişə pedaqoji proses iştirakçılarının nəzərində aparıcı mövqe tutmuşdur. Fənn kurikulumlarında şagirdlərin bilik və bacarıqları məzmun standartlarına əsasən qiymətləndirilir. Belə ki, məktəblilərin bilik, bacarıqlarının qiymətləndirilməsi prosesi, didaktikada mövzunun mənimsəmə səviyyəsinin tədris proqramlarında göstərilən meyarlarla müqayisə edilərək dərk olunmasına əsasən aparılır. Qiymətləndirmə indikatorları isə şagirdlərin düzgün qiymətinin çıxarılmasında müəllimə kömək edir [10, s.298].

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QADINLAR MÖVZUSU

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Xülasə. Qadınlar, insan cəmiyyətinin ən mühüm tərkib hissələrindən biri olmaqla yanaşı, tarix boyu həm sosial, həm də mədəni inkişafın təməlini təşkil etmişlər. Əsrlər boyu cəmiyyətlər qadınları çox vaxt ikinci dərəcəli varlıqlar olaraq qəbul etmiş, onların hüquqlarını və imkanlarını məhdudlaşdırmışdır. Lakin bu, qadınların gücünü, bacarıqlarını və dəyişiklik yarada bilmə potensialını heç vaxt tamamilə boğmamışdır. Qadınlar öz mübarizələrini davam etdirərək, müxtəlif dövrlərdə iqtisadi, sosial, siyasi və mədəni sahələrdə mühüm nailiyyətlər əldə ediblər.

Bütün bunlarla yanaşı, qadınların həyatdakı rolu daim inkişaf edən, dəyişən və yeniliklərə uyğunlaşan bir mövzu olmuşdur. XIX və XX əsrlərdə qadınların hüquqları və yerinə dair ciddi mübahisələr baş vermiş, xüsusən də təhsil, seçki hüququ, əmək bazarına qatılma kimi sahələrdə daha bərabər imkanlar əldə etmək üçün fəal hərəkətlər başlamışdır. Həmin dövrlərdə yaranan qadın hüquqları hərəkatı, o cümlədən suffraget hərəkatı və feminist inqilablar, qadınların cəmiyyətdəki rolunun dəyişməsində və cinsiyyət bərabərliyinin təmin olunmasında əhəmiyyətli bir dönəm yaratmışdır.

Bugünkü müasir dünyada isə qadınlar yalnız ailə həyatında və ev təsərrüfatında deyil, həm də sosial, siyasi, iqtisadi və elm sahələrində çox önəmli mövqelərdə təmsil olunur. Lakin, hələ də bir çox sahədə gender bərabərsizliyi və qadınların qarşılaşdığı təzyiqlər davam edir. Cinsiyyətə əsaslanan diskriminasiya, əmək haqqı fərqləri, siyasət və idarəetmədə qadınların az təmsil olunması və digər bərabərsizliklər, qadınların bütün potensialını reallaşdırmasının qarşısını alır.

Açar sözlər: *Qadın, cəmiyyət, hüquq, inkişaf, feminist, müasir, cinsiyyət, diskriminasiya, əmək*

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WOMEN'S TOPIC

Summary. Women, in addition to being one of the most important components of human society, have formed the basis of both social and cultural development throughout history. For centuries, societies have often considered women as secondary beings and limited their rights and opportunities. However, this has never completely stifled women's power, skills and potential to create change. Women have continued their struggle and achieved significant achievements in the economic, social, political and cultural fields at different times.

Along with all this, the role of women in life has been a topic that is constantly developing, changing and adapting to innovations. In the 19th and 20th centuries, serious debates took place regarding the rights and place of women, especially in areas such as education, suffrage, and participation in the labor market. The women's rights movement that emerged during those times, including the suffragette movement and feminist revolutions, created a significant era in changing the role of women in society and ensuring gender equality.

In today's modern world, women are represented not only in family life and household, but also in very important positions in social, political, economic and scientific fields. However, gender inequality and the pressures faced by women still persist in many areas. Gender-based discrimination, wage gaps, under-representation of women in politics and management, and other inequalities prevent women from realizing their full potential.

Keywords: *Women, society, law, development, feminist, modern, gender, discrimination, labor*

Aktuallıq: Qadınlar, tarix boyu müxtəlif mədəniyyətlərdə fərqli şəkildə qəbul edilmiş və tərif edilmişdir. Qədim dövrlərdə qadınlar çox vaxt ailə içindəki əsas qayğıkeşlər və uşaqların tərbiyəçiləri kimi tanınırdılar. Lakin zamanla qadınların təhsil alması, cəmiyyətdə fəal iştirakı və iş dünyasında yer alması inkişaf etdi.



Qədim dövrün qadınları: Antik Yunan və Roma dövrlərində qadınlar cəmiyyətin müəyyən hissələrində məhdud hüquqlara sahib idilər. Lakin, misal olaraq, qadın filosof və yazıçı Hypatia, qadınların elm sahəsində də söz sahibi olmasına öncülük etmişdir.

Orta əsrlər və Rəngli İslami Dönəm: Orta əsrlərdə, xüsusilə Avropada, qadınlar çox vaxt evdə qalır və təhsil almaq, işləmək kimi hüquqlardan məhrum edilirdilər. Lakin İslam dünyasında qadınların hüquqları fərqli bir şəkildə tənzimlənmiş və onların təhsil alması, iqtisadi sahədə iştirak etmələri təşviq edilmişdir. Məsələn, 10-cu əsrdə yaşadığı deyilən qadın alimlər arasında Fatimə al-Fihri kimi önəmli şəxsiyyətlər olmuşdur.



Qadınların bərabər hüquqlarını tələb edən hərəkət, 19-cu və 20-cu əsrlərdə daha çox yayılmağa başlamışdır. Avropa və Şimali Amerikada qadın hüquqları hərəkəti genişlənmiş, qadınların seçki hüquqları, təhsil, iş dünyasında iştirak etmə hüquqları üçün mübarizə aparılmışdır.

Suffraget Hərəkəti: 19-cu əsrin sonları və 20-ci əsrin əvvəllərində qadınların seçki hüququnu tələb edən hərəkətin ən məşhur nümunəsi İngiltərədəki suffraget hərəkətidir. 1920-ci ildə ABŞ-da

qadınlara seçki hüququ verildi. Bu, dünyadakı qadın hüquqları hərəkatının ən böyük nailiyyətlərindən biriydi.

Feminist Hərəkatı: 20-ci əsrin ikinci yarısında feminist hərəkatının yüksəlişi, qadınların iş yerində bərabər əmək haqqı, uşaqlıq hüquqları və cinsi zorakılığa qarşı mübarizədə daha fəal olmalarına səbəb olmuşdur. Bu dövrün fəal liderlərindən biri Simone de Beauvoir idi ki, o, "İkinci Cins" adlı əsərində qadınların cəmiyyətdəki yerinə dair dərin analizlər təqdim etmişdir.



Bugünkü gündə qadınlar cəmiyyətin müxtəlif sahələrində, xüsusilə siyasət, elm, incəsənət və biznesdə əhəmiyyətli rollar oynayır. Artıq qadınlar bir çox ölkədə dövlət başçısı, nazir, alim, sənətçi və digər peşələrdə təmsil olunurlar. Amma bərabərsizliyin hələ də mövcud olduğu sahələr var.

Qadınlar və Təhsil: Müasir dövrdə qadınların təhsil alması, bərabər hüquqlar əldə etməsi sosial-iqtisadi inkişafa gətirib çıxarır. Bir çox inkişaf etmiş ölkələrdə qadınlar daha çox təhsil alır və işləyirlər, ancaq inkişaf etməkdə olan ölkələrdə təhsil sahəsində gender bərabərsizliyi davam edir.

Qadınlar və İş Dünyası: Qadınlar iş dünyasında daha çox iştirak etməyə başlasa da, gender bərabərsizliyi hələ də mövcuddur. Qadınların eyni işdə daha aşağı maaş almaları, rəhbər mövqelərdə daha az yer tutmaları kimi problemlər davam edir.

Cinsiyyət Bərabərliyi: Bütün dünyada qadınların hüquqlarının tanınması və bərabərliyi üçün bir çox təşkilat və hökumətlər mübarizə aparır. UN Women kimi beynəlxalq təşkilatlar, cinsiyyət bərabərliyinin təmin edilməsi və qadınların iqtisadi, sosial və siyasi həyatda daha fəal rol alması üçün geniş tədbirlər görürlər.



Qadınların ailə içindəki rolu çox vaxt emosional dəstək, uşaq tərbiyəsi və ev işləri ilə əlaqələndirilir. Lakin, müasir dövrdə qadınların karyera qurması və ailə həyatını balanslaşdırması daha çox qarşıya çıxan mövzulardan biridir.

Əməkdaşlıq və İctimai Dəstək: Kişilərlə qadınlar arasında iş bölgüsündə bərabərlik daha çox təbliğ olunmağa başlanmışdır. Bu, xüsusilə ailə işlərinin paylaşılması, ev işlərində dəstək və uşaqların tərbiyəsində valideynlər arasında bərabər məsuliyyətin bölüşdürülməsi ilə özünü göstərir.



Sosial media, qadınların öz fikir və təcrübələrini bölüşmələri üçün yeni imkanlar yaratmışdır. Onlar, cinsiyət bərabərsizliyi, qadın hüquqları, əqli sağlamlıq və digər məsələlər haqqında dünyada səslərini duyurmağa başlamışlar.

Məsələn, **#MeToo** hərəkatı, qadınların cinsi zorakılığa qarşı birləşərək güclü bir səsyüksəltdilər. Bu hərəkat dünya miqyasında qadınların haqlarını müdafiə etmək və cinsi zorakılığa qarşı çıxmaq üçün mühüm bir addım oldu.



Qadınların gələcəyini daha parlaq görmək mümkündür. Təhsil, texnologiya, təbiət elmləri, və digər sahələrdə qadınların iştirakı artır. Gələcəkdə daha çox qadın liderlər, alimlər, artistlər və aktivistlər cəmiyyətin inkişafına töhfə verəcəklər.

Lakin, qadınların qarşılaşdıqları gender bərabərsizliyi, iqtisadi çətinliklər, və sosial təzyiqlər hələ də mövcud olan məsələlərdir. Bu məsələlərin həlli, bütün cəmiyyətin iştirakı və kollektiv iradəsi ilə mümkündür.

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