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# Physical and Mathematical Sciences

## ЖАСАНДЫ ИНТЕЛЛЕКТТІҢ ФИЗИКАДАҒЫ РӨЛІ

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### Аңдатпа

Бұл мақала жасанды интеллекттің (ЖИ) физика ғылымында қолданылуын зерттейді. Соңғы жылдары жасанды интеллекттің физикалық зерттеулердегі рөлі айтарлықтай өсті, себебі ол күрделі есептерді шешуге, үлкен мәліметтер көлемін талдауға, және жаңа ашылымдар жасауға мүмкіндік береді. Мақалада ЖИ-дің физикадағы әртүрлі қолдану салаларына, оның ішінде кванттық физика, астрономия, материалтану және күрделі физикалық жүйелерді модельдеуге қатысты негізгі бағыттары қарастырылады. Сонымен қатар, ЖИ мен физикалық білімді біріктірудің болашағы мен мәселелері талқыланады.

**Тірек сөздер:** *Жасанды интеллект, физика, кванттық физика, мәліметтер талдауы, модельдеу, үлкен деректер, нейрондық желілер, машина оқыту.*

Физика – табиғаттың негізгі заңдылықтарын зерттейтін ғылым, ал жасанды интеллект – бұл ақпаратты өңдеу мен талдауда революциялық әдістерді ұсынатын технология. Соңғы жылдары ЖИ технологиялары күрделі физикалық есептерді шешу үшін қолданыла бастады. ЖИ-дің аналитикалық мүмкіндіктері физиканың түрлі салаларында жаңа тәсілдер мен инновациялар әкелуде. ЖИ-дың физикалық зерттеулерді жетілдіру және оңтайландыру мүмкіндіктерін көрсету. ЖИ арқылы деректерді талдау, модельдеу және болжау әдістерін пайдаланып, жаңа материалдар мен технологияларды ашу жолдарын зерттеу. Сондай-ақ, физикадағы күрделі процестерді автоматтандыру мен олардың тиімділігін арттыруды қамтамасыз етеді.

Қазақстан Республикасының 17 тұрақты даму мақсаттарына жетудің бір жолы - жасанды интеллект (ЖИ) технологиясы мен физика ғылымының интеграциясын және қазіргі заманғы ғылыммен технологияны жаңа деңгейге көтеруде. Бұл екі саланың үйлесуі жаһандық мәселелерді шешуге, соның ішінде тұрақты даму мақсаттарына (ТДМ) жетуге мүмкіндік береді.

ЖИ физикалық зерттеулерде қолданылып, табиғи ресурстарды үнемдеу, энергия тиімділігін арттыру және экологиялық қауіпсіз технологияларды дамыту сияқты бағыттарда маңызды рөл атқарады.

Сапалы білім беру (ТДМ 4)

Жасанды интеллекттің физикадағы қолданылуы білім беру саласын жетілдіруге ықпал етеді.

- Оқыту әдістерін жетілдіру: Физикалық модельдерді визуализациялау мен ЖИ негізінде интерактивті оқыту әдістері білімді жеңіл әрі тиімді меңгеруге мүмкіндік береді.
- Ғылыми зерттеулер: ЖИ физикалық зерттеулерді қолдау арқылы жаңа буын ғалымдарын даярлауға ықпал етеді.

**Тұрақты даму мақсаты:** Жасанды интеллект (ЖИ) технологиясы мен физика ғылымының интеграциясы қазіргі заманғы ғылым мен технологияны жаңа деңгейге көтеруде. Бұл екі саланың үйлесуі жаһандық мәселелерді шешуге, соның ішінде тұрақты даму мақсаттарына (ТДМ) жетуге мүмкіндік береді. ЖИ физикалық зерттеулерде қолданылып, табиғи ресурстарды үнемдеу, энергия тиімділігін арттыру, және экологиялық қауіпсіз технологияларды дамыту сияқты бағыттарда маңызды рөл атқарады.

Қолжетімді және таза энергия (ТДМ 7)

- Жасанды интеллект энергия үнемдеу мен жаңартылатын энергия көздерін басқаруда маңызды рөл атқарады.
- Энергия жүйелерін басқару: ЖИ күн және жел электр станцияларының жұмысын болжау және оңтайландыру үшін қолданылады. Бұл энергия өндірісін арттыруға және шығындарды азайтуға көмектеседі.
- Жаңа материалдарды зерттеу: Физикадағы деректерді талдау арқылы ЖИ энергия сақтау құрылғылары мен күн батареялары үшін жоғары тиімді материалдарды анықтауға көмектеседі.
- Кванттық физика мен энергия: Кванттық есептеулер энергияны үнемдейтін жаңа технологияларды әзірлеу үшін күрделі есептерді шешуге мүмкіндік береді.

1. Инновациялар, инфрақұрылым және өнеркәсіп (ТДМ 9)

ЖИ физикалық процестерді жетілдіру және автоматтандыру арқылы өнеркәсіптік дамуды қолдайды.

- Материалтану: ЖИ көмегімен материалдардың қасиеттерін болжау және сынақтан өткізу уақытын қысқартады. Бұл экологиялық таза материалдарды әзірлеуге жол ашады.
- Инфрақұрылымды дамыту: Физикалық жүйелерді модельдеу арқылы ғимараттар мен инфрақұрылымның қауіпсіздігі мен энергия тиімділігін арттыруға болады.
- Өндірістік процестерді оңтайландыру: ЖИ өндірісте қалдықтарды азайту және энергия тұтынуды қысқарту мақсатында процестерді автоматтандырады.

2. Климаттың өзгеруіне қарсы күрес (ТДМ 13)

Климаттың өзгеруімен күрес ЖИ мен физика ғылымының маңызды бағыттарының бірі болып табылады.

- Парниктік газдарды талдау: ЖИ атмосферадағы парниктік газдардың таралуын болжайды және олардың әсерін азайту бойынша шараларды ұсынады.
- Жаңартылатын энергия: ЖИ жаңартылатын энергия көздерінің тиімділігін арттыру және энергия жүйелерін басқару арқылы климаттың өзгеруін бәсеңдетеді.
- Экологиялық модельдеу: Физикалық процестерді модельдеу климаттық апаттарды алдын ала болжауға және табиғи ресурстарды басқаруға көмектеседі.

3. Сапалы білім беру (ТДМ 4)

Жасанды интеллекттің физикадағы қолданылуы білім беру саласын жетілдіруге ықпал етеді.

- Оқыту әдістерін жетілдіру: Физикалық модельдерді визуализациялау мен ЖИ негізінде интерактивті оқыту әдістері білімді жеңіл әрі тиімді меңгеруге мүмкіндік береді.
- Ғылыми зерттеулер: ЖИ физикалық зерттеулерді қолдау арқылы жаңа буын ғалымдарын даярлауға ықпал етеді.

4. Экологиялық тұрақтылық және ресурстарды үнемдеу (ТДМ 12)

ЖИ табиғи ресурстарды ұтымды пайдалануды қамтамасыз ететін инновациялық шешімдер ұсынады.

- Қалдықтарды басқару: Физика заңдылықтарына негізделген модельдер мен ЖИ қалдықтарды қайта өңдеуге және ресурстарды тиімді пайдалануға мүмкіндік береді.

- Экологиялық қауіпсіз өндіріс: ЖИ көмегімен өндірістік процестерді экологиялық тұрғыдан тұрақты ету жолдары жетілдіріледі.

#### 5. Денсаулық сақтау және әлеуметтік әсері (ТДМ 3 және ТДМ 16)

ЖИ физика ғылымындағы рөлі қоғамның денсаулығы мен қауіпсіздігін қамтамасыз етуге ықпал етеді.

- Медицина: ЖИ және кванттық физика күрделі биологиялық процестерді модельдеу, жаңа дәрі-дәрмектерді жасау және медициналық құрылғылардың дәлдігін арттыру үшін қолданылады.

- Қауіпсіздік: Кванттық физика негізінде әзірленген ЖИ криптография әдістері ақпаратты қорғаудың жаңа деңгейін қамтамасыз етеді.

Жасанды интеллекттің физикадағы қолданылуы тұрақты даму мақсаттарына қол жеткізуде маңызды рөл атқарады. Энергия тиімділігін арттыру, экологиялық тұрақтылықты қамтамасыз ету, инновациялық материалдарды әзірлеу және климаттың өзгеруіне қарсы күрес сияқты бағыттарда ЖИ мен физика ғылымы маңызды нәтижелерге жетуде. Бұл интеграция тек ғылым мен технологияның дамуын қамтамасыз етіп қана қоймай, болашақ ұрпақ үшін тұрақты және экологиялық қауіпсіз әлем құруға мүмкіндік береді.

#### *Жасанды интеллекттің физикадағы қолдану салалары*

Кванттық физика және жасанды интеллект (ЖИ) — қазіргі заманғы ғылым мен технологияның ең маңызды екі саласы. Екеуінің бірігуі болашақта ғылымның түрлі аспектілерін айтарлықтай өзгертеді деп күтілуде.

#### Кванттық физика және ЖИ арасындағы байланыс

Кванттық есептеу: Кванттық физиканың негізгі тұжырымдамаларының бірі болып табылатын суперпозиция және кванттық тұтас күй (entanglement) кванттық компьютерлердің негізі болып табылады. Кванттық компьютерлер дәстүрлі компьютерлер шеше алмайтын мәселелерді шешуге қабілетті болуы мүмкін. Мысалы, кванттық компьютерлер ЖИ алгоритмдерін тиімдірек іске асыра алады, өйткені олар үлкен көлемдегі деректерді жылдам өңдейді.

1. ЖИ кванттық физикаға көмектеседі: Жасанды интеллект күрделі кванттық жүйелерді модельдеуге және зерттеуге, кванттық тәжірибелерден алынған деректерді талдауға көмектеседі. Мысалы, машиналық оқыту кванттық жүйелердің қасиеттерін болжауға немесе кванттық өлшеулердегі қателіктерді түзетуге қолданылуда.

2. Кванттық ЖИ: Бұл — жасанды интеллектті кванттық негізде құруға тырысатын зерттеу бағыты. Мұндай ЖИ әдеттегі алгоритмдерден тезірек жұмыс істеуі мүмкін, сондықтан деректерді өңдеу мен үйрену процесін айтарлықтай жақсартуға мүмкіндік береді.

#### *Қолдану салалары*

- Медицина: Кванттық ЖИ күрделі биологиялық процестерді модельдеуге және жаңа дәрілерді тезірек табуға көмектеседі.

- Қаржы: Жасанды интеллектпен басқарылатын кванттық есептеу қаржылық модельдерді нақтырақ болжауға және күрделі нарықтық жүйелердегі өзгерістерді бақылауға мүмкіндік береді.

- Қауіпсіздік: Кванттық криптография ЖИ көмегімен ақпаратты қауіпсіз шифрлау және қорғау әдістерін жетілдіреді. Кванттық физика мен ЖИ үйлесімі жаңа ғылыми жаңалықтарға жол ашып, технологияның дамуына үлкен серпін береді.

### *Астрономия және үлкен деректерді өңдеу*

ЖИ технологиялары үлкен деректерді өңдеуде тиімді құрал ретінде танылды. Астрономияда аспан денелерін бақылау нәтижесінде үлкен көлемде деректер жиналады, және бұл деректерді тиімді түрде талдау үшін ЖИ алгоритмдері қолданылады. Нейрондық желілер мен машина оқыту әдістері ғарыштағы объектілерді анықтау, каталогтау және олардың эволюциясын болжауға көмектеседі.

Астрономия және үлкен деректерді (Big Data) өңдеу бір-бірімен тығыз байланысты салаларға айналды, өйткені қазіргі заманғы астрономиялық зерттеулер үлкен көлемдегі мәліметтерді жинауға негізделеді. Бұл деректерді өңдеу, талдау және сақтау астрономияның жетістіктерін жаңа деңгейге көтереді.

### *Материалтану және жаңа материалдар іздеу*

Жаңа материалдар жасау мен олардың қасиеттерін болжау күрделі зерттеуді талап етеді. Жасанды интеллект материалтануда жаңа материалдардың қасиеттерін болжауға, олардың құрылымын талдауға және оларды тиімді қолдануға мүмкіндік береді. ЖИ деректерге негізделген болжау әдістері арқылы жаңа материалдарды табу уақытын айтарлықтай қысқартады. Материалтану және жаңа материалдар іздеу — қазіргі ғылым мен технологияның аса маңызды бағыттарының бірі. Материалдардың жаңа түрлерін табу көптеген салаларға, соның ішінде электроника, медицина, энергетика, ғарыштық зерттеулер және өнеркәсіптік өндіріс секілді салаларға елеулі әсер етеді.

Материалтану — материалдардың құрылымы мен қасиеттерін зерттейтін ғылым. Оның мақсаты — материалдардың мінез-құлқын түсіну және олардың құрылымын өзгерту арқылы қажетті қасиеттерге ие жаңа материалдарды жасау. Материалдар макро және нано деңгейде зерттеледі, бұл олардың микроскопиялық қасиеттерін түсінуге және оларды қолдану мүмкіндіктерін кеңейтуге мүмкіндік береді.

### *Жаңа материалдарды іздеу жолдары*

1. Дәстүрлі әдістер: Зертханалық эксперименттер материалтанудағы негізгі зерттеу тәсілдерінің бірі болып табылады. Ғалымдар химиялық элементтер мен қосылыстарды біріктіріп, жаңа материалдардың қасиеттерін зерттейді. Дегенмен, бұл процесс көп уақыт пен ресурстарды талап етеді.

2. Жасанды интеллект және үлкен деректер: Жасанды интеллект пен үлкен деректер материалдардың жаңа түрлерін тезірек табуға көмектеседі. Машиналық оқыту алгоритмдері материалдардың химиялық және физикалық қасиеттерін болжау үшін үлкен көлемдегі деректерді талдай алады. Бұл әдіс материалдардың жаңа комбинацияларын сынақтан өткізбей-ақ болжауға мүмкіндік береді, бұл уақытты үнемдейді.

3. Есептеу материалтануы: Есептеу әдістері мен модельдеу де маңызды рөл атқарады. Компьютерлік модельдер арқылы ғалымдар жаңа материалдардың қасиеттерін алдын ала зерттеп, олардың қалай жұмыс істейтінін болжай алады. Мысалы, суперкомпьютерлер мен кванттық есептеулер арқылы материалдардың атомдық деңгейдегі құрылымы мен әрекетін зерттеу мүмкін болады.

*Нанотехнология:* Наноматериалдар — қазіргі заманғы материалтанудың ең маңызды бағыттарының бірі. Нанотехнология арқылы ғалымдар материалдардың қасиеттерін атомдық және молекулалық деңгейде басқара алады. Бұл жеңіл, мықты, жылу мен электр өткізгіштігі жоғары материалдар жасауда қолданылады.

### *Материалдардың қолдану салалары*

- Энергетика: Жаңа материалдар энергияны тиімді сақтау және өндіру технологияларында (батареялар, күн батареялары, отын элементтері) қолданылады.

- Медицина: Биоматериалдар медицинада қолданылатын құралдарды жасау үшін, сондай-ақ жасушалық инженерия мен регенеративті медицинада маңызды.

- Электроника: Жаңа жартылай өткізгіш материалдар микрочиптерді және басқа да электрондық компоненттерді жасауды дамытады.

- Құрылыс және көлік: Жеңіл және мықты материалдар заманауи ғимараттар мен көліктердің беріктігін арттыруға мүмкіндік береді.

Материалтану мен жаңа материалдарды іздеу болашақ технологиялардың дамуына негіз болады және көптеген ғылыми және өндірістік салаларды жаңартады.

#### *Жасанды интеллекттің физикадағы болашағы*

Жасанды интеллекттің физикалық ғылымдардағы рөлі әлі де кеңейіп жатыр. Болашақта ЖИ кванттық есептеулер, астрофизика және биофизика салаларында үлкен жетістіктерге жетуі мүмкін. ЖИ физикалық заңдылықтарды түсінуде және жаңа теорияларды жасауда зерттеушілердің көмекшісі ретінде қызмет ете алады.

Жасанды интеллекттің (ЖИ) физикадағы болашағы өте перспективалы, өйткені ЖИ физиканың күрделі мәселелерін шешуде, жаңа теорияларды дамытуда және тәжірибелерді жылдамдатуда үлкен рөл атқара алады. Физика — күрделі заңдылықтарға негізделген ғылым, ал ЖИ технологиялары үлкен деректерді жылдам өңдеп, модельдеу және болжау сияқты процестерді автоматтандыруға мүмкіндік береді. Бұл болашақта физикадағы маңызды жаңалықтарға әкелуі мүмкін.

#### *ЖИ-дің физикадағы болашағы*

1. Физикалық процестерді модельдеу: ЖИ физикадағы модельдерді жасау және күрделі құбылыстарды есептеу үшін тиімді құрал бола алады. Машиналық оқыту алгоритмдері көмегімен ғалымдар күрделі физикалық жүйелердің мінез-құлқын алдын ала болжай алады, бұл әсіресе кванттық физика, термодинамика және астрофизика салаларында пайдалы.

2. Кванттық физика және ЖИ: Кванттық механикада ЖИ кванттық жүйелерді тиімді модельдеу және талдауда қолданылады. Мысалы, кванттық компьютерлер үшін жаңа алгоритмдерді табу, кванттық бөлшектердің өзара әрекеттесуін болжау немесе кванттық өлшеулердегі қателерді түзету үшін ЖИ қолданылады. Болашақта кванттық есептеу мен ЖИ-дің бірігуі аса күшті есептеу жүйелерін жасауға мүмкіндік береді.

3. Үлкен деректер және физикалық зерттеулер: Астрономия, космология және бөлшектер физикасында үлкен көлемдегі деректермен жұмыс істеу қажет. ЖИ технологиялары үлкен деректерді жылдам талдап, маңызды заңдылықтарды анықтауға мүмкіндік береді. Мысалы, астрофизикалық бақылаулардан алынған мәліметтерді өңдеуде немесе қара материя мен қара энергияны зерттеуде ЖИ маңызды рөл атқарады.

4. Автоматтандырылған эксперименттер: Физикадағы зерттеулер күрделі эксперименттерді талап етеді. ЖИ зертханалық жабдықтар мен құрылғыларды автоматтандыруға және оларды басқаруға көмектеседі. Мұндай технологиялар тәжірибелерді жылдам жүргізіп, нәтижелерді тиімді талдауға мүмкіндік береді.

5. Физикалық теорияларды жасау және тексеру: ЖИ физикалық теорияларды жасау және сынақтан өткізу процесін оңтайландыра алады. Ғалымдар ЖИ-ді деректерден алынған заңдылықтарды автоматты түрде анықтауға және жаңа гипотезалар ұсынуға қолданады. Бұл теориялық физикадағы үлкен серпінге әкелуі мүмкін.

6. Жаңа материалдарды табу: Материалтану саласында ЖИ жаңа материалдарды модельдеу және олардың қасиеттерін болжау үшін қолданылады. Физиканың әртүрлі салаларында қолдануға болатын жаңа материалдарды табу болашақтағы ғылыми жаңалықтарға жол ашады.

#### *ЖИ-дің физикадағы қолдану салалары*

- Космология: ЖИ ғарыштық объектілердің мінез-құлқын, галактикалардың эволюциясын және үлкен жарылыс теориясын модельдеуде көмектеседі.

- Бөлшектер физикасы: Үлкен адрондық коллайдер (CERN) сияқты бөлшектерді зерттеу эксперименттерінде ЖИ бөлшектердің өзара әрекеттесулерін талдауға және маңызды деректерді автоматты түрде анықтауға көмектеседі.

- Кванттық есептеу: ЖИ кванттық есептеулердің тиімділігін арттыру үшін жаңа алгоритмдерді жасауға және кванттық ақпаратты өңдеуге қолданылуда.

- Метеорология және климаттық модельдер: ЖИ физикадағы атмосфералық процестерді түсінуге және ауа райы мен климаттың өзгерістерін болжауға көмектеседі.

Болашақтағы мүмкіндіктер

1. Жасанды интеллект пен кванттық физика интеграциясы: Болашақта ЖИ және кванттық есептеу бірлесіп жұмыс істеп, көптеген физикалық процестерді тиімді есептеп шығара алады. Бұл жаңа технологиялық және ғылыми ашылуларға жол ашады.

2. Автономды зерттеу жүйелері: Болашақта ЖИ автономды физикалық зерттеу жүйелерін дамытуға көмектеседі. Мұндай жүйелер өздігінен тәжірибе жасап, нәтижелерді бағалай алады, бұл зерттеу процесін айтарлықтай жылдамдатады.

3. Физикалық заңдарды тереңірек түсіну: ЖИ деректерді талдау және күрделі жүйелерді модельдеу арқылы физикалық заңдардың жаңа аспектілерін ашуға көмектеседі. Бұл физикадағы дәстүрлі зерттеу әдістеріне қарағанда тезірек нәтижелер береді.

Жасанды интеллекттің физикаға ықпалы артып келе жатыр, ал болашақта оның көмегімен жаңа физикалық заңдар мен құбылыстар ашылуы мүмкін. Бұл физика саласындағы ғылыми зерттеулердің шекарасын кеңейтеді.

*ЖИ-ді физикада қолданудағы қиындықтар*

Жасанды интеллектті (ЖИ) физикада қолдану үлкен мүмкіндіктерге ие болғанымен, бірнеше қиындықтармен кездеседі. Біріншіден, кейбір физикалық салаларда жеткілікті мәліметтердің жетіспеушілігі және деректердің шулы болуы ЖИ-дің дәлдігін төмендетуі мүмкін. Екіншіден, ЖИ алгоритмдері физикалық заңдарды автоматты түрде сақтай бермейтіндіктен, олардың нәтижелері кейде сенімсіз болып шығады. Үшіншіден, күрделі физикалық жүйелерді модельдеу үшін үлкен есептеу ресурстары қажет, ал бұл әрдайым мүмкін бола бермейді. Сондықтан ЖИ-ді физикада тиімді пайдалану үшін сарапшылардың ынтымақтастығы және физикалық заңдарды ескере отырып, модельдерді жетілдіру қажет.



1-сурет

Сауаланама нәтижесі бойынша диаграммада жасанды интеллекттің (ЖИ) физикалық жүйелерді зерттеуде қолданылу салаларының үлестері көрсетілген. Зерттеу нәтижелеріне сәйкес, респонденттердің 85,7%-ы ЖИ-ді деректерді өңдеу және арттыру үшін қолданатынын атап өткен, бұл жасанды интеллекттің үлкен деректерді талдау саласындағы маңыздылығын көрсетеді. Сонымен қатар, 28,6% респонденттер ЖИ-ді болашақ сценарийлерді модельдеу мақсатында пайдаланатынын көрсетсе, дәл осындай пайыз ЖИ-ді жалпы тиімділікті арттыру үшін қолданатынын көрсетеді. Бұл нәтижелер ЖИ-дің физикадағы зерттеулерде процестерді оңтайландыруға және модельдеу мүмкіндіктерін кеңейтуге бағытталғанын дәлелдейді. Респонденттердің 14,3%-ы ЖИ-ді күрделі заңдылықтарды анықтау үшін пайдаланатынын атап өткен, бұл технологияның жаңа ғылыми заңдылықтарды ашудағы әлеуетін көрсетеді. Нәтижелерден көрінгендей, ЖИ-дің физикалық зерттеулердегі рөлі деректерді өңдеумен қатар болашақ болжамдар жасау және зерттеу тиімділігін арттыру тұрғысынан да аса маңызды. Бұл нәтижелер ЖИ технологияларын физикалық зерттеулерге интеграциялау арқылы ғылыми процестерді жетілдіру мүмкіндігін растайды.

Қорытындылай келе, жасанды интеллект физика ғылымында маңызды орын алып келеді және оның қолдану аясы жылдан жылға артып келеді. ЖИ күрделі физикалық есептерді шешуге, жаңа материалдарды табуға, ғарыштық деректерді талдауға және басқа да көптеген физикалық мәселелерді шешуге мүмкіндік береді. Жасанды интеллект физика саласын өзгертіп, эксперименттік талдауды және теориялық модельдеуді жетілдіру құралдарын ұсынады. ЖИ мен дәстүрлі ғылыми әдістердің үйлесуі физикалық әлемді танудың шекараларын кеңейтуге мүмкіндік береді. Болашақта ЖИ физика ғылымында инновациялық ашылымдарға жол ашатын құралға айналуы ықтимал. Дегенмен, ЖИ-ді физикалық зерттеулерде тиімді қолдану үшін оның шектеулерін ескере отырып, үйлесімді әдістерді дамыту қажет.

#### ПАЙДАЛАНЫЛҒАН ӘДЕБИЕТТЕР

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## THE ROLE OF ARTIFICIAL INTELLIGENCE IN PHYSICS

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### Abstract

This article explores the potential applications of artificial intelligence (AI) in physics. AI assists in processing large datasets, solving complex physical problems, and developing new materials and theories. The article investigates AI's use in quantum physics, astronomy, materials science, and other fields of physics. Additionally, it discusses the future of AI in physics and the challenges that arise.

**Keywords:** *Artificial Intelligence, Physics, Quantum Physics, Data Analysis, Modeling, Big Data, Neural Networks, Machine Learning.*

## РОЛЬ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ФИЗИКЕ

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### Абстракт

В статье рассматриваются возможности применения искусственного интеллекта (ИИ) в физике. ИИ помогает обрабатывать большие данные, решать сложные физические задачи и разрабатывать новые материалы и теории. В статье исследуются направления использования ИИ в квантовой физике, астрономии, материаловедении и других областях физики. Также анализируются перспективы ИИ в физике и возникающие трудности.

**Ключевые слова:** *Искусственный интеллект, физика, квантовая физика, анализ данных, моделирование, большие данные, нейронные сети, машинное обучение.*

# Прогнозирование временных рядов с использованием модели ARIMA

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## **Аннотация:**

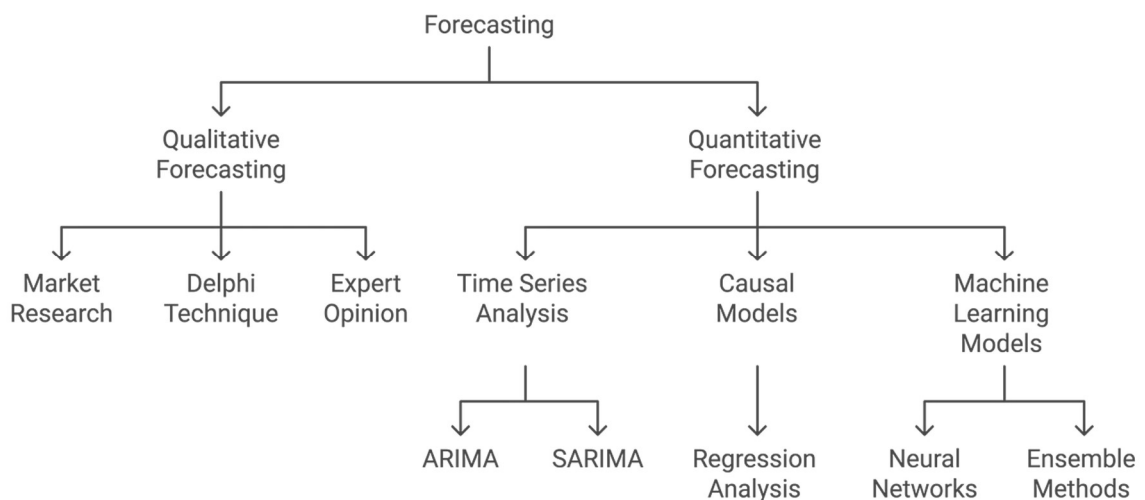
Модели прогнозирования временных рядов играют ключевую роль в статистическом анализе и прикладной математике. Одной из наиболее популярных моделей для работы с такими данными является ARIMA (AutoRegressive Integrated Moving Average). Модель ARIMA эффективно используется для прогнозирования будущих значений временных рядов. В данной статье рассмотрены основные компоненты модели ARIMA, такие как авторегрессия, интегрирование и скользящая средняя. Описаны методы их применения и алгоритмы выбора параметров для построения точных прогнозов. Также рассмотрены ограничения и области применения модели, что позволяет оценить её преимущества и недостатки в различных контекстах. В дополнение рассматриваются возможности использования ARIMA в сочетании с современными методами машинного обучения. Статья ориентирована на специалистов в области анализа данных, а также на тех, кто заинтересован в изучении методов прогнозирования временных рядов.

## **Основной текст статьи:**

Данные можно разделить на два типа в зависимости от их сбора: временные ряды и поперечные данные. Временные ряды относятся к данным, собранным через регулярные интервалы времени (например, ежедневно, ежемесячно или ежегодно). Поперечные данные, в свою очередь, собираются от различных субъектов, групп или сущностей в конкретный момент времени. Таким образом, временные ряды показывают изменения с течением времени, в то время как поперечные данные отражают состояние дел в определённый момент времени для множества объектов.

Использование данных временных рядов для прогнозирования будущих значений на основе временных характеристик называется прогнозированием. Прогнозирование можно разделить на две категории:

1. Качественное прогнозирование, которое основывается на субъективных суждениях и интуиции, а также на таких методах, как маркетинговые исследования и техника Дельфи.
2. Количественное прогнозирование, которое использует исторические данные и статистические методы, включая анализ временных рядов (такие как ARIMA и SARIMA), причинно-следственные модели (например, регрессионный анализ) и методы машинного обучения (например, нейронные сети).



**Рисунок 1. Структура методов прогнозирования**

Анализ временных рядов является важной частью научных исследований и практических задач в таких областях, как экономика, финансы, маркетинг и других. Временные ряды представляют собой последовательности наблюдений, измеряемых в определённые моменты времени, которые отображают различные тенденции и закономерности. Одним из наиболее эффективных методов для прогнозирования временных рядов является модель ARIMA (AutoRegressive Integrated Moving Average). ARIMA использует информацию о прошлом для предсказания будущих значений и позволяет учесть как сезонные, так и несезонные колебания данных.

### Математическая формулировка модели ARIMA

Модель ARIMA() объединяет три ключевых компонента:

1. **Авторегрессия (AR):** текущие значения зависят от линейной комбинации прошлых значений.
2. **Интегрирование (I):** делает временной ряд стационарным путём вычисления разностей.
3. **Скользящая средняя (MA):** учитывает прошлые ошибки прогноза.

### Практическое применение ARIMA

Модель ARIMA находит применение в различных областях:

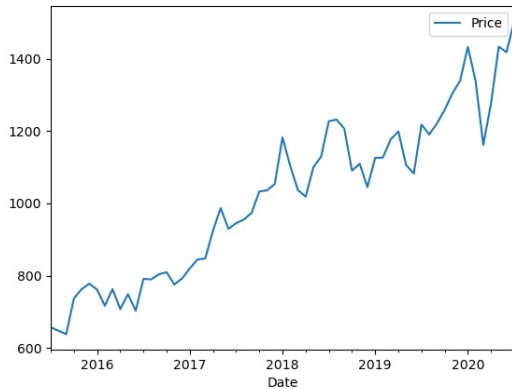
1. **Финансы:** прогнозирование временных данных, таких как цены акций или курсы валют.
2. **Энергетика:** оценка потребления электроэнергии.
3. **Логистика:** прогнозирование спроса на товары и оптимизация цепочек поставок.

Для практического применения ARIMA важным шагом является визуализация остатков модели и автокорреляционной функции (ACF). Эти инструменты позволяют оценить адекватность модели и выявить возможные ошибки.

### Декомпозиция временных рядов

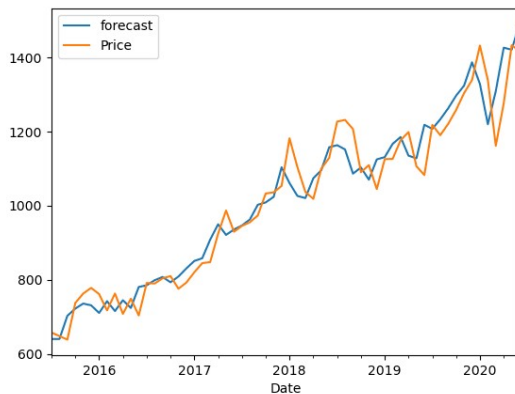
Для более глубокого понимания временных рядов их можно разложить на три компонента:

1. **Тренд:** долгосрочная тенденция изменения данных.
2. **Сезонность:** повторяющиеся колебания, зависящие от времени года или других факторов.
3. **Остатки:** случайные колебания, которые не поддаются объяснению трендом или сезонностью.



**График 1. Динамика изменения цен акций (NASDAQ: GOOGL)**

График иллюстрирует изменения цены акций компании Google на бирже NASDAQ. Каждая точка на графике соответствует определенной дате и цене акции.



**График 2. Прогнозируемые значения, модель ARIMA(1,1,1)**

Графики показывают результаты прогнозирования временного ряда с использованием модели ARIMA. Синяя линия отображает фактические данные, а оранжевая — прогнозные значения. Модель в целом точно улавливает общую тенденцию, хотя в некоторых периодах могут наблюдаться отклонения, что может свидетельствовать о наличии неучтённых факторов или нестабильности данных.

### **Заключение**

Модель ARIMA продолжает оставаться одним из наиболее востребованных методов для прогнозирования временных рядов благодаря своей простоте и гибкости. Несмотря на ограничения, такие как требование стационарности данных, ARIMA эффективно используется в сочетании с современными методами машинного обучения для повышения точности прогнозов. Перспективы прогнозирования временных рядов связаны с интеграцией традиционных моделей, таких как ARIMA, с методами глубокого обучения, что позволяет более эффективно обрабатывать как линейные, так и нелинейные закономерности в данных.

**Список источников:**

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6. [Mastering Time Series Forecasting with ARIMA in Python](#)
7. [ARIMA 3 Caseware](#)

# Methodological features of teaching to produce qualitative problems in teaching physics

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**Abstract:** Qualitative tasks occupy a special place in the study of physics, especially in the in-depth study of the subject. They contribute to the development of logical thinking, the ability to analyze physical processes, form the skills of generalizing and drawing conclusions. In the literature, this topic is emphasized in the methods of posing problems, strategies for solving them and the role of these tasks in learning.

**Keywords:** teaching methodology, problem-based learning, quality of education, teaching physics, pedagogical features.

## 1. The role of qualitative tasks in teaching physics

According to the research of E. I. Butikov [1], qualitative tasks allow students to have a deeper understanding of the basic physical laws. They contribute to the development of physical models that help explain phenomena. Qualitative tasks stimulate the formation of critical thinking and the establishment of causal relationships.

E. Zhomartov [2] the psychological and pedagogical aspects of teaching the solution of qualitative problems are considered, in which the importance of such tasks for the formation of active cognitive activity is emphasized.

## 2. Methodological approaches to solving quality problems

Many authors distinguish the following ways to learn how to solve quality problems:

### 1. modeling the physical condition

A. K. Sarieva [3] noted that the most important stage in solving qualitative problems is the creation of a physical model that simplifies the real situation for analysis.

### 2. algorithmic thinking

Viswambharan, A. In the works of P [4], it was proposed to use algorithms as a basis for systematizing approaches to solving qualitative problems. This simplifies the analysis process and helps students solve complex problems.

### 3. the use of didactic tools

The development of didactic materials (drawings, schemes, laboratory installations) allows students to visualize physical processes. According to A. B. Mazhenova [5], the use of such materials improves the absorption of the material.

## 3. Difficulties that arise when teaching quality problem solving

R. Basharuly [6] noted that the following difficulties arise in his work:

- Lack of abstraction skills.
- Difficulties in the transition from theory to practice.
- Low level of logical analysis skills.

These problems can be solved through systematic training and the use of an interdisciplinary approach.

#### 4. In-depth study of Physics and high-quality tasks

S. M. Kamiecko [7] in the in-depth study of physics, qualitative tasks are central. They allow students to go beyond the standard program, developing non-standard thinking and the ability to apply physics to real situations.

The advanced training methodology includes:

- Setting Research tasks.
- The use of interactive methods (discussion, discussion).
- Application of computer simulations.

The literature shows that qualitative tasks are a powerful tool for the development of cognitive activity of students and a deep understanding of physics. The methodology for their training should include modeling, Algorithmization, visualization and interdisciplinary elements. In-depth study of physics requires special attention to the development and application of high-quality tasks that help students develop skills of critical analysis and independent work.

### Conclusion

As I summarize my point, the topic is interesting in a way complex.

Why is it complicated? Because here we need to know what a qualitative report is, as well as what methodological features it has.

And here I looked at the works of various authors on this topic. I have divided the topic into several parts.

The role of qualitative tasks in teaching physics first, followed by methodological approaches to solving qualitative problems, difficulties arising in teaching to solve qualitative problems, the study of physics and qualitative tasks.

Now I will focus on each of them, the first of which is the formation of critical thinking in students through a qualitative task. And what is critical thinking? Critical thinking is critical thinking. And critical thinking, in simple terms, answers three questions. What is it?, what kind of thing?, for what?

And the advantage of critical thinking over other thinking is that each person can express their thoughts freely.

As for the second part, it was here that we talked about ways to solve quality problems.

That is, the approaches are modeling the physical condition, algorithmic thinking, the use of didactic tools. And among these approaches, I would say that this is the third type that I liked the most. This is because there is a lot of laboratory work in physics. And with this approach, it allows you to imagine the same works. And the third part, when teaching to solve quality problems, tells Here the difficulties when teaching to solve those quality problems.

That is, we will tell the student about the difficulties in the transition from theory to practice. Here in our question.

Often at school we explain theory to students, but what about practice?

And the most recent is the study of physics and high-quality tasks.

Physics it is one of the most difficult disciplines. For this purpose, it is necessary to study in depth.

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# Using Experimental Methods in Teaching Electric Current in Secondary School

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**Abstract:** Methodological features of the study of the «Electric current in various environments» section of the physics course in high school is one of the most important sections that helps students understand the nature of electric current, its course in conductors and dielectrics. The main purpose of this chapter is to show students the physical foundations of electric current and how it occurs in different media (solid, liquid and gaseous media). And also to explain the differences between electrical conductors and dielectrics, their electrical properties. Methodological foundations of training in this chapter will be aimed at considering the combination of theoretical and practical knowledge. Through various experimental and demonstration methods, students can see the behavior of electric currents in different environments. In addition, attention is paid to the development of skills in measuring and calculating parameters such as intensity, voltage and resistance of electric current in electrical circuits.

**Key words:** electric current, different environments, conductors, dielectrics, direct current, electrical resistance, ions.

## Introduction

The study of electric current in different media is a fundamental topic in the physics curriculum of secondary schools. Understanding how electric current behaves in various materials, such as conductors, semiconductors, and insulators, is essential for students to grasp key concepts of electrical circuits, energy transfer, and material properties. This topic bridges the gap between theoretical physics and practical applications, allowing students to connect classroom learning with real-world phenomena.

In teaching the chapter "Electric Current in Different Media," educators aim to foster a deep understanding of the nature of electric current, the factors influencing its flow, and how it varies in different materials. This chapter not only explores the properties of conductors and insulators but also introduces key concepts like resistance, Ohm's law, and the role of temperature in electrical conductivity. Through a combination of theoretical lessons and hands-on experiments, students can observe how electric current behaves in real-life situations. Moreover, effective teaching methods for this topic should focus on interactive learning, including the use of experiments, simulations, and technological tools. By engaging students with both conceptual and practical aspects of the subject, teachers can cultivate critical thinking skills and a stronger appreciation for the applications of physics in daily life and modern technology.

In this context, the methodology for teaching "Electric Current in Different Media" involves an integration of scientific inquiry, problem-solving approaches, and the use of modern teaching aids. The goal is not only to explain theoretical principles but also to develop students' ability to

conduct experiments, analyze results, and understand the real-world implications of electrical phenomena.

The teaching methods can be primarily divided into three groups from a didactic perspective. These are: scientific research, conclusion drawing, and teaching methods. The globalization of information is considered the main factor in increasing the intensity of the educational process. In recent years, terms like pedagogical technology and modular teaching have become more frequent, which urges a deeper understanding of the essence of these methods. In pedagogical technology, when guaranteed education is provided, it is important to apply not only these methods individually but also to use their names together. In teaching, applying methods in an interconnected way helps to reduce the density of information and enables the formation of the core concepts system. The foundation of pedagogical technology consists of a cohesive sequence that connects scientific research, conclusion drawing, and teaching methods. In the current stage of restructuring the education system, the development of students' creative abilities, the formation of systematic thinking, creativity, and the methodology of activity are becoming increasingly important issues. [1]

Universal electronic tutorial on the topic "Electric current in liquids" This tutorial allows for the study of electrical phenomena in liquids, activates students' independent work, enables conducting home physics experiments, helps to correct the material studied, and visualizes processes inside electrolytes by combining real experiments and their computer models.

It is known that electrolytes are substances through which electric current is conducted by ionic conductivity. Ionic conductivity refers to the ordered movement of ions under the influence of an external electric field. Electrolytes include solutions of acids and salts, as well as molten salts. Ions are atoms or molecules that have lost or gained one or more electrons. Positive ions are called cations, and negative ions are called anions.

The electric field that causes the ordered movement of ions is created in the liquid by electrodes (conductors) connected to a power source. The positively charged electrode is called the anode, and the negatively charged electrode is called the cathode. Positive ions, including metal ions and hydrogen ions, move toward the cathode, while negative ions, including acid residues and hydroxyl groups (OH), move toward the anode.

After studying the nature of electric current in different media, it is advisable to conduct a review of the entire topic. For this, it is necessary to focus on the most important questions: the nature of charge carriers, their movement in different media, and the volt-ampere characteristics of current for various media. It is recommended to make extensive use of the method of comparison. [2]

In the process of delivering lectures on physics, the demonstration materials used can be divided into several types based on their nature:

1. Objective (natural) experiments; 2. Educational films; 3. Educational posters; 4. Slides; 5. Models.

Objective demonstration experiments, which represent physical processes and phenomena in their natural form, have great didactic power due to their reliability, logical coherence, and emotional engagement for the listener. The logical, analytical, and mathematical conclusions derived from such experiments help ensure that students accept scientific knowledge in a complete and reliable way, reinforcing it firmly in their memory.

However, regardless of how rich in content, reliable, and emotionally charged the demonstration experiment may be, the student (listener) usually remains in the role of an observer during the lecture. In most cases, they only become familiar with the subject and, at best, understand it at a conceptual level. [3]

After studying the nature of electric current in different media, it is advisable to conduct a review of the entire topic. For this, only the most essential questions should be addressed: the nature of charge carriers, the character of their movement in different media, and the volt-ampere

characteristics of current for various media. It is recommended to make extensive use of the method of comparison.

In the study of this topic, students become familiar with different types of charge carriers. In metals, these are free electrons; in semiconductors, electrons and holes; in electrolytes, positive and negative ions; and in gases, free electrons and both positive and negative ions. Positive and negative ions in electrolytes are always components of the molecules of the dissolved substance, which dissociate as a result of electrolytic dissociation, as well as the solvent. [2]

One of the important issues in teaching physics is ensuring the development of high creative thinking abilities in students when receiving information through lectures. Any creative ability develops over time during activity. Various experimental tools of physics provide an effective way to utilize this in the process of developing such abilities.

Experiments have shown that the use of demonstration experiments as developmental teaching tools creates great opportunities. The experiment not only presents information in a problem-solving way but also ensures the completeness and reliability of logically and analytically defined scientific content. Additionally, it serves as a rich source of scientific information and can also be an important tool for assessing the level of students' knowledge acquisition in the context of the current rating system, which is implemented in educational institutions at all levels.[3]

## Methodology

### 1. Integration of Theory and Experimentation

**Theory:** Start with the foundational concepts, such as the definition of electric current, Ohm's law, resistance, and the factors that influence current in different materials (e.g., temperature, material type, and physical dimensions).

**Experiments:** Engage students with hands-on activities that demonstrate how electric current behaves in various environments. Experiments can include:

Measuring current and voltage in simple circuits using conductors and resistors.

Observing the effect of changing temperature or material (e.g., copper vs. rubber).

Investigating semiconductor behavior, using diodes or transistors.

### 2. Conceptual Understanding and Visualization

**Diagrams and Models:** Use visual aids like circuit diagrams, flow charts, and models to represent the flow of current and the characteristics of materials. This helps students grasp abstract concepts like electron movement and the role of atoms in conducting electricity.

**Simulation Tools:** Software and simulations can provide students with a dynamic environment to visualize electric currents and explore how they behave in different conditions. For example, using virtual labs to observe how different materials conduct electricity.

### 3. Contextualization and Real-World Applications

**Real-World Examples:** Show how electric current is applied in everyday life, from household wiring to the functioning of electronic devices. Discuss how the materials used in different environments (e.g., metals for conductors, semiconductors for transistors) affect the performance of electrical circuits in real-world applications like computers or renewable energy systems.

**Industry Examples:** Introduce case studies from electronics, telecommunications, or power generation to highlight the importance of understanding electric current in various environments.

### 4. Problem-Solving and Critical Thinking

**Mathematical Modeling:** Encourage students to use mathematical approaches (like Ohm's Law, the formula for resistivity, and the relationship between current, voltage, and resistance) to solve problems related to electric current.

**Critical Analysis:** Engage students in discussions about the properties of different materials and the factors that influence electrical resistance (e.g., temperature, material properties). This

cultivates critical thinking and an understanding of how electric current is affected by different environments.

### 5. Development of Practical Skills

**Lab Skills:** Develop practical skills in students, such as how to safely work with electrical circuits, use of ammeters and voltmeters, and how to measure resistance. Ensuring proper laboratory safety protocols is crucial.

**Data Analysis:** Encourage students to gather data from experiments and use it to draw conclusions. For example, how the resistance of a material changes with temperature or how different materials compare in terms of conductivity.

### 6. Interdisciplinary Approach

**Linking with Other Disciplines:** The study of electric current in various environments can be linked with chemistry (study of atomic structures and electron flow), material science (properties of conductors and insulators), and engineering (design of circuits). This interdisciplinary approach helps students see the broader impact of their learning.

### 7. Use of Technology and Modern Tools

**Technology in Teaching:** Incorporate digital tools, such as data loggers, sensors, and interactive whiteboards, to enhance understanding. This can include the use of tools that measure current and resistance in real-time during experiments or simulations that allow students to explore theoretical concepts in a controlled environment.

**Online Resources:** Leverage online platforms that provide physics simulations or educational videos explaining complex ideas in simple terms. Websites like PhET or interactive tutorials can supplement classroom teaching.

### Conclusion

The study of "Electric Current in Different Media" plays a crucial role in helping students understand the fundamental principles of electric current and its behavior in various materials. This topic not only enhances theoretical knowledge but also develops practical skills that are essential for understanding real-world phenomena. By exploring the properties of conductors, insulators, and semiconductors, students gain a deeper understanding of the nature of electric current and how it flows in different materials, which is key for future studies in physics and engineering.

The methodology for teaching this topic effectively combines theoretical lessons with hands-on experiments. Engaging students in practical activities, such as measuring current, resistance, and voltage in different materials, allows them to connect abstract concepts with real-life applications. This approach strengthens critical thinking and problem-solving skills, while also fostering a deeper appreciation for the scientific method and experimental research. In addition, the use of modern technological tools, such as simulations and multimedia resources, makes the learning process more interactive and accessible, helping to visualize complex physical phenomena and making the subject more engaging. Through these methods, students are encouraged to explore the subject matter actively and develop scientific inquiry skills.

In conclusion, teaching the topic of "Electric Current in Different Media" not only helps students master fundamental physical concepts but also equips them with essential skills for scientific research, critical analysis, and problem-solving. This knowledge forms a strong foundation for further studies in physics, technology, and engineering, and sparks curiosity for future learning and discovery.

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# The Content and Conceptual Specifics of a Quantum Physics Course

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**Abstract:** This article analyzes the significance and content of the quantum physics course as a component of educational programs in the field of physics. The study examines the fundamental principles and concepts of quantum mechanics that form the core of the course, such as energy quantization, the uncertainty principle, state superposition, quantum entanglement, and other essential phenomena. The article also discusses teaching methodologies, the challenges learners face in mastering quantum mechanics, and the importance of practical applications of quantum technologies in modern innovative fields such as quantum computing, quantum cryptography, and nanotechnology. Furthermore, the article aims to provide a deeper understanding of the structure and content of the quantum physics course.

**Keywords:** uncertainty principle, learners, quantum physics, energy quantization, entropy, physics course.

Quantum physics is a branch of theoretical physics that studies the behavior of matter and energy at the level of atoms, molecules, and subatomic particles. The purpose of the quantum physics course is to introduce learners to the fundamental principles, laws, and mathematical methods that describe these phenomena and to teach them to apply this knowledge to solve fundamental and applied problems.

The quantum physics course is an integral part of educational programs in the fields of natural sciences and engineering. With the advancement of scientific knowledge and technology, quantum physics has laid the foundation for understanding the fundamental laws of nature that govern the behavior of particles at the microscopic level. The content and significance of the quantum physics course encompass a broad range of topics, from the mathematical foundations and principles underlying quantum mechanics to technologically significant applications such as semiconductor electronics, lasers, and quantum computing. In this regard, it is clear that the course stimulates learners' interest.

Quantum physics and its core theories – quantum mechanics and quantum field theory – emerged in the first half of the 20th century as a result of research conducted by renowned scientists such as M. Planck, A. Einstein, E. Schrödinger, Louis de Broglie, P. Dirac, N. Bohr, W. Pauli, W. Heisenberg, M. Born, and L. Boltzmann [1].

Students studying the quantum physics course frequently encounter a range of issues and questions that require clarification and deeper understanding. These problems are both theoretical and practical, relating to the comprehension of quantum mechanics' abstract concepts, its subject-specific aspects, and the application of acquired knowledge.

The aim of this article is to examine the fundamental aspects of the quantum physics course, its structure, and development, as well as to evaluate the methods of teaching and applying theoretical knowledge in practical fields. Particular attention is given to key concepts such

as energy quantization, superposition of states, the uncertainty principle, quantum interference, and entropy, along with their implications for future scientific and technological advancements.

The aim of the article is to examine the key aspects of the quantum physics course, its structure and development, and to assess methods for teaching and applying theoretical knowledge in practical fields. Particular emphasis is placed on fundamental concepts such as energy quantization, superposition of states, the uncertainty principle, quantum interference, and entropy, as well as their influence on future scientific and technological advancements.

Overall, quantum physics is a branch of theoretical physics that explores phenomena at the microscopic level, where the laws of classical mechanics are no longer applicable. It investigates unique phenomena such as wave-particle duality, the uncertainty principle, and quantum entanglement. Discoveries brought about by quantum theory not only revolutionized our understanding of nature but also led to the development of groundbreaking technologies that have transformed daily life, ranging from semiconductors and lasers to quantum computing and medical technologies.

Today, quantum physics is not just a theoretical discipline but also an essential part of applied sciences such as quantum technology, nanotechnology, and quantum information science. These fields pave the way for groundbreaking innovations, including ultra-fast computing systems, secure data transmission methods, and even new forms of energy.

Moreover, the quantum physics course provides the foundation for studying the laws of the microscopic world, where the behavior of matter and energy significantly differs from the classical worldview. Unlike macroscopic objects governed by the laws of classical mechanics, microscopic particles such as atoms and fundamental particles adhere to the principles of quantum mechanics. This adherence gives rise to phenomena such as wave-particle duality, uncertainty, superposition of states, and quantum entanglement.

The quantum physics course is built upon several fundamental concepts:

The principle of energy quantization states that any system of interacting particles capable of forming stable states – such as a part of a solid, a molecule, an atom, or an atomic nucleus – can exist only at specific energy levels [2]. This principle, discovered in the early 20th century, is one of the most significant aspects of quantum mechanics. Energy quantization means that energy, momentum, and other physical quantities do not take any possible values, as in classical physics, but instead can only adopt discrete values.

The superposition principle, one of the fundamental principles of quantum mechanics, states that a quantum system can exist in multiple states simultaneously, and it is only upon measurement that the system 'chooses' one of these states [3, p. 27].

The quantum physical probabilities and the uncertainties associated with the behavior of micro-objects and quantum dynamic systems are fundamental in nature – without them, quantum physics would not be possible. However, the stochastic ambiguity and uncertainty in their behavior represent just one aspect of quantum reality. This is known as the uncertainty principle.

First introduced in 1927 by German physicist Werner Heisenberg, the uncertainty principle states that it is impossible to measure two conjugate quantities, such as a particle's position and momentum, with arbitrary precision simultaneously. This phenomenon lies at the heart of quantum uncertainty and has profound philosophical and physical implications [4].

One of the prominent and respected physicists of the 20th century, Victor Weisskopf, expressed the following opinion: 'The uncertainty principle, which is typically cited as the foundation of quantum theory and seems to plunge quantum physics into a fog of probability, is not at all fundamental, but is certainly something to consider in order to avoid logical contradictions' [5, p. 46-53].

Quantum interference is a phenomenon in which the wave functions describing quantum systems reinforce or cancel each other out, producing new results that cannot be predicted by

classical physics. This phenomenon forms the basis of many quantum technologies, such as lasers and interferometers. Researchers suggest that the quantum interference phenomenon utilizes the ability of quantum objects to exist in multiple states simultaneously. Imagine an electron in superposition – it exists at two different points in space at the same time [6].

Entropy (from Greek *en* – 'inside' and *trope* – 'turning') is one of the key concepts in thermodynamics, describing the state of a system. It is also the measure of the dissipation or degradation of energy within the system, indicating the impossibility of the system spontaneously converting to other forms of energy [7].

According to the second law of thermodynamics, the entropy of an isolated system either increases or remains constant. We can say that the behavior of entropy points in the direction of time.

Today, one of the fundamental concepts related to these phenomena is quantum entanglement. Quantum entanglement refers to the condition in which two or more particles are in a state such that the change in one particle's state instantly affects the state of another, regardless of the distance between them [8, pp. 68-75]. This phenomenon is actively used in the fields of quantum computing and cryptography.

The content of the quantum physics course is designed to familiarize learners with the fundamental principles and mathematical methods underlying quantum theory. The course covers both the theoretical foundations of quantum mechanics, such as Schrödinger's equation, Heisenberg's uncertainty principle, wave functions and their interpretations, as well as practical aspects such as quantum statistics, particle interactions, and the application of quantum phenomena in modern technologies.

The course content for learners should be structured in a way that ensures a comprehensive understanding of both the theoretical foundations of quantum phenomena and their practical applications. The course should integrate the mathematical and conceptual aspects of quantum mechanics and be accessible to learners at various levels. Specifically, the introductory section of the course will cover: the historical context of the emergence of quantum physics; the fundamental ideas and principles of quantum mechanics; and an overview of the current state of quantum physics and its applications in modern technologies.

In the main section of the course, topics such as the mathematical foundations of quantum mechanics, Heisenberg's uncertainty principle, energy quantization, and the wave nature of particles, among others, are covered.

The conclusion of the course should focus on engaging learners by addressing the current applied directions of quantum physics, such as quantum technologies, nanotechnology, lasers and semiconductors, medical applications, and other practical uses.

For teaching the quantum physics course, it is essential to balance theoretical explanations with practical examples and exercises, ensuring that the materials are presented clearly and accessibly. Assignments and laboratory work should aim to reinforce the knowledge acquired and develop the skills necessary for working with quantum systems.

However, the course may present some challenges related to the application of quantum physics. In particular:

- The different interpretations of quantum mechanics may be perplexing to learners.
- Learners may struggle to immediately understand how a quantum system can exist in multiple states simultaneously and what this implies from the perspective of an observer and probability.

- Learners may not immediately recognize how the theoretical aspects of quantum mechanics are applied in real life, such as in quantum computing, quantum cryptography, nanotechnology, and other fields of modern technology. The difficulty in understanding these

applications arises from the fact that these technologies often require complex knowledge and integration of various scientific disciplines.

- If there are insufficient practical examples, laboratory work, and exercises to reinforce the theoretical knowledge, learners may face difficulties in understanding the theoretical aspects of quantum mechanics.

- Learners, particularly those in the field of information technology, may be interested in applying quantum physics to develop new methods of computation and data protection. However, questions may arise about the practical implementation of these technologies in the future.

However, the interests and challenges of students studying quantum physics vary, influencing both the theoretical and practical aspects of the science. These issues require careful instruction and the use of modern methods and resources to make complex concepts more accessible and understandable.

## Conclusion

In conclusion, the quantum physics course is an integral part of educational programs in physics and related sciences, providing students with fundamental knowledge about the laws of the microscopic world, which are radically different from the phenomena observed in the macroscopic world. The essence and content of the course cover a wide range of foundational concepts and principles, such as quantization, the uncertainty principle, the superposition of states, and quantum entanglement, ensuring a deeper understanding of the nature of matter and energy at the smallest scales.

The learning process in quantum physics requires students not only to master the subject-specific methods and theoretical foundations but also to apply their knowledge to solve real scientific and technological problems. The significance of the course also lies in its ability to open up perspectives for further research and development of new technologies, such as quantum computing, quantum cryptography, and nanotechnology.

Overall, the quantum physics course not only contributes to a deep understanding of the fundamental processes underlying nature but also prepares specialists capable of applying this knowledge to address current issues in science and technology, ensuring that it remains a crucial element of modern education in the natural sciences.

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# Methods for Calculating the Efficiency of Wind Turbines in the Physics Curriculum

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**Abstract:** This article discusses the methodology for calculating the aerodynamic characteristics and technical-economic indicators of prospective wind power installations in teaching 11th-grade physics. The introduction of engineering analysis methods into the school curriculum allows students to gain a deeper understanding of physical phenomena related to aerodynamics and wind energy, as well as highlights the importance of an interdisciplinary approach in solving contemporary energy issues. The use of such methodologies enhances students' interest in science and technology, develops their analytical thinking skills, and fosters an understanding of the practical application of physical laws in real life.

**Keywords:** Aerodynamics, wind turbines, technical and economic indicators, renewable energy, physics.

## Introduction

Modern education in the field of physics requires the integration of relevant scientific and technical knowledge that motivates students and promotes their comprehensive development. One of the important topics in this regard is the use of renewable energy sources, including wind energy. Wind energy is a key direction in global energy, and understanding its principles requires the study of aerodynamics, mechanics, and fluid physics.

This article proposes the use of a methodology for calculating the aerodynamic characteristics and technical-economic indicators of prospective wind installations in the 11th-grade physics curriculum. This methodology is based on classic aerodynamics theories as well as the consideration of factors affecting the performance of wind installations, such as dynamic flow separation. The application of these methods will help students better understand the fundamental physical principles behind the operation of wind turbines and the importance of considering economic aspects in the design of energy installations. The main goal of using such interdisciplinary methodologies in schools is not only to deepen students' knowledge of physics but also to develop the ability to apply theoretical knowledge in practice. Additionally, discussing energy efficiency and sustainable development issues will enhance students' environmental awareness and contribute to a better understanding of global energy challenges.

The development of wind energy is fundamentally changing the concept of global energy. The production of machines that convert wind energy has led to rapid advancements in both applied and fundamental research, as well as an increased interest in creating wind installations.

Wind energy has emerged as a significant source of renewable energy, especially in light of global climate issues. According to the Global Wind Energy Council (2023), the total wind energy capacity is expected to grow to 116,065 GW by the end of 2023, showing rapid development worldwide. This growth highlights the importance of optimizing wind turbine design, especially for urban and small-scale applications. The added capacity has increased by 34% compared to 2022,

reaching 86 gigawatts. This global growth rate is 12.5%, which is considerably higher than the 10.2% increase in wind capacity from 2022 (Global Wind Energy Council, 2023).

In recent years, wind energy has significantly developed and has become a crucial part of the global energy balance, especially in Europe and Asia. The demand for strong and reliable wind installations is growing, which encourages the development and implementation of new technologies to improve their efficiency (Pérez et al., 2013). One important aspect to consider when designing and operating wind turbines is the reliability of the main components, such as the blades, gearbox, generator, and control systems, as they are prone to failure and often require complex maintenance (Ribrant & Bertling, 2007).

#### **Aerodynamics of wind turbines indicators.**

Various configurations are used to increase the reliability of wind generators. For example, DD (Direct Drive) turbines, which do not have a gearbox, are more reliable than those with gearboxes because their structure contains fewer moving parts that require regular maintenance (Polinder et al., 2007) [4]. However, the components of such turbines are large and complex, making them more expensive (Spinato et al., 2009) [6].

Condition monitoring systems and fault detection algorithms that allow the prediction of turbine failures help reduce downtime. These systems enable the early detection and resolution of device malfunctions, thereby reducing turbine downtime and operating costs and increasing their overall availability (Kusiak & Li, 2011) [3]. It is important to ensure that turbines can operate over a wide wind speed range using methods for calculating aerodynamic characteristics, such as frequency partial and full converters, as well as technologies like pitch control, which adjust the blade angle. This enables more efficient energy conversion in turbines (Hansen et al., 2004). The efficient use of wind energy is directly related to managing the aerodynamic characteristics and loads of large wind turbines. Dai, Hu, Liu, and Long (2011) proposed a comprehensive method for calculating aerodynamic loads by combining the blade element momentum (BEM) theory with a modified dynamic delay model. This analysis was applied to MW-level wind turbines. The authors focused on improving their models to accurately calculate aerodynamic loads under complex and realistic conditions [7].

One of the most important factors in wind turbine design is optimizing their aerodynamic and mechanical properties. To improve turbine efficiency, it is necessary to analyze the aerodynamic characteristics of the blades and turbine components. The use of new technologies, such as accelerated research and computer modeling methods, contributes to improving turbine efficiency.

BEM theory is often used in aerodynamic load analysis because it is simple and efficient in calculations, and requires much less time compared to full computational fluid dynamics (CFD) methods (Dai et al., 2011). However, traditional BEM methods cannot accurately capture the complex effects of the wind, dynamic delay, wind shear, and turbulence. To address these shortcomings, the authors applied a modified version of the BEM theory, which includes additional Prandtl and Buhl models to improve accuracy. Additionally, a dynamic delay model specifically adapted for the NACA63-4xx airfoil was introduced.

Researchers introduced multiple coordinate systems to accurately calculate aerodynamic loads, which allows for considering dynamic phenomena such as tower shadow effects and blade vibrations. Secondary algorithms were used to determine induction coefficients, and a reliable model for real-time engineering calculations was developed.

Wind energy is environmentally very beneficial. Wind turbines contribute to maintaining ecological balance by preventing the release of carbon dioxide into the atmosphere. Moreover, they are significantly cleaner and safer compared to other methods of energy production. However, wind turbines also have some environmental impact. For example, the noise level of

wind turbines can affect people's lives in some cases, especially when installed in densely populated areas.

The future of wind turbines can be improved through new technologies and materials. To efficiently utilize renewable energy sources, it is necessary to improve their structural components and operating conditions. Additionally, new methods and strategies are being developed to minimize the environmental impact of wind turbine installation and operation.

Studies show that the noise produced by wind turbines consists of two main sources: mechanical and aerodynamic noise. Mechanical noise comes from moving parts such as the gearbox and cabin rotation mechanism, while aerodynamic noise is generated by turbulence in the airflow around the rotor blades (Katinas et al., 2016) [1].

Predicting the acoustic pollution levels in residential areas is one of the main tasks. In this regard, a mathematical model and methodology for evaluating noise propagation that enables the assessment of acoustic impact have been developed (Katinas et al., 2016). Low-frequency wind turbine noise significantly affects the human body, especially at night when the ambient background noise level is lower, making the wind turbine noise more pronounced. Measurements show that with increasing wind speed, the wind turbine noise level increases, and at distances greater than 100 meters from the tower, when the wind speed is about 12 m/s, it reaches the background noise level. Thus, at high wind speeds, the wind turbine noise is masked by the background environmental noise, which makes it difficult to accurately assess the impact on health and well-being (Katinas et al., 2016). These findings highlight the importance of understanding the noise generation mechanism and its effect on different frequencies, which is necessary to develop effective strategies for reducing noise levels [2].

### *Methodology*

#### **1. Theoretical Research Methods**

**Modeling and Mathematical Calculations:** To calculate the aerodynamic characteristics of wind turbines, it is necessary to create mathematical models. This method helps in calculating wind speed and turbine blade efficiency, as well as predicting the turbine's energy output. For example, Newton's second law can be used to calculate aerodynamic loads or the power output of the blades.

**Calculating Power Coefficient and Efficiency:** Special mathematical formulas can be used to calculate turbine efficiency, such as the Betz limit (the maximum efficiency of a turbine). It is important to analyze the wind turbine's performance while considering these limits.

#### **2. Experimental Research Methods**

**Wind Turbine Testing:** Testing different wind turbines or their components in a laboratory or real-world conditions. Through this research method, you can determine the efficiency of various turbine configurations and their operating conditions.

**Data Collection:** Measurement tools are used to collect data on local wind conditions and the actual performance of the turbine. For example, collecting data on wind speed, pressure, and temperature can help determine the turbine's operational results.

The research conducted on the methods for calculating the aerodynamic and techno-economic characteristics of wind turbines, using the core principles and theoretical knowledge of the 11th-grade physics curriculum, provides an opportunity to understand wind energy. Let's consider the key conclusions obtained during this study in relation to the fundamental concepts and laws of physics:

**Aerodynamics and Forces:** When studying motion and forces in a physics class, the working principles of wind turbines provide a good example. The forces acting on the turbine blades and their aerodynamic properties follow Newton's second law. By calculating all the forces affecting the rotation of the blades, students can develop the concept of directing these forces appropriately to increase the efficiency of power generation.

**Conservation of Energy:** The process of converting wind energy into electrical energy follows the law of conservation of energy, which is widely taught in physics courses. The mechanical energy of the wind turbine is converted into electrical energy through the blades. The efficiency and losses in this process are calculated using the law of conservation of energy.

**Power and Efficiency Calculations:** The concepts of power and efficiency studied in physics classes play a crucial role in describing the operation of wind turbines. When calculating the power and efficiency of a turbine, it is necessary to consider how mechanical energy is converted into electrical energy and account for any energy losses. These calculations are primarily based on power equations and the concept of efficiency.

**Velocity and Flow:** Understanding the movement of the wind and its effects requires knowledge of flow theory and the concept of velocity. In the operating principles of wind turbines, it is important to calculate the wind's speed, density, and direction, and consider these parameters to ensure the turbine operates efficiently. This is related to the study of fluid and gas movement in physics.

**Ecological and Technical Efficiency:** The importance of environmentally efficient energy sources was emphasized during the study. In physics classes, solving problems related to ecological issues and energy efficiency allows for evaluating the future of wind energy. To achieve higher efficiency, turbine designs and maintenance methods must be improved, which is carried out based on physical laws.

### Conclusion

The results obtained during the study help in understanding important concepts in physics and demonstrate how they are applied in real life. Deepening knowledge of wind energy, while teaching this topic within the framework of the 11th-grade physics course, enables students to better grasp the scientific fundamentals in this field.

Thus, the conclusion of the research can be drawn by stating that understanding the methodology for calculating the aerodynamic and techno-economic characteristics of wind turbines, using the basic concepts of physics, provides insight into future research and the prediction of innovations in the field.

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# The Physics of Solar Panels: Principles of Operation and Technologies

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**Abstract:** This paper discusses the physical principles of solar panels, their technology, different types and efficiency according to climatic conditions. Solar energy is widely used worldwide as a clean and renewable source of energy. The features and applications of each of monocrystalline, polycrystalline, thin film, organic and hybrid solar panels are also discussed. The effects of temperature and climatic conditions on solar panel efficiency are discussed, as well as the cooling methods used to ensure panel longevity. Also touched upon are the directions of production and development of solar panels.

**Keywords:** Solar panel, monocrystalline solar panel, polycrystalline solar panels, thin-film solar panels, photovoltaic effect, organic solar panels, hybrid solar panels, energy efficiency, climatic factors, cooling solutions, solar energy, renewable energy, solar power systems.

## Introduction

Solar energy is one of the renewable energy sources, an environmentally friendly and infinite power source. Solar energy is widely used around the world, and its technological development is steadily increasing. This work examines the operating principles of solar panels, their types, efficiency in different climatic conditions, and the future development directions (Fraas, 2014). Solar panels play a crucial role in the global energy system as they help reduce carbon emissions and are considered clean energy sources (Green et al., 2018).

## Types of Solar Panels and Their Characteristics

Nowadays, solar panels are manufactured using different technologies, with types varying in terms of efficiency and production costs. There are three main types of solar panels: monocrystalline, polycrystalline, and thin-film panels (Askari, Mirzaei, & Mirhabibi, 2015). Each type has its own advantages and disadvantages, making them suitable for different applications.

### Monocrystalline Solar Panels

Monocrystalline solar panels are made from a single piece of silicon crystal, which makes them highly efficient. While this technology demonstrates high performance, it is also more expensive, as the production of monocrystals is complex and costly. However, these panels are known for their long-term durability, with a typical lifetime of 25-30 years (Askari et al., 2015). These panels can collect a large amount of energy as they absorb sunlight very efficiently.

Monocrystalline panels are particularly effective in limited spaces, as their high density and performance do not require a large area. Their main drawback is the high cost, but this is justified given their high efficiency and long lifespan.

### Polycrystalline Solar Panels

Polycrystalline solar panels are made from several smaller silicon crystals, which reduces their efficiency but makes them cheaper to manufacture. These panels are typically an economically viable solution, especially for projects where price and quality are important. While the efficiency of polycrystalline panels is lower than that of monocrystalline panels, they are widely

used because of their significantly lower production costs. For this reason, they are commonly used in many medium- and small-scale projects (Askari et al., 2015). Although polycrystalline panels are resistant to temperature changes, their efficiency may decrease when sunlight is limited. This makes their performance dependent on climatic conditions. Nevertheless, they have a high potential for use in many residential and commercial applications.

#### Thin-Film Solar Panels

Thin-Film solar panels are characterized by their high flexibility and light weight. These panels are made by applying photosensitive layers in thin film form, which reduces their production cost but also decreases their efficiency. Thin-film panels are often used for installation in large areas because they are more effective when used in large systems (Askari et al., 2015). These panels are highly resistant to light and temperature, though their efficiency still tends to be lower in many cases.

The main advantage of thin-film panels is their structural flexibility, which allows them to be installed on various surfaces. For this reason, they can be used on building roofs and walls, as well as in many other structures. However, their low efficiency limits their widespread use.

#### Organic Solar Panels

Organic solar panels are made from polymer materials, which make them less efficient than silicon-based technologies. The main advantage of these panels is their flexibility and light weight. However, this technology is still not widely used and faces many engineering challenges. Organic panels are environmentally attractive and cheaper to produce, but their energy efficiency is still low. The potential of this technology may lead to its wider adoption in the future for various new applications (Askari et al., 2015).

#### Hybrid Solar Panels

Hybrid solar panels combine two technologies, such as silicon and thin-film, which ensures their high efficiency. Hybrid panels can work effectively in various climatic conditions, expanding their scope of use. They are well-suited to high temperatures and varying light conditions, making them useful in many situations. However, they are still sold at a higher price, but their long-term efficiency and stability make them attractive for future projects (Askari et al., 2015).

### Technical Characteristics of Solar Panels

Solar panels are devices that convert sunlight into electrical energy, and their efficiency and operational parameters vary based on various factors. These characteristics are crucial for energy production and the long-term operation of the panels. Key parameters such as efficiency, power output, voltage, and current ratings differ depending on the type of panel.

#### Efficiency of Solar Panels

The efficiency of a solar panel is its ability to convert solar energy into electrical energy. For example, SunPower's monocrystalline panels have an efficiency of up to 22%, which is among the highest in the industry (SunPower, n.d.). LG Solar panels can reach efficiencies of up to 21%, while the efficiency of Canadian Solar's polycrystalline panels ranges from 15% to 18% (Canadian Solar, n.d.). Thin-film panels, such as those from Q CELLS, typically have lower efficiency (10-12%) and produce less power (Q CELLS, n.d.).

The power output of a solar panel is also an important parameter. The output power varies depending on the panel's efficiency and operating conditions. For example, Q CELLS panels can produce 340-370 W, while Canadian Solar panels generate between 270-320 W (Q CELLS, n.d.; Canadian Solar, n.d.). Thin-film panels typically produce between 150-200 W.

The voltage and current characteristics of solar panels determine their operation and integration into the electrical grid. Most solar panels operate at a voltage between 30-40 V. LG Solar panels have a voltage range of 36-40 V, and their current characteristics vary between 6-9 A, depending on the panel's power (LG Solar, n.d.).

It is also important to note that temperature affects the efficiency of solar panels. High temperatures cause a decrease in panel efficiency. According to NREL studies, panel efficiency decreases by approximately 0.4% for every degree increase in temperature (NREL, n.d.). Therefore, it is crucial to consider temperature and climatic conditions when installing solar panels.

### **Operating Principles of Solar Panels**

Solar panels use the photovoltaic effect to convert sunlight into electrical energy. This process occurs when semiconductor materials like silicon absorb the energy of sunlight. When sunlight hits the surface of the semiconductor material, its energy is transferred to electrons, causing them to be released from atoms, which results in the flow of current (Fraas, 2014). This phenomenon is known as the photovoltaic effect, which is the fundamental principle of converting solar energy into electrical energy.

Panels based on the photovoltaic effect are typically made from silicon because silicon is abundant in nature and has excellent electrical conductivity properties. Monocrystalline and polycrystalline silicon are the two primary types of silicon used in solar panels. Monocrystalline silicon's high efficiency and performance are due to its uniform structure and the proper arrangement of atoms, which improves energy production efficiency (Green et al., 2018). Although polycrystalline silicon is cheaper to manufacture, its efficiency is lower because the atoms in its structure are not as well ordered.

The performance and efficiency of solar panels are influenced by several factors related to climatic conditions. These factors mainly include temperature, humidity, solar radiation intensity, and duration of sunlight exposure.

When considering the impact of temperature, it is important to note that high temperatures negatively affect solar panels. At high temperatures, the electrical conductivity of semiconductor materials in the panels decreases. This process limits the panel's ability to produce electrical energy. According to NREL studies, a 1°C increase in temperature reduces the efficiency of solar panels by 0.4% (NREL, n.d.). Therefore, when installing solar panels, it is essential to protect them from high temperatures or consider the climatic conditions.

Additionally, the angle at which solar panels are installed also affects their performance. This factor varies based on the direction of sunlight, geographical location, and time of year. By installing solar panels at the optimal angle, their efficiency can be increased. The most efficient installation angle varies for each region based on geographical latitude and climatic features. For example, in regions closer to the equator, panels should be installed to directly face the sun, while in polar regions, the angle needs to be adjusted. This issue is addressed through specific studies conducted in various climatic zones (Fraas, 2014).

The widespread use of silicon in solar panels directly influences their efficiency and lifespan. The natural properties of silicon, especially its electrical conductivity, make it an ideal material for photovoltaic systems. Monocrystalline silicon panels have high efficiency due to their homogeneous atomic structure and well-organized crystal lattice, resulting in up to 22% efficiency in energy production (SunPower, n.d.). These panels are chosen for their high energy output and long service life.

Polycrystalline silicon panels are cheaper, but their efficiency is lower compared to monocrystalline silicon panels. The efficiency of polycrystalline silicon panels ranges from 15-18% (Canadian Solar, n.d.). The atoms in the material are not uniformly arranged, which reduces their electrical conductivity. However, the low cost of polycrystalline silicon makes these panels accessible to many users.

The environmental impact and recyclability of silicon make it an ecologically friendly material. Silicon is abundant and easy to recycle, making it environmentally sustainable. The use of silicon, especially polycrystalline silicon, in solar panels not only generates solar energy but also ensures ecological safety.

### **Efficiency of Solar Panels in Different Climatic Conditions**

The efficiency of solar panels varies depending on temperature and climatic conditions. High temperatures reduce the efficiency of panels, while they perform better in colder climates. Additionally, the efficiency of solar panels also changes based on geographic location and the angle at which the panels are installed (Honsberg & Bowden, 2014).

#### **Impact of Temperature on Solar Panels**

The efficiency of solar panels is significantly affected by environmental temperature, solar radiation, and other climatic parameters. It is well-known that an increase in temperature reduces the efficiency of solar panels. Studies show that for every 1°C increase in temperature, the power output of the panels decreases by approximately 0.4-0.65%. This phenomenon negatively impacts the open-circuit voltage and overall power capacity of the panels (Meflah et al., 2023; Mussard, 2017). For example, experiments conducted in Serbia showed that when the temperature of panels was 20°C in December, their efficiency reached 16%, while in August, at 55°C, the efficiency dropped to 10% (Mussard, 2017).

#### **Use of Various Cooling Methods**

To reduce the operating temperature of solar panels, various cooling methods are employed, which can be broadly categorized into natural and artificial methods.

##### **Natural Cooling Methods:**

Among the natural cooling methods, the use of plants has been found to be particularly effective. For example, the natural humidity and evaporation properties of the Aloe Vera plant help lower the temperature of solar panels, playing a key role in enhancing their electrical efficiency. Similarly, the Ficus plant stabilizes the temperature of the panels through evaporation, improving their performance (Maskaren et al., 2024).

##### **Artificial Cooling Methods:**

Active cooling techniques, such as water circulation systems or heat exchanger devices, are considered effective for reducing the heat of solar panels. Additionally, technologies like phase change materials (PCMs) are widely used. Each of these methods works more efficiently under specific climatic conditions (Meflah et al., 2023; Maskaren et al., 2024).

#### **Solar Panels in Cold Climate Conditions**

In cold climatic regions, the efficiency of solar panels tends to be higher. This is explained by the increased energy production capability of panels under low-temperature conditions. Cold weather lowers the operating temperature of the panels, thus improving their electrical performance (Mussard, 2017). For example, panels in the Andes and Himalayas regions have been found to operate at high efficiency.

Additionally, in cold climates, wind speed helps with extra cooling of the panels. However, snow cover and icing can cover the surface of the panels, reducing their efficiency. To address this issue, special technical solutions must be considered when installing panels (Mussard, 2017).

#### **Conclusion**

Solar energy is an ecologically clean and sustainable energy source that holds significant importance. Research into the climatic factors that affect the efficiency of solar panels allows for the expansion of their application areas. Solar energy is a technology of the future that plays a key role in the global energy system. The technology of solar panels is constantly evolving. New materials, such as perovskites and organic photovoltaic elements, provide opportunities to improve the efficiency of solar panels. Currently, the development of these technologies is aimed at making solar panels a primary source of energy production. As the efficiency of solar panels increases and manufacturing costs decrease, solar energy is expected to become more accessible and widespread, contributing significantly to the global transition to renewable energy. Moreover, innovations in panel design and energy storage solutions will likely further enhance the overall effectiveness and integration of solar power into existing energy systems.

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## Technical Sciences

# ТЕРЕҢ НЕЙРОНДЫҚ ЖЕЛІЛЕР НЕГІЗІНДЕ ЗАТТАР ИНТЕРНЕТІНІҢ ЖЕЛІЛІК ТРАФИГІНДЕГІ АУЫТҚУЛАРДЫ АНЫҚТАУ

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### Аннотация

Бұл мақалада зерттеу жұмысы терең нейрондық желілер әдістерін қолдана отырып, заттар интернетінің (IoT) желілік трафигіндегі ауытқуларды анықтауға бағытталған. Заттар интернеті (IoT) қазіргі заманғы цифрлық технологиялардың маңызды бөлігі болып табылады, алайда ол жиі түрлі шабуылдар мен киберқауіптерге ұшырайды. Осыған байланысты желілік трафиктегі аномалияларды уақытылы және дәл анықтау өте маңызды.

Зерттеу барысында IoT құрылғыларының желілік трафигі үшін арнайы деректер жинағы қолданылды. Терең нейрондық желілер деректерді тиімді талдау және аномалияларды дәл анықтау үшін пайдаланылды.

Зерттеудің негізгі мақсаты — желілік трафиктегі шабуылдар мен ауытқуларды анықтау дәлдігін арттыру, сонымен қатар мәліметтердің құпиялылығы мен қауіпсіздігін қамтамасыз ету. Жұмыс нәтижесінде ұсынылған модель желілік қауіпсіздікті жақсартуға және IoT құрылғыларының қауіп-қатерлерге төзімділігін арттыруға ықпал етеді.

Бұл зерттеу IoT құрылғыларының желілерінде киберқауіптерді анықтау саласындағы зерттеулерге өз үлесін қосады және желілік қауіпсіздікті күшейту үшін маңызды практикалық шешімдер ұсынады.

**Қолданылатын модельдер:** CNN + LSTM алгоритмдері арқылы қолданылған гибриді моделі, федеративті оқытудан MLP моделі.

**1-модель.** CNN + LSTM алгоритмдері арқылы қолданылған гибриді моделі.

1. CNN қабаты:

- Желілік трафик деректерінен кеңістіктік үлгілерді шығарып алу үшін қолданылады.
- Әр түрлі өлшемдегі kernel фильтрлері арқылы мәліметтерді зерттеп, маңызды ерекшеліктерді анықтайды.

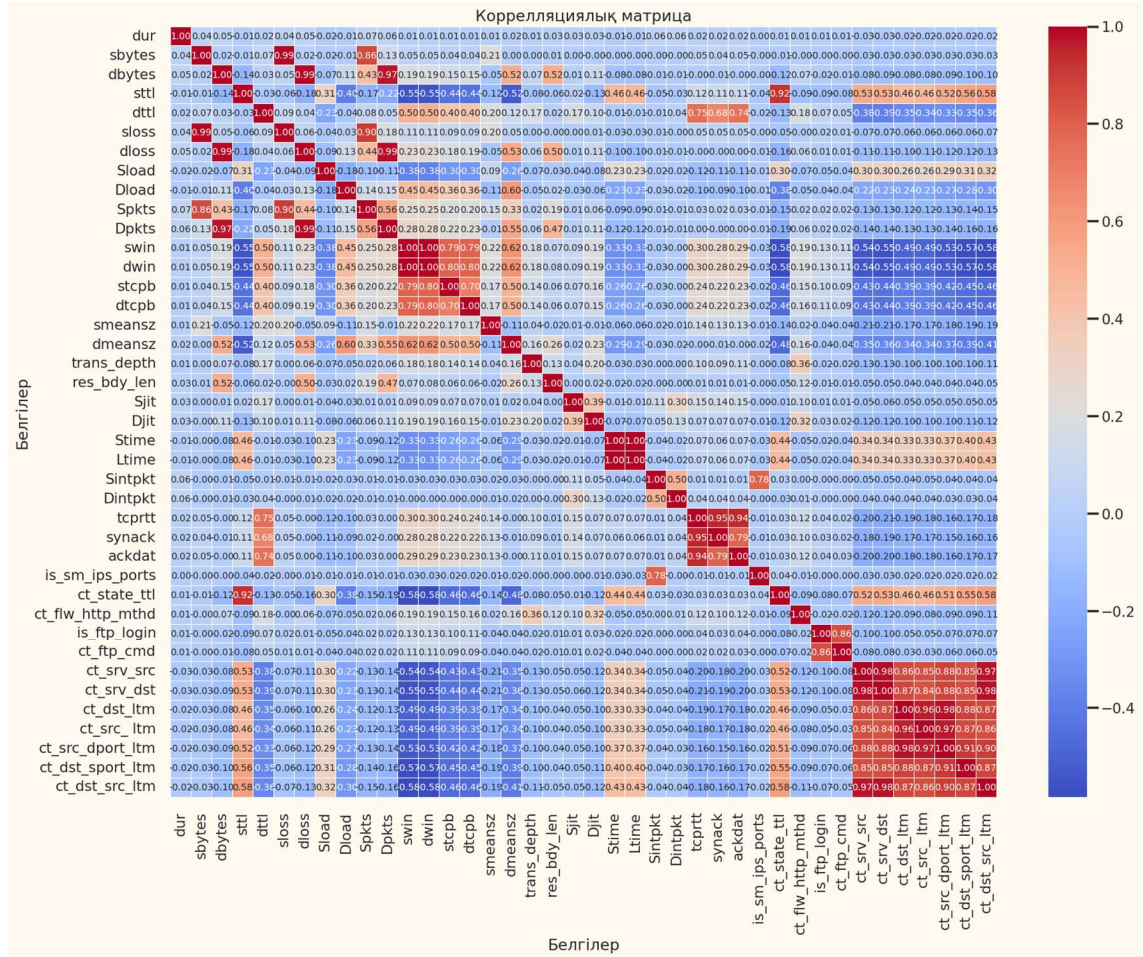
2. LSTM қабаты:

- Уақытқа тәуелді (time-series) деректерді өңдейді.
- Алдыңғы уақыт қадамдарының ақпаратын ескере отырып, желілік трафиктің уақытша мінез-құлқын түсінеді.

3. Қорытынды қабаттар:

- Fully Connected Layer (FC): CNN мен LSTM-нің ерекшеліктерін біріктіріп, классификацияны жүзеге асырады.
- Softmax немесе Sigmoid: Бинарлы немесе көп классты классификацияға арналған.

Деректердің коррелляциялық матрицасы 1-суреттер көрсетілген.



1-сурет. Деректердің коррелляциялық матрицасы

Келесіде, нейрондық желінің архитектурасы осындай түрде 2-суретте көрсетілгендей құрылады:

```

n_features = x_train.shape[1]

model = Sequential()

model.add(Conv1D(filters=6, kernel_size=1, activation='relu', input_shape=(n_features, 1), kernel_regularizer=l2(0.001)))
model.add(MaxPooling1D(pool_size=2))
model.add(BatchNormalization())
model.add(Dropout(0.6))
model.add(LSTM(units=8, return_sequences=True, kernel_regularizer=l2(0.001)))

model.add(Conv1D(filters=16, kernel_size=3, activation='relu', kernel_regularizer=l2(0.001)))
model.add(MaxPooling1D(pool_size=2))
model.add(BatchNormalization())
model.add(Dropout(0.6))

model.add(Flatten())

model.add(Dense(32, activation='relu', kernel_regularizer=l2(0.001)))
model.add(Dropout(0.6))
model.add(Dense(2, activation='softmax'))

learning_rate = 0.0001 # Taux d'apprentissage réduit
optimizer = Adam(learning_rate=learning_rate)
    
```

2-сурет. Терең нейрондық желінің архитектурасы

Құрылған модельді компиляция жүргізіп, модельді оқытып, эпоха саны анықталды және модельдің кіріс-шығыс қабаттары табылды (3-сурет).

```

3374/3374 ————— 137s 25ms/step - accuracy: 0.9811 - loss: 0.0960 - precision: 0.981
Epoch 46/50
3374/3374 ————— 147s 27ms/step - accuracy: 0.9811 - loss: 0.0948 - precision: 0.981
Epoch 47/50
3374/3374 ————— 138s 26ms/step - accuracy: 0.9812 - loss: 0.0940 - precision: 0.981
Epoch 48/50
3374/3374 ————— 147s 27ms/step - accuracy: 0.9815 - loss: 0.0921 - precision: 0.981
Epoch 49/50
3374/3374 ————— 141s 27ms/step - accuracy: 0.9814 - loss: 0.0928 - precision: 0.981
Epoch 50/50
3374/3374 ————— 84s 25ms/step - accuracy: 0.9811 - loss: 0.0913 - precision: 0.9811
Model: "sequential"

```

Layer (type)	Output Shape	Param #
conv1d (Conv1D)	(None, 55, 6)	12
max_pooling1d (MaxPooling1D)	(None, 27, 6)	0
batch_normalization (BatchNormalization)	(None, 27, 6)	24
dropout (Dropout)	(None, 27, 6)	0
lstm (LSTM)	(None, 27, 8)	480
conv1d_1 (Conv1D)	(None, 25, 16)	400
max_pooling1d_1 (MaxPooling1D)	(None, 12, 16)	0
batch_normalization_1 (BatchNormalization)	(None, 12, 16)	64
dropout_1 (Dropout)	(None, 12, 16)	0
flatten (Flatten)	(None, 192)	0
dense (Dense)	(None, 32)	6,176
dropout_2 (Dropout)	(None, 32)	0
dense_1 (Dense)	(None, 2)	66

```

Total params: 21,580 (84.30 KB)
Trainable params: 7,178 (28.04 KB)
Non-trainable params: 44 (176.00 B)
Optimizer params: 14,358 (56.09 KB)

```

3-сурет. Модельдің қабаттары және эпоха саны

Соңында, 4-суретте модельдің дәлдігі табылды. Ол 98%-ды құрады.

```

test_loss, test_accuracy, test_precision, test_recall = model.evaluate(x_test, y_test)
print(f"Loss: {test_loss * 100:.2f}%")
print(f"Accuracy: {test_accuracy * 100:.2f}%")
print(f"Precision: {test_precision * 100:.2f}%")
print(f"Recall: {test_precision * 100:.2f}%")

```

```

4217/4217 ————— 23s 6ms/step - accuracy: 0.9886 - loss: 0.0636 - precision: 0.9886 - recall: 0.9886
Loss: 6.34%
Accuracy: 98.87%

```

4-сурет. Модельдің метрикалары

**Қорытынды.** CNN + LSTM алгоритмдері арқылы қолданылған гибриді моделі, федеративті оқытудан MLP моделін оқытқан кезде дәлдік 98,87%-ды құрады, ал федеративті оқытуда қолданылған MLP моделінде дәлдік 99,15%-ды құрады. Демек, құрылған екі модель де Заттар интернетінің ауытқулығын анықтаған кезде өте жақсы көрсеткіштер алынды.

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# ФЕДЕРАТИВТІ ОҚЫТУ НЕГІЗІНДЕ ЗАТТАР ИНТЕРНЕТІНІҢ ЖЕЛІЛІК ТРАФИГІНДЕГІ АУЫТҚУЛАРДЫ АНЫҚТАУ

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## Аннотация

Бұл мақалада зерттеу жұмысы федеративті оқыту әдістерін қолдана отырып, заттар интернетінің (IoT) желілік трафигіндегі ауытқуларды анықтауға бағытталған. Заттар интернеті (IoT) қазіргі заманғы цифрлық технологиялардың маңызды бөлігі болып табылады, алайда ол жиі түрлі шабуылдар мен киберқауіптерге ұшырайды. Осыған байланысты желілік трафиктегі аномалияларды уақытылы және дәл анықтау өте маңызды.

Зерттеу барысында IoT құрылғыларының желілік трафигі үшін арнайы деректер жинағы қолданылды. Федеративті оқыту деректерді тиімді талдау және аномалияларды дәл анықтау үшін пайдаланылды. Бұл әдіс мәліметтердің құпиялылығын сақтай отырып, түрлі құрылғылар арасында модельдерді бөлісуге мүмкіндік береді.

Зерттеудің негізгі мақсаты — желілік трафиктегі шабуылдар мен ауытқуларды анықтау дәлдігін арттыру, сонымен қатар мәліметтердің құпиялылығы мен қауіпсіздігін қамтамасыз ету. Жұмыс нәтижесінде ұсынылған модель желілік қауіпсіздікті жақсартуға және IoT құрылғыларының қауіп-қатерлерге төзімділігін арттыруға ықпал етеді.

Бұл зерттеу IoT құрылғыларының желілерінде киберқауіптерді анықтау саласындағы зерттеулерге өз үлесін қосады және желілік қауіпсіздікті күшейту үшін маңызды практикалық шешімдер ұсынады.

**Қолданылатын модельдер:** MLP алгоритмдері арқылы қолданылған модель.

MLP алгоритмдері арқылы қолданылған моделі.

1. Толық байланысқан қабаттар (Dense Layers):

- Әрбір қабат (Dense Layers) толығымен байланысқан қабат.
- Модельде бірнеше қабат бар және олардың әрқайсысында сызықтық емес белсендіру функциясы (relu) қолданылады, бұл деректердегі күрделі тәуелділіктерді модельдеуге мүмкіндік береді.

2. Соңғы қабаттың белсендіру функциясы::

- Соңғы қабатта sigmoid белсендіру функциясы қолданылады, бұл бинарлы классификацияға тән, мұнда шығыс мәні 0 мен 1 аралығында болады.
- Sigmoid: Бинарлы классификацияға арналған.

3. Соңғы қабаттың белсендіру функциясы:

- шығын функциясын қолдану модельдің бинарлы классификацияға бағытталғанын растайды.



Құрылған модельді компиляция жүргізіп, модельді оқытып, раундсаны анықталды және модельдің кіріс-шығыс қабаттары табылды (3-сурет). Соңында, 4-суретте модельдің дәлдігі табылды. Ол 98%-ды құрады.

**2-модель.** Федеративті оқытуда қолданылған MLP моделі.

Федеративті оқыту – бұл деректерді орталық серверге жібермей-ақ әртүрлі құрылғыларда модельдерді оқытуға мүмкіндік беретін жаңа таралған машиналық оқыту парадигмасы. Бұл мақалада Интернет заттар (IoT) желісіндегі аномалияларды анықтауға арналған федеративті оқыту әдісіне негізделген көпқабатты перцептрон (MLP) ұсынылған. Зерттеуде RT\_IOT2022 деректер жинағы пайдаланылды. Эксперимент нәтижелері ұсынылған модельдің желілік белсенділіктердің аномалияларын анықтаудағы тиімділігін көрсетті.

```

1 def split_data(x, y, num_clients):
2     client_data = []
3     shard_size = len(x) // num_clients
4     for i in range(num_clients):
5         start = i * shard_size
6         end = start + shard_size
7         client_data.append((x[start:end], y[start:end]))
8     return client_data
9
10 # Split data for 3 clients
11 num_clients = 3
12 client_data = split_data(x_train, y_train, num_clients)
13
14

```

3-сурет. Деректерді клиенттерге бөлу

RT\_IOT2022 деректер жинағы желілік трафик деректерін қамтиды. Алдын ала өңдеу жүргізілді, аномалия белгілері шабуыл түріне қарай анықталды.

Модель үш жасырын қабаты бар MLP негізінде құрастырылған. Әрбір қабатта ReLU активация функциясы және сигмоидтық шығыс қабаты қолданылады.

```

1 def create_model():
2     model = models.Sequential([
3         layers.Dense(128, activation='relu', input_shape=(83,)),
4         layers.Dense(64, activation='relu'),
5         layers.Dense(32, activation='relu'),
6         layers.Dense(1, activation='sigmoid') # Измененный выходной слой для бинарной классификации
7     ])
8     model.compile(optimizer='adam',
9                 loss='binary_crossentropy', # Измененная функция потерь
10                metrics=['accuracy'])
11     return model

```

4-сурет. Модельді құру

```

1 # Initialize the global model
2 global_model = create_model()
3
4 # Each local model starts with the same initial weights
5 initial_weights = global_model.get_weights()

```

5-сурет. Модельді инициализациялау

```

1 # Number of rounds for federated learning
2 num_rounds = 10
3 for round_num in range(num_rounds):
4     print(f"Round {round_num + 1}/{num_rounds}")
5
6     local_weights = []
7
8     # Train on each client
9     for client_id in range(num_clients):
10        print(f"Training on client {client_id + 1}")
11
12        # Create local model and set global weights
13        local_model = create_model()
14        local_model.set_weights(global_model.get_weights())
15
16        # Get client data
17        X, y = client_data[client_id]
18
19        # Train local model
20        local_model.fit(X, y, epochs=1, batch_size=32, verbose=0)
21
22        # Collect local model weights
23        local_weights.append(local_model.get_weights())
24
25    # Federated averaging: Aggregate local weights
26    averaged_weights = [np.mean([local_weights[j][i] for j in range(num_clients)], axis=0)
27                        for i in range(len(local_weights[0]))]
28
29    # Update global model weights
30    global_model.set_weights(averaged_weights)
31
32    # Evaluate the global model
33    loss, accuracy = global_model.evaluate(X_test, y_test, verbose=0)
34    print(f"Global model accuracy after round {round_num + 1}: {accuracy:.4f}")

```

6-сурет. Федеративті оқыту алгоритмі

```

Round 1/10
Training on client 1
Training on client 2
Training on client 3
Global model accuracy after round 1: 0.9732
Round 2/10
Training on client 1
Training on client 2
Training on client 3
Global model accuracy after round 2: 0.9897
Round 3/10
Training on client 1
Training on client 2
Training on client 3
Global model accuracy after round 3: 0.9822
Round 4/10
Training on client 1
Training on client 2
Training on client 3
Global model accuracy after round 4: 0.9847
Round 5/10
Training on client 1
Training on client 2
Training on client 3
Global model accuracy after round 5: 0.9849
Round 6/10
Training on client 1
Training on client 2
Training on client 3
Global model accuracy after round 6: 0.9877

```

7-сурет. Оқыту барысындағы раундтағы көрсеткіштер

Модель федеративті ортақтастыру әдісін (Federated Averaging) пайдалана отырып оқытылды. Деректер үш клиент арасында бөлінді. Әрбір клиент жергілікті модельді оқытып, нәтижелер жаһандық модельді жаңарту үшін ортақтастырылды. Дәлдік 99,15% шықты.

```
1 global_model_parameters = global_model.get_weights()
2
3 final_model = create_model()
4 final_model.set_weights(global_model_parameters)
5 loss, accuracy = final_model.evaluate(X_test, y_test, verbose=0)
6 print(f"Final model accuracy: {accuracy:.4f}")
```

Final model accuracy: 0.9915

8-сурет. Модельдің дәлдігі

Модельді тестілеу үшін деректер қорындағы 20% ақпаратты алып тестіленді. Тестілеу нәтижесінде трафиктерді болжам және нақты деп бөлінді 11-суретте көрсетілді.

	Predicted	Actual
0	Anomaly	Anomaly
1	Anomaly	Anomaly
2	Anomaly	Anomaly
3	Anomaly	Anomaly
4	Anomaly	Anomaly
5	Anomaly	Anomaly
6	Anomaly	Anomaly
7	Normal	Normal
8	Anomaly	Anomaly
9	Anomaly	Anomaly
10	Normal	Normal
11	Anomaly	Anomaly
12	Anomaly	Anomaly
13	Anomaly	Anomaly
14	Anomaly	Anomaly
15	Anomaly	Anomaly
16	Anomaly	Anomaly
17	Anomaly	Anomaly
18	Anomaly	Anomaly
19	Anomaly	Anomaly

9-сурет. Тестілік деректерді тексеру

**Қорытынды.** Федеративті оқытудан MLP моделін оқытқан кезде дәлдік 99,15%-ды құрады. Демек, модель Заттар интернетінің ауытқулығын анықтаған кезде өте жақсы көрсеткіштер алынды

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**Аңдатпа.** Қазіргі уақытта тамақ өнеркәсібінің алдында халықтың әртүрлі топтарының дұрыс тамақтануға деген қажеттілігін қанағаттандыру міндеті тұр. Бұл мәселенің шешімі өнімнің тағамдық құндылығын және технологиялық процестің тиімділігін арттыру мақсатында жергілікті шикізатты пайдалана отырып өнімдер ассортиментін кеңейту болып саналады.

**Түйін сөздер:** бидай кебегі, жабайы жидектер, тағамдық құндылық, мұздатылған өнімдер, кондитер өнімдері.

**Аннотация.** В настоящее время перед пищевой промышленностью стоит задача удовлетворения потребности различных слоев населения в здоровом питании. Решением данной проблемы считается расширение ассортимента продукции с использованием местного сырья с целью повышения пищевой ценности продукции и эффективности технологического процесса.

**Ключевые слова:** пшеничные отруби, лесные ягоды, пищевая ценность, замороженные продукты, выпечка.

Тағамдық заттардың бірегей көздері - бидай кебегі және жабайы жидектерден өңделген өнімдер. Бидай кебегінде диеталық талшықтардың, В дәрумендерінің және табиғи антиоксиданттардың; С дәрумені мен биофлавоноидтардың едәуір мөлшері бар. Сонымен қатар, рецептураға ұқсас өсімдік шикізатын қосу қамырдың функционалды және технологиялық қасиеттерін жақсартуға көмектеседі, одан жасалған өнімдердің күрделілігін төмендетеді, пісіру шығындарын азайтады.

Дәстүрлі формулаға өсімдік шикізатының қоспалары тамақ өндірісінің технологияларында кеңінен қолданылады, бірақ сонымен бірге қоғамдық тамақтандыру

кәсіпорындары шығаратын ұн кондитерлік өнімдерінің рецептураларында жиі қолданылмайды [1-2].

Айта кету керек, өмір салты мен тағам тұтыну режимін өзгерту дәстүрлі бидай наны мен нан өнімдерін халық арасында аз танымал етеді. Бүгінгі таңда белсенді халықтың тамақтануын қалыптастыру тағамдық талшықтардың, дәрумендер мен минералдардың көбеюімен жаңа тұтынушылық қасиеттері бар, қант пен майдың аз мөлшерін тұтынуға бағытталған. Сонымен қатар, тұтынушылар жоғары органолептикалық қасиеттері бар өнімдерге артықшылық береді. Сондықтан өнімнің осы сегментінің рецептурасын жетілдіру, сапасы мен тағамдық құндылығын арттыру жолдарын іздеу өзекті болып табылады [3].

Ұннан жасалған кондитерлік өнімдерді өндірудің икемді, басқарылатын процесін құру үшін әр түрлі құрғақ кондитерлік қоспалар көбірек қолданылады. Көбінесе қамырға арналған қоспалардың құрамында табиғи талшықтар - гидроколлоидтардың, крахмал, қышқылдандырғыштар және пісіру ұнтақтарының құрамы қолданылады.

Гидроколлоидтардың болуы крахмалдың қасиеттерінің өзгеруіне байланысты мұздату, төмен температурада сақтау кезінде қамырдың тұрақтылығын арттырады. Сонымен қатар, өсімдік шикізатымен кондитерлік қоспаларды, қамырды мұздатудың одан жасалған өнімдердің сапасына әсері қамыр рецептураларында қолдану туралы ақпараттар әлі де жеткіліксіз.

Экономикалық жағдайға байланысты өнімдердің құрамындағы ингредиенттерді таңдауда отандық шикізаттарды пайдалану кәсіпорындар үшін де тиімді болып саналады.

Қазіргі уақытта ұннан жасалған кондитерлік өнімдерге арналған жартылай фабрикаттар өндірісінде мұздатылған қамырдың ассортименті кеңеюде. Мұздатылған өңделген қамырды пайдалану тұтынушылардың сұранысының тұрақтылығын қамтамасыз етеді [4].

Пісірілген жартылай фабрикаттардан алынған өнімдерді байыту үшін шикізатты қолданған жөн, оның құрамы өнімнің сапасына барынша толық және оң әсер етеді, олардың тағамдық және биологиялық құндылығын арттырады. Ал, нанның тағамдық құндылығын арттырудың ғылыми негіздерін әзірлеуге Л. Я. Ауэрман, Л.И. Пучкова сияқты шетелдік және отандық ғалымдардың қосқан үлестері өте үлкен.

Қазіргі уақытта мұздатылған өнімдерді өндіру технологиясы қарқынды дамып келеді. Бәсекелестік позицияларды нығайтуға мүдделі кәсіпорындар нан нарығының даму тенденцияларын ескереді және оларға консерванттар мен басқа химиялық заттарды қолданбай өнімді сақтаудың ең жақсы тәсілі болып табылатын мұздату технологиясын қолдануда.

Аталған бағыттан басқа мұздатылған дайын ұннан жасалған кондитерлік өнімдер өндірісі белсенді дамып келеді. Мысалы, пирогтар, түрлі жеміс-жидек қоспалары бар пирогтар. Көбінесе толтырғыштар ретінде әртүрлі конфигурациялар, дәнекерлеу, джем қолданылады. Мұндай өнімдердің тағамдық құндылығын арттыру үшін жаңа немесе жаңа мұздатылған шикізатты қолданған жөн.

Жартылай фабрикаттарды мұздату технологиясын дамыту және жетілдіру үшін мұздату процесінде олардың жылу-физикалық сипаттамаларын зерттеу үлкен маңызға ие.

Жартылай фабрикаттардың ылғалдылығы мен байытқыштардың олардың термофизикалық қасиеттері мен дайын өнімдердің сапасына әсерін тигізеді. Байытқыштарды (бидай кебегі, жабайы жидектерден өңделген өнімдер) мұздату процесінде жартылай фабрикаттағы температураның өзгеру кинетикасына енгізудің әсер етеді.

Сынақ дайындамасының ортасындағы бастапқы температурадан сұйық фазаның кристалдануы басталғанға дейінгі салқындату кезеңі: бақылау үлгісі үшін 20 мин, жабайы жидектерден өңделген өнім мен бидай кебегі бар сынама үшін - 25 мин, май қосылған жартылай фабрикат үшін - 15 мин. кристалдану кезеңі: бақылау үлгісі үшін 35 мин, жабайы

жидектерден өңделген сынама үшін және бидай кебегі үшін - 38 мин, май қосылған жартылай фабрикат үшін -30 мин. температураға дейін мұздату кезеңі (-20 °С).

Тағамдық құндылығы жоғары ұнды кондитер өнімдерін өндіру технологиясын әзірлеуде қамырдың технологиясы мен рецептурасы, одан тағамдық құндылығы жоғары өнімдерді дайындау.

Бидай талшығының құрамы мен қасиетін, қамыр рецептіндегі алмастырылатын ұнның оңтайлы мөлшерін қосу, сонымен қатар, өсімдік шикізатының қасиеттерін қамыр рецептураларында қолдану үшін негіздеу, қамыр рецептурасына өсімдік шикізатының оңтайлы мөлшерін, тағамдық құндылығы жоғары қамырдан жасалған бұйымдардың рецептуралары мен технологияларын қарастыру, жаңа өнім сапасының органолептикалық, физика - химиялық, құрылымдық - механикалық көрсеткіштерін анықтау, тағамдық құндылығы жоғары мұздатылған қамырдан жасалған бұйымдардың сапасын бағалау және қамырдан жасалған мұздатылған дайын өнімдердің технологиясы қарастырылды.

#### *Зерттеу объектілері мен әдістері*

Зерттеу нысандары – жоғары сұрыпты бидай ұны (ГОСТ 52189 2003), престелген нан пісіретін ашытқы (ГОСТ 54731-2011), ас тұзы (ГОСТ Р 51574-2018), ауыз су (СанПиН 2.1.4.1074–01), бидай кебегі (ТУ 9295-002-00932169-96), суды ауыстырумен дайындалған қамыр үлгілері, дайын өнімдер.

Нан-тоқаш өнімдерінің органолептикалық көрсеткіштері әр түрлі нұсқада дайындалған ГОСТ 27842-88 бойынша анықталады. Физика -химиялық көрсеткіштер - МЕМСТ 21094-75, МЕМСТ 5669-96 бойынша, ГОСТ 5670-96 [5].

#### *Қорытынды*

Ұсынылған зерттеулер негізінде пайдалану мүмкіндігі бидай талшығының құрамы мен қасиетін зерттеу кезінде ұнды кондитер өнімдерін өндірудің жеделдетілген технологиялары қарастырылды. Ұнды кондитер өнімдерін өндіруге арналған рецепттерін дайындауда бидай кебегі және жабайы жидектерден өңделген өнімдердің мүмкіндіктері мен перспективасы қарастырылған. Сонымен бірге өнімдерді мұздату процесі өнімдердің хош иісін күшейтуге, өнімдегі бос ылғалдың массалық үлесінің төмендеуін қамтамасыз етеді және дайын өнімнің балғындығын, сақтау ұзақтығын арттыруға мүмкіндік береді.

Кондитер өнімдерін өндірудегі өнімдердің химиялық құрамын реттеуге, олардың тағамдық құндылығын арттыруға, өнімнің ескіру процесін баяулатуға және құнды жаңа өнімдердің ассортиментін кеңейтуге мүмкіндік береді.

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# Kompüter cinayətkarlığı və kriptografiya

Əliyeva Aygün Cahangir qızı

Azərbaycan Dövlət Pedaqoji Kollecinin müəllimi

## Xülasə

**Kibercinayətkarlıq** dedikdə İnternet, yaxud başqa kompüter şəbəkələrindən istifadə olunmaqla törədilən cinayətlər nəzərdə tutulur. Kibercinayətkarların hücum obyektləri, əsasən, banklar, birjalar, İnternet-mağazalar olur. Cinayətin həyata keçirilməsində kompüterlər, yaxud şəbəkələrdən aşağıdakı kimi istifadə oluna bilər:

- Kompüter, yaxud şəbəkə cinayət aləti ola bilər, başqa sözlə, cinayətin həyata keçirilməsində onlardan istifadə oluna bilər.
- Kompüter, yaxud şəbəkə cinayətin hədəfi (“qurbanı”) ola bilər.
- Kompüter, yaxud şəbəkə cinayət məqsədlərinə çatmaq üçün yardımçı vasitə ola bilər.

## Summary

Cybercrime refers to crimes committed using the Internet or other computer networks. The objects of attack of cybercriminals are mainly banks, stock exchanges, and online stores. Computers or networks can be used in the commission of a crime in the following ways:

- A computer or network can be an instrument of crime, in other words, they can be used in the commission of a crime.
- A computer or network can be the target (“victim”) of a crime.
- A computer or network can be an auxiliary tool for achieving criminal goals.

## Резюме

Киберпреступность – это преступления, совершенные с использованием Интернета или других компьютерных сетей. Объектами атак киберпреступников в основном являются банки, биржи и интернет-магазины. Компьютеры или сети могут использоваться при совершении преступления следующим образом:

- Компьютер или сеть могут быть инструментом преступления, иными словами, они могут быть использованы при совершении преступления.
- Компьютер или сеть могут стать целью («жертвой») преступления.
- Компьютер или сеть могут помочь в достижении преступных целей.

**Açar sözlər:** Kompüter cinayətkarlığı, Hakerlər, Senari uşağı, Crekerlər

**Keywords:** Computer crime, Hackers, Scenario child, Crackers

**Ключевые слова:** Компьютерные преступления, Хакеры, Скрипт детский, Взломщики

- **Hakerlər — çarqınçılar.** «Haker» termini ötən əsrin 50-ci illərində Massachusetts Texnologiya İnstitutunda (ABŞ) meydana çıxmışdır. Həmin dövrün gəncləri arasında hətta müəyyən haker mədəniyyəti də yaranmışdır. Bu mədəniyyət dostlar arasında proqramların açıq mübadiləsi prinsipinə əsaslanırdı. O zamanlar bu söz hörmətlə çəkilirdi. Əməliyyat sisteminin daha yaxşı işləməsi üçün onun nüvəsinin bir hissəsini yenidən yazan, yaxud hamının unutduğu inzibatçı

parolunu "ləğv edən" kompüter dahilərini belə adlandırırdılar. Qeyri-standart düşünmə qabiliyyətlərinə və ən mürəkkəb problemlərin ağıllı həllini tapdıqlarına görə bu onlara hörmət əlaməti idi.

- 1980-ci illərdə fərdi kompüterlərin yaranması və kompüter şəbəkələrinin genişlənməsi ilə bu termin mənfi çalar qazandı: özgəsinin kompüterinə və şəbəkəsinə gizli girərək orada saxlanılan proqramlara və verilənlərə baxan, hətta onların "içinə girən" şəxslər haker adlandırıldı (yeri gəlmişkən, belə insanları "ev yaran oğru" adlandırmaq daha doğru olardı). Təkcə proqramlaşdırma ilə kifayətlənməyən, həm də əməliyyat sistemlərinin və proqramların necə işlədiyini öyrənmək üçün onları "hissə-hissə sökən" həvəskarlar da haker deyilir.
- 
- **"Haker"** termininin öz mənasını itirdiyini görən kompüter ictimaiyyəti əlavə terminlər (məsələn: "script kiddie" və "cracker") daxil etdilər. **"Ssenari uşağı"** (ingiliscə: script kiddie) termini ilə hakerlik sahəsində o qədər də biliyi olmayan və "sındırmaq" üçün digər hakerlərin utilitlərindən istifadə edən adamları adlandırırlar. **Kreker** (ingiliscə: cracker) isə bilik səviyyəsinə görə "script kiddie" ilə haker arasında olan şəxsə deyilir. O, proqramların üzünün çıxarılmaması üçün qoyulmuş müdafiəni "sındıra" bilir, ancaq proqramda yeni zəif yerlər tapmaq, yaxud haker utilitləri yazmaq üçün onun biliyi kifayət etmir.
- Proqram məhsulunun alıcısı, əslində, yalnız həmin proqramın istifadə hüququnu əldə edir. Proqramın özü isə onun mülkiyyətinə keçmir. Ona görə də proqram məhsulunun üzünün çıxarılıb yayılması qanun pozuntusu hesab olunur. Belə hərəkətlərə kompüter piratçılığı, yaxud proqram təminatı piratçılığı deyilir
- **Kriptoqrafiya** yunan dilindəki Κρυπτός (gizli) və Γραφος (yazı) sözlərinin birləşməsindən meydana gəlir və hər hansı bir informasiyanın konfidensiallığını (və ya başqa sözlə, məxfiliyini) təmin etmək üçün istifadə olunur. Kriptoqrafiya məlumatın şifrlənməsini nəzərdə tutur. Şifrlənmiş məlumat yalnız açıq mətni oxumaq hüququ olan istifadəçi tərəfindən deşifrlənə bilər. Şifrləmə məlumatın təhlükəsizliyinə tam zəmanət vermir, amma onun icazəsiz istifadəsini dəfələrlə məhdudlaşdırır. Bu mətni deşifrləyib oxumaq üçün açar sözünü və şifrləmə alqoritmini bilmək lazımdır. Şifrlənəcək mətn açıq mətn adlanır, bu mətn şifrləmə açarından istifadə etməklə şifrləmə alqoritm vasitəsilə şifrlənir. İlk kriptoqrafik yazılar eranın əvvəlində meydana çıxmışdır. Qədim Misir əlyazmalarında dini mətnlər və tibbi reseptlər qeyri-standart heroqliflərlə şifrlənirdi. Çinli alim Sun Tzu "Hərb sənəti" kitabında kəşfiyyat və əks-kəşfiyyatın əsas prinsiplərini, həmçinin şifrlənmiş məlumatların işlənməsi və qorunması metodlarını formalaşdırırdı. Roma imperatoru Yuli Sezar da öz yazışmalarında indi onun adını daşıyan "Sezar şifri"ndən istifadə edirdi. Müasir latın əlifbasına tətbiq etdikdə bu şifr aşağıdakından ibarət idi - əvvəlcə adi əlifba yazılırdı, sonra onun altına üç hərf sola sürüşdürülmüş eyni əlifba əlavə edilirdi:

ABCDEFGHIJKLMNOPQRSTUVWXYZ DEFHGIJKLMNOPQRSTUVWXYZABC

Beləliklə, şifrləmə zamanı A hərfi D hərfi ilə, B hərfi E hərfi ilə və s. əvəz olunurdu. Məsələn, VENI VIDI VICI (gəldim, gördüm, qələbə çaldım) sətiri şifrləmə zamanı YHQL YLGL YLFL sətirinə çevrilirdi. Şifrlənmiş məlumatı alan şəxs hərfləri ikinci sətirdə axtarırdı və onların üstündəki hərflərə görə əsas mətni bərpa edirdi. Birinci Dünya müharibəsi dövründə kriptoqrafiya artıq qəbul edilmiş bir döyüş vasitəsinə çevrildi. Belə ki, alman səfiri Artur Zimmermanın teleqramının ABŞ xüsusi xidmət orqanları tərəfindən ələ keçirilməsi ABŞ-ın müttəfiqlərin tərəfində müharibəyə girməsinə səbəb oldu. İkinci Dünya müharibəsində isə kriptoqrafiya kompüter sistemlərinin inkişafı üçün bir növ katalizator oldu. İstifadə olunan şifrlər (almanlarda "Enigma", ingilislərdə "Turing Bombe") kriptoqrafiyanın həyati əhəmiyyətini açıq şəkildə ortaya qoydu. İnternetin inkişafı isə kriptoqrafiyanı yeni səviyyəyə qaldırdı. Kriptoqrafik metodlar elektron ticarət əməliyyatlarında, telekommunikasiya və digər sahələrdə geniş istifadə olunmağa başladı. Bunlar arasında ən çox

populyarlıq qazanan isə 2009-cu ildə Satoşi Nakomoto tərəfindən yaradılan kriptovalyuta - bitkoin oldu. Kriptoqrafiyada şifrləmənin 2 əsas üsulu var: simmetrik və asimmetrik. Simmetrik şifrləmə üsulunda eyni açar (gizli açar) həm məlumatı şifrləmək, həm də deşifrləmək üçün istifadə olunur. Asimmetrik şifrləmə üsulunda isə iki açıardan istifadə olunur. Onlardan biri açıq açar şifrləmə üçün istifadə olunur, digəri gizli açar isə deşifrləmə üçün istifadə olunur. **Müasir** kriptoqrafiyanın predmeti **informasiyanı** bədniyyətlinin müəyyən əməllərindən mühafizə etmək üçün istifadə edilən **informasiya** çevirmələridir. Kriptoqrafiya konfidensiallığı, bütövlüyə nəzarəti, autentikasiyanı və müəlliflikdən imtinanın qeyri-mümkünlüyünü təmin etmək üçün tətbiq edilir.

Kriptoqrafiyanın yaşını heç kim bilmir, lakin kriptoqrafiya — "gizli yazı" mənasına görə də güman etmək olar ki, yazı ilə həmyaşdır, onunla bir vaxtda meydana gəlmişdir. Yazı təxminən e.ə. 3300-cü ildə Şumerdə, e.ə. 3000-ci ildə **Misirdə**, e.ə. 2000-ci ildə **Çində** yaranmışdır. Qədim Misir əlyazmalarında dini mətnlər və tibbi reseptlər qeyri-standart heroqliflərlə şifrlənirdi. Qədim sivilizasiyaların günümüzə gəlib çatmış tarixi sənədlərində şifrlənmiş məktubun tərtib edilməsi sistemləri və üsulları haqqında məlumatlar var.

İlk kriptosistemlər artıq bizim eramın əvvəlində meydana çıxır. Məsələn, məşhur **Roma** sərkərdəsi **Yuli Sezar** (e.ə. 100–44-cü illər) öz yazışmalarında indi onun adını daşıyan **şifrdən** istifadə edirdi. Şifrləmə proseduru adətən müəyyən kriptoqrafik alqoritmədən və açıqdan istifadəni nəzərdə tutur. **Kriptoqrafik alqoritm** – məlumatların çevrilməsinin müəyyən üsuludur. Açar isə çevirmə üsulunu konkretləşdirir. Müasir kriptoqrafiya o prinsiplərdən çıxış edir ki, kriptoqrafik çevirmənin məxfiliyi yalnız açarın məxfi saxlanması ilə təmin edilməlidir.

**Rəqəmsal imza** alqoritmlərində isə gizli açar şifrləmə, açıq açar deşifrləmə üçün istifadə edilir. Çünki açıq açara görə uyğun gizli açarın tapılması çox böyük həcmdə hesablamalar tələb edir. Hesablama texnikasının hazırkı inkişaf səviyyəsində isə bu məsələ qeyri-mümkün hesab olunur.

**Müəlliflik hüququ.** İnformasiya-kommunikasiya texnologiyalarının dinamik inkişafı və kompüterlərin çox sürətlə insanların həyatına daxil olması ilk çağlar qanunvericilərin buna hazır olmadığını göstərdi. Bir müddət kompüter proqramlarının hüquqi müdafiəsi məsələsi açıq qaldı, ancaq getdikcə bu boşluqlar doldurulmağa başlandı. Belə ki, hazırda kompüter proqramları (kompilyatorlar, redaktorlar, verilənlər bazası və s.) əmtəə məhsulu statusu almışdır və onlar da intellektual mülkiyyət kimi qorunur.

Kompüter proqramlarının müəlliflik hüququnun tanınması üçün onların hər hansı qurumda qeydiyyatdan keçirilməsi vacib deyil. Proqrama müəlliflik hüququ avtomatik olaraq onun yaradılması zamanı meydana çıxır. Proqramın yaradıcısı öz hüquqlarını elan etmək üçün proqramın ilk buraxılışında üç elementdən ibarət olan müəlliflik hüququnun qorunması işarəsindən istifadə edə bilər:

evrənin içərisində, yaxud mötərizədə "C" hərfi — ©, ©;

hüquq sahibinin adı;

proqramın ilk buraxılış ili.

Məsələn, Word mətn redaktoruna müəlliflik hüququnun qorunması işarəsi belə göstərilir:

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Proqramın müəllifi öz proqramını istənilən yolla çoxaltmaq və yaymaq, eləcə də dəyişdirmək üçün müstəsna hüquqa malikdir. Proqramın nüsxəsinə qanuni yolla sahib olmuş qurum, yaxud istifadəçi proqramın işləməsi üçün istənilən hərəkəti edə, o cümlədən onu kompüterin yaddaşına yazmağa və saxlaya bilər. Bununla belə, lisenziyalı proqram təminatının gizli olaraq üzünün çıxarılması və istifadəsini qadağan edən qanunları bilmək və onlara əməl etmək lazımdır. Proqramın sahibi onun müəlliflik hüququnu pozan qurumlara, yaxud istifadəçilərə qarşı məhkəmə iddiası qaldıra və ona dəymiş ziyanın ödənilməsini tələb edə bilər.

**Müəlliflik hüququ baxımından proqram təminatını bir neçə kateqoriyaya ayırırlar:**

1. İctimaiyyətə məxsus proqram təminatı (ingiliscə: public-domain software) — müəlliflik hüququ ilə qorunmayan və sərbəst olaraq üzü köçürülə bilən proqram təminatı. Bu termin bəzən yanlış olaraq üzü sərbəst köçürülə bilən başqa növ proqram təminatına da (məsələn: ödənişsiz proqram təminatı) aid edilir.
2. Şərti ödənişsiz proqram təminatı (ingiliscə: shareware) — müəlliflik hüququ qorunan və pulsuz yayılan, ancaq, adətən, qeydiyyatdan keçmək və sənədləri, proqramı yeniləməyə gərəkli olan məsrəflərin yerini doldurmaq üçün məhsuldan razı qalan istifadəçilər tərəfindən dəyəri ödənilən proqram təminatı.
3. Ödənişsiz proqram təminatı (ingiliscə: freeware) — ilkin kodu da daxil olmaqla ödənişsiz yayılan proqram təminatı; çox zaman onlar informasiya sistemləri və ya istifadəçi qrupları tərəfindən yayılır. Azad proqram gəlişdiricisi öz məhsulunu ya mənəvi məmnunluq üçün, ya da maraqlı müştərilər arasında məhsulun hansı uğurla istifadə olunduğunu aydınlaşdırmaq üçün ödənişsiz təklif edə bilər. Belə proqramların istifadəsinə, dəyişdirilməsinə və yayılmasına heç bir məhdudiyət qoyulmur, yeganə tələb ondan ibarətdir ki, bütün dəyişikliklər aydın qeyd olunsun, müəllifin adı və müəlliflik hüququ haqqında bildiriş isə heç bir halda silinməsin və ya dəyişdirilməsin.
4. Özəl proqram təminatı (ingiliscə: proprietary software) — müəlliflərin, yaxud qanuni sahibinin xüsusi mülkiyyəti olan və sərbəst proqram təminatı meyarlarına uyğun gəlməyən (proqram kodunun açıq olması yetərli deyil) proqram təminatı. Özəl proqram təminatının hüquqi sahibi onu istifadə edə, üzünü köçürdə və tam, yaxud qismən dəyişdirə bilər. Adətən, sərbəst olmayan istənilən proqram təminatını, o cümlədən yarım sərbəst proqram təminatını özəl adlandırırlar. Özəl proqram təminatı ticari proqram təminatı ilə bağlı deyil.
5. Ticari proqram təminatı (ingiliscə: commercial software) — gəlir əldə etmək məqsədilə yaradılmış proqram təminatı. İnsanların çoxu ticari və ödənişsiz proqram təminatını bir-birinin əksi hesab edir. Ancaq ödənişsiz proqram təminatı müəyyən şəraitdə həm də ticari məhsula çevrilə bilər. Belə ki, ödənişsiz proqram təminatının sahibi başqalarına onun məhsulunu dəyişdirməyə, yaymağa və gəlir əldə etməyə icazə verir. Ödənişsiz proqram təminatının əksi özəl proqram təminatıdır. Bu proqram təminatı da həm ticari, həm də ödənişsiz proqram təminatı ola bilər. Proqramların yazılması üçün işlərin dəyəri sifarişçi tərəfindən ödənilən ticari proqramlar da vardır. Ticari məhsullara xas olan bütün üstünlüklər çox zaman belə proqramlarda olmur, çünki onların məhdud büdcəsi olur, ancaq sifarişçinin tələbləri daha yaxşı ödənilir.

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# RƏQƏMSAL TRANSFORMASIYA

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## Abstract

*Super smart society: It refers to the whole of smart urbanization with its economic development structure, which includes all human and environmental based improvements such as education, health, daily life, safe city formations. It covers a wide range of city/human model that enables objects to connect with people and living things, reflects the intelligent and technological architectural formation and provides the cycle of many communications such as big data and artificial intelligence. Economic and social new learning, such as learning types developed using artificial intelligence technology, digital identity integrations and some digital culture practices, are seen as the main factors that make the processes of reaching a super smart society. This relationship of needs, which creates cultural transformations and new economic models, creates new living standards and breakthroughs such as planned thinking strategies for the future.*

**Keywords:** Digital Culture, Artificial Intelligence, Surveillance, New World Designs, Transformation, Digitization

## Xülasə

*Super ağıllı cəmiyyət: təhsil, səhiyyə, gündəlik həyat, təhlükəsiz şəhər quruluşları kimi bütün insan və ətraf mühitə əsaslanan təkmilləşdirmələri özündə birləşdirən iqtisadi inkişaf strukturu ilə bütün ağıllı urbanizasiyaya aiddir. O, obyektlərin insanlar və canlılarla əlaqə yaratmasına imkan verən, ağıllı və texnoloji memarlıq formalaşmasını əks etdirən, böyük verilənlər və süni intellekt kimi bir çox kommunikasiyanın dövrəsini təmin edən geniş şəhər insanı modelini əhatə edir. Süni intellekt texnologiyasından istifadə edərək inkişaf etdirilən öyrənmə növləri, rəqəmsal şəxsiyyət inteqrasiyaları və bəzi rəqəmsal mədəniyyət təcrübələri kimi iqtisadi və sosial yeni öyrənmə, super ağıllı cəmiyyətə çatma proseslərini şərtləndirən əsas amillər olaraq görülür. Mədəni transformasiyalar və yeni iqtisadi modellər yaradan bu ehtiyaclar əlaqəsi gələcək üçün planlaşdırılmış düşünmə strategiyaları kimi yeni həyat standartları və irəliləyişlər yaradır.*

**Açar sözlər:** Rəqəmsal Mədəniyyət, Süni İntellekt, Nəzarət, Yeni Dünya Dizaynları, Transformasiya, Rəqəmsallaşma

Yeni texnologiyaların reallaşması və yeni həyat standartlarının ortaya çıxması ilə mədəniyyət və təəssüratlar xeyli mürəkkəbləşə bilər. Çünki mədəniyyəti müəyyən etmək üçün izlənən mədəni kodlar, simvollar və ya fərdin dəyər strukturlarının formalaşmasındakı proses davamlı bir prosesdir. Rəqəmsal mədəniyyətin xətləri xüsusilə texnologiyanın inkişafı və həyatın bütün sahələrinə daxil edilməsi ilə aydınlaşır. Sosial həyat tərzini, istifadə olunan alətlər, ünsiyyət üsulları, ictimai məkanlar, sağlamlıq, idman, təhsil və s. bir çox sahələrin xüsusiyyətləri daxilində ortaya çıxır. Rəqəmsallaşma bu sahələrin hər birində yer tapmaqla mədəniyyəti yenidən formalaşdırır. Rəqəmsallaşma yeni mədəni istehsallar baxımından çox vacibdir. Rəqəmsal mədəniyyətdə təkrarlanan sənət və heç vaxt mövcud olmayan yeni mədəni məkanlar tikilə bilər. Bu rəqəmsal mədəniyyəti ənənəvi mədəniyyətdən fərqləndirən ən böyük xüsusiyyətə çevirir.

Rəqəmsal mədəniyyətin konturlarını müəyyən etməyə çalışarkən rəqəmsalın nə olduğunu müəyyən etmək lazımdır. Rəqəmsal anlayış hər şeyin 1 və 0-dan ibarət olduğu rəqəmsal kod anlayışı kimi ortaya çıxır. Bu bizə məlumatları elektron şəkildə ekranda göstərməyə imkan verir. 1945-ci ildə ilk kompüterin ixtirası ilə başlayan bu rəqəmsallaşma, sosial informasiya və kommunikasiya çağını yaşamaq üçün ilk addım idi. Mətbəənin ixtirası ilə modernləşmə prosesi, sürətli və zəngin kanallardan istifadə, yeni media prosesi ideologiyaların kütlələrə çıxışını və

qarşılıqlı əlaqəsini təmin edərək yeni imic yaratdı. Digər tərəfdən, kompüter yeni istehsal və simvollar da yaratdı. Bu kontekstdə yeni həyat təzləri, seriallar, oyunlar, bədii media, məkan transformasiyası, virtual məkanlar kimi bir çox element rəqəmsal mədəniyyətin yaratdığı kodları təşkil edir. Dünya cəmiyyətləri daim dəyişir və yeni həyat standartları rəqəmsallaşma ilə yeni mədəni təcrübələr yaradır.

İnternetin inkişafı texnoloji tərəqqi ilə bu dövrdə də yüksək səviyyəli istifadə şəbəkəsi yaradır. Texnoloji yeniliklərlə hazırlanmış alqoritmlər fərdi məlumat təhlili ilə istehsal və istehlak prosesində unikal yeni xüsusiyyətə malikdir. Rəqəmsal əsrdə internetin struktur xüsusiyyəti mədəni kodları müəyyən edir və qlobal mədəni əlaqənin əsas xüsusiyyətini təşkil edir. Süni intellektlə inkişaf etdirilən robot texnologiyaları bu dövrdə qeyri-məhdud məlumat və davamlı innovasiyaların əhəmiyyət qazandığı və çevrildiyi rəqəmsal mədəniyyət yaradır. Texnologiyanın davamlı inkişafı və onun gətirdiyi yeniliklər cəmiyyətin mədəni dəyişməsinə sürətləndirir.

Rəqəmsal mədəniyyət bir çox xüsusiyyətlərə malik ola bilsə də, Van Dijk yeddi əsas xüsusiyyəti vurğuladı. Bunlar;

1. Əvvəlcədən proqramlaşdırma və yaradıcılıq
2. Fraqmentasiya
3. Yenidən yığma: Kolaj
4. İstifadəçi istehsalı
5. Sürətlənmə
6. Vizuallaşdırma
7. Kəmiyyətləşdirmə (Dijk, 2018: 294-307).

Rəqəmsallaşma prosesi ənənəvi cəmiyyətlərdən fərqli olaraq, yeni istehsal və maraq sahələri yaradıb, eləcə də mövcud sahələrin fəaliyyətini dəyişib. Rəqəmsal mediada fərdin hazırladığı istehsal, sənət, məhsul kimi obyektlər əvvəlcədən proqramlaşdırılmış alətlərlə yaradılır. Bu qismən avtomatik proqramlar istehsalın formalaşmasına dəstəkləyici təsir göstərsə də, fərd özünün mədəni toplanması nəticəsində bu sahələrdə öz istehsalını yaradır. Beləliklə, istehsal fazasında karbamid-istehlakçı vəziyyəti yaranır. Parçalanmanın başlığında olan isə məzmunun, videoların, yayımların kəsilərək bəzilərinin və ya hamısının müxtəlif adamlarla, düşüncələrlə alınaraq yenidən istehsalda girməsidir. Bu çoxalma prosesi ilə fərd öz kollajını yaradır. Bu istehsal prosesində ixtisaslaşma da istifadəçinin yaradılması ilə bağlıdır. Van Dijk-ə görə, rəqəmsallaşma istifadəçilərin məzmun istehsalı, video və fotoşəkillərin çəkilməsi, nəşrlərin nəşri kimi bədii əsərlər istehsal etmələrini asanlaşdırır. Digər bir mövzu, akselerasiya rəqəmsal medianın informasiya istehsalı və rabitə siqnallarının yayılması və istehlakının artmasıdır. Sürət anlayışı rəqəmsal mədəniyyətdə də çox əhəmiyyətlidir. Sürət rəqəmsal mədəniyyətdə bir zərurət olaraq görülür. Kapitalizm motivi və istehlakda dəb anlayışı da sürətdir. Sürətləndirmə həm də məlumatın həddindən artıq yüklənməsini həyata keçirir. Vizuallaşdırma başlığında ekranlar ön plandadır. Şəxslər mobil telefonlardakı məzmunu davamlı ekranda baxır və rəqəmsal mədəniyyətdə şəkillərə, fotolara və videolara maraq yüksəkdir. Bu vəziyyətin bir çox səbəbi olduğu üçün fərdi nəzarətin psixoloji yansımaları kimi də oxumaq olar. Nəhayət, kəmiyyət başlığı altında Van Dijk yeni media məzmunlarının keyfiyyət və kəmiyyətindən danışır. Rəqəmsal mədəniyyət məlumatların əks olunmasına diqqət çəkir. Bu baxımdan sürətli məlumat yüklənməsi baş verir.

Bu vəziyyətin həm müsbət, həm də mənfi nəticələri var. İnformasiyanın yüklənməsi informasiya çeşidini artırır, axtarış sistemləri və resurslar sayəsində lazımi məlumatlara çatmağı asanlaşdırır, eyni zamanda, yalan məlumatların dövriyyəsi böyük çətinlik yaradır. Bunun həlli seçmə qavrayış və idrak kimi göstərilir. Məlumatın müəyyən bir hissəsi diqqətdən kənar qala bilər. Bu kontekstdə rəqəmsal mədəniyyətdə fərd informasiya prosesində düzgün addımları müəyyən edərsə, istəyinə çata bilər, lakin məlumatı düzgün təhlil etməzsə, uzaqlaşar.

Son zamanlar rəqəmsal mədəniyyətlə bağlı araşdırmaları ilə adından söz etdirən Mark Prenski üçün rəqəmsal texnologiyaların istifadəsi ilə rəqəmsal informasiya dövrünə qədəm

qoyulub və bu rəqəmsal informasiya dövründə texnologiyadan şüurlu istifadə rəqəmsal müdrikiyə səbəb olur. Simulyasiya ilə öyrənmə metodu buna misal ola bilər. Sürətli öyrənmə prosesi hiperreallıqla yeni təcrübə verir. Rəqəmsal informasiya əsrində rəqəmsal texnologiyalardan istifadə rəqəmsal müdrikiyə gedən prosesin ilk addımını təşkil edir.

Rəqəmsal informasiya əsrində insanın texnologiyadan istifadə etdiyi və texnologiya ilə düşünərək mövcud olduğu bir vəziyyət var. Rəqəmsal informasiya əsrində doğulan insanlara rəqəmsal yerlilər deyilir. Rəqəmsal immiqrantlar isə bu keçid prosesini yaşayan seqmenti təmsil edirlər. Texnologiyanın istifadəsində çox üstünlük təşkil edən və gündəlik həyatlarını texnologiya oxu ilə hərəkət etdirən rəqəmsal yerlilər, informasiya cəmiyyətində çox zəngin qaynaqlara sahib olduqları və texnologiyadan çox yaxşı istifadə edə bildikləri üçün rəqəmsal mühacirlərdən də fərqlənilirlər. Ancaq rəqəmsal müdrik olmaq üçün rəqəmsal doğma olmaq öhdəliyi yoxdur. Başqa sözlə, Presnkinin fikrincə, rəqəmsal texnologiyalar da həyatı mürəkkəbləşdirir. İnformasiya bolluğu bu mürəkkəb prosesi yaradan əsas amillərdən biridir. Bu səbəbdən texnologiyadan köməkçi kimi istifadə etmək qaçınılmazdır (Prensky, 2009).

Bu istiqamətdə rəqəmsal informasiya əsrində fərd rəqəmsal doğma və ya rəqəmsal mühacir olaraq texnologiyadan öyrənmə prosesində effektiv və düzgün istifadə edə bilsə, hikmətə çata bilər. Texnologiya burada vasitəçi qüvvədir. Beləliklə, rəqəmsal yerlilər və rəqəmsal immiqrantlar anlayışı fərd və texnologiya arasındakı əlaqəni təyin edən anlayışlar kimi yer alır. Zamanın axıcılığı ilə rəqəmsal immiqrantlar öz yerlərini tamamilə rəqəmsal yerlilərə buraxacaqlar.

Rəqəmsal mədəniyyətin tədqiqi Jean Baudrilyard-ın real və qeyri-realın iç-içə olduğu simulakra və simulyasiya anlayışları ilə diqqəti cəlb edir. Simulyasiya, simulyator və hiperreallıq anlayışları rəqəmsal mədəniyyətin paradigmalarını təşkil edən başqa bir konsepsiya növüdür. Rəqəmsal mədəniyyətdə reallıq anlayışı da dəyişir. Reallığın virtual ölçüsü onu başa düşməyi çətinləşdirir. Baudrilyarda görə simulakra reallıq kimi qəbul edilmək istəyən baxışı simvollaşdırır.

Simulyasiya, digər tərəfdən, qurulmuş reallığın bir növüdür. “Modellər vasitəsilə reallığın əldə edilməsinə hiperreal, yəni simulyasiya deyilir” (Baudrillard, 2011: 14). Simulakra və simulyasiyalar həyatı əhatə etdi və reallıq haqqında yeni bir qavrayış yaratdı. Bu reallıq “olmuş kimi görünmək” deyil, təqlid və təqliddən kənar reallıqla təqlid arasındakı mənanın yoxa çıxmasıdır.

Baudrilyarda görə simulakralar üç qrupa bölünür; təbii simulakra, generativ simulakra və simulyasiya simulyatoru. Birinci qrupdakı təbii simulyatorlar ahəngdar və nikbin rol oynayır. Burada utopiya yaradan bir təxəyyül var. Bu baxımdan onlar imitasiya simulyatorudur. İkinci qrupdakı simulyakrların növü generativ simulyatorlardır. Onun daim böyüyən və maşınla əlaqəli yayılması var. Onlar utopik simulakralardır və məhsuldarlıq nümayiş etdirirlər. Üçüncü qrupdakı simulyatorlar hiperreallıq fantastikasını ilə hazırlanmış simulyator simulyatorlarıdır. Oyunları və nəzarəti hədəfləyən struktur yaradır (Baudrillard, 2011: 168-169).

Rəqəmsal əsrdə hər kəs daim böyük dataya əlavələr edir. Yeni media nəticəsində “istehlakçı” funksiyası görünür, yəni fərd istehsalçı-istehlakçı ola bilər. Məlumat istehlak olunduqca, onu da təkrarlamaq olar. Şəxsi bloq səhifələri, sosial media hesabları, Youtube kanalları kimi bir çox sahədə bu vəziyyətin reallaşmasında təsirli olur. Bu baxımdan, böyük verilənlərə daim artan və rəqəmsal saxlama yerini daim artıran bir həcm lazımdır. Xüsusilə smartfonlarda, davamlı olaraq baxılan videolar, paylaşılan şəkillər, axtarışlar, sosial media bəyənmələri, oxunan qəzet və ya jurnallar, mesajlar, şərhlər və s. Bir çox sahələrdə fərdlər özlərini və fikirlərini böyük dataya köçürür. Şüurlu və şüursuz bütün bu hərəkətlər böyük datada toplanır.

Cəmiyyət davamlı transformasiyada olduğundan, bəlkə də yaxın gələcəkdə xəbər aparıcısına ehtiyac qalmayacaq. Ümumiyyətlə, böyük verilənlərin və süni intellektin sosial biliklərin mənimsənilməsi və onun şəxsiyyətə çatdırılması prosesini əhatə etdiyini görürük. Böyük verilənlərdən dövlətlər, xəbər saytları, sosial media kanalları kimi kommersiya təşkilatları, həmçinin hakerlər, cinayət təşkilatları və s. elementlərdən istifadə etmək və əldə etmək olar. Hər iki nöqtədə fərdin şəxsi məlumatlarının istifadəsi və saxlanması bəzi etik problemlərə səbəb ola

bilər. Xüsusilə azadlıq və məxfilik elementləri pozula bilər , böyük məlumat və süni intellekt təhlükəli ola bilər.

Müasir kompüterin inkişafı ilə süni intellekt tədqiqatları hələ də davam edən bir prosesi əhatə edir. Ümumiyyətlə, süni intellekt insan intellekti kimi qavramaq, qərar vermək, öyrənmək və s. üçün istifadə edilə bilər. Alqoritmlər, süni neyron şəbəkələri və maşın öyrənməsi kimi texnikalara ümumiyyətlə süni intellekt texnologiyaları deyilir. Süni intellekt texnologiyası xüsusilə son illərdə həyata sürətlə daxil olub və zərurətə çevrilib. Gündəlik həyatda tez-tez istifadə edilən süni zəka nümunələrindən biri olan Google Xəritə şəxsə ən sürətli marşrutu və onun ətrafını görməyə kömək edir. Üz aşkarlama və identifikasiya sistemlərində istifadə edildikdə dövlətlər üçün nəzarət və təhlükəsizlik elementləri təmin edilməkdədir. Digər tərəfdən, üz tanıma sistemi və təhlükəsizlik kilidi olan ağıllı telefonlar və s. əməliyyatlar təmin edilir. İnternetdə axtarış və tövsiyə alqoritmləri təklif edir. Çatbotlarla bir çox təşkilat müştəri məmnuniyyətini artırmağı hədəfləyir. Sosial media kanallarında da süni intellektdən istifadə edilir. Məsələn, paylaşılan şəkil avtomatik olaraq üz tanıma funksiyası ilə etikətlənə bilər və onun paylaşımı rəqəmsal dillərlə aşkarlana və idarə oluna bilər. Elektron ödəniş sistemlərini də təmin edən süni intellekt, istifadəçi haqqında məlumatlara sahib olduğu üçün şübhəli əməliyyatları da aşkar etmək qabiliyyətinə malikdir (Engin, 2020).

Yaşanan inkişafalara qarşı cəmiyyətin münasibət və davranışlarını anlamaq üçün rəqəmsallaşmanın tarixi prosesi və texnologiyası və mədəniyyətə təsiri qaynaqlar və mütəfəkkirlər oxunda müəyyən edilmişdir. Müvafiq olaraq, araşdırma çərçivəsində sosial rəqəmsal mədəniyyətin formalaşdığı və mədəniyyətin rəqəmsallaşma ilə bəzi dəyişikliklərə və çevrilmələrə məruz qaldığı başa düşüldü. Rəqəmsal mədəniyyətin konturları müxtəlif mənbələrin və terminlərin təhlili ilə formalaşır. Bu kontekstdə, Prenskinin rəqəmsal yerlilər və immiqrantlar adlandırdığı rəqəmsal mədəniyyətdə fərdlərin yerləşdirilməsi texnologiyanın necə istifadə edildiyi ilə yaxından əlaqəli olduğunu göstərir. Baudriyardın Simulyasiya və Simulakra ilə yeni mədəni əkslər yaşanır və hiperreallıq əldə edərək reallığın sosial transformasiyaya təsiri müşahidə edilir. Sosial həyat standartları və rəqəmsal mədəniyyətdəki təcrübələr də bəzi mütəfəkkirlər tərəfindən müxtəlif mövzularda daxil edilmişdir. Bunun üçün texnologiyanın bir çox fərqli faydalarını görmək mümkündür. Tədqiqatda istehlak cəmiyyəti, müşahidə cəmiyyəti və risk cəmiyyəti anlayışları rəqəmsal mədəniyyətin çərçivəsini müəyyən etmək baxımından mühüm aydınlıq gətirir və rəqəmsal mədəniyyətdə sosial həyat təcrübələrində fərqli rolları təqdim edir.

Rəqəmsallaşmanın ən böyük xüsusiyyətlərindən biri rəqəmsal platformalarda fərdin hərəkətlərinin davamlı qeyd edilməsi olmuşdur. Bu vəziyyətin müsbət və mənfəət əksini görmək mümkündür. Təhlükəsizlik və risklərin qarşısını almaq üçün böyük məlumatlara və süni intellektə böyük diqqət yetirilir. Digər tərəfdən, böyük məlumat və süni intellekt olaraq xarakterizə edilən bu termin həm də qeyri-məhdud nəzarət yarada bilər və bu məlumatların bir çox fərqli məqsədlə izlənməsini təmin edir. Bu kontekstdə böyük verilənlərin istifadəsi süni intellektlə inteqrasiya edilərək təhlil edilib və onu azadlıq, məxfilik və nəzarət vasitəsilə qiymətləndirib.

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# Təhsildə İnformasiya Kommunikasiya Texnologiyalarının rolu

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**Açar sözlər:** İKT, təhsil, texnologiya, informasiyalaşdırma, multimedia

**Ключевые слова:** ИКТ, образование, технологии, информатизация, мультимедиа

**Key words:** ICT, education, technology, informatization, multimedia

## Abstract

Information and Communication Technologies (ICT) have emerged as a transformative force in modern society, significantly impacting economic development and educational advancement. The integration of ICT into educational frameworks not only enhances teaching methodologies but also fosters more interactive and efficient learning environments. By facilitating the generation, dissemination, and application of knowledge, ICT plays a critical role in advancing scientific and technological progress. Furthermore, its application in educational settings supports the development of essential 21st-century skills, empowering students to take an active role in their learning while enabling educators to deliver more dynamic and effective instruction.

Bu gün İKT cəmiyyətin inkişafına güclü təsir göstərən əsas amillərdən birinə çevrilmişdir. İKT-nin tətbiqinin səviyyəsi hər bir ölkənin intellektual və elmi potensialının, sosial vəziyyətinin iqtisadi inkişafının əsas göstəricilərindən biridir. Gələcəkdə iqtisadiyyatın inkişafı isə əslində təhsilin informasiyalaşması ilə bağlıdır.

Hazırda cəmiyyətin informasiyalaşdırılması, bütün müəssə və təşkilatların elmi-texniki tərəqqinin əsas isitiqamətlərindən biridir. Belə ki, müasir dövrdə heç bir istehsalat və qeyri-istehsalat sahələrini kompütersiz təsvür etmək mümkün deyil. Kompüter həyatımızın bütün sahələrinə nüfuz edib. Kompüterlərdən müəssə və təşkilatlarda müxtəlif məqsədlər üçün istifadə olunur: riyazi; elmi-texniki məsələni həll etmək; texnoloji və təşkilati prosesləri idarə etmək; insanların informasiyaya olan tələbatını ödəmək; mürəkkəb situasiyalarda qərar qəbul etmək üçün köməkçi vasitə kimi istifadə etmək; dünya və yerli informasiya şəbəkəsinə müraciət etmək; məişət məsələlərin həllini asanlaşdırmaq; müəyyən fənnlərin keyfiyyətini artırmaq; bu və ya digər dillərin vizual şəkildə öyrənmək və s.

İnformasiyalaşdırma, kompüter, telekommunikasiya texnologiyalarının, eləcə də müasir informasiya sistemlərinin tətbiqi yeni kefiyyətdə biliklərin alınmasını, ümumiləşdirilməsini, yaranmasını, eyni zamanda istifadəsini, demək olar ki, bütün sahələrdə təmin edir. Bu proses elmi sahələrdə də özünü qabarıq şəkildə büruzə verir. Alim və mütəxəssislərin zəruri elmi informasiyalarla vaxtında təmin edilməməsi elmin və sənayenin inkişaf tempinin düşməsinə apara bilər. Bunun qarşısını isə yalnız ən yeni İKT-dən istifadə etməklə, informasiya fondlarını elektronlaşdırmaqla almaq olar. İnformasiya-kommunikasiya texnologiyalarının tədris prosesinə tətbiqi müxtəlif dərəcə formalarının həyata keçirilməsinə və onların istifadə olunması üçün pedaqoji şərtlərin formalaşdırılmasına imkan vermişdir. Belə ki, tətbiq edən müəllimin bu sahə üzrə müəyyən bacarıq və vərdişlərinin olması, internet resurslarına və multimedia vasitələrinə uyğun olan təhsil şəraitinin yaradılması, tədris olunan fənnin (və ya mövzunun) məzmununun müfəssəl şəkildə çatdırılmasına nail olunması zəruri tələblərdir. Yeni texnologiyaların təsirini tanıyaraq iş yeri və

gündəlik həyat, bugünkü müəllim, təhsil qurumları təhsil proqramlarını yenidən qurmağa çalışırlar. Sınıf imkanları, tədris xərclərinin minimuma endirilməsi üçün bu gün və gələcək arasındakı texnologiya boşluğunu öyrənmək qarşıda duran əsas vəzifələrdəndir. Texnologiyadakı sürətli inkişaf siyasəti, həm yaşayış tərzimizə, həm də cəmiyyətin tələblərinə yaradıcı bir şəkildə dəyişiklik etdi.

Rowland (1996) tərəfindən qeyd edildiyi və göstəriləndiyi kimi informasiya və kommunikasiya texnologiyaları (İKT) siyasəti Hafkin (2002) əsərində şaquli, altyapı və üfüqi siyasətlərə ayrılır. Şaquli İKT siyasəti təhsil, səhiyyə və turizm kimi sektor ehtiyaclarını həll edir. İnfrastruktur aspekt milli infrastrukturun inkişafı ilə əlaqədardır və bununla sıx bağlıdır. Üfüqi cəhət cəmiyyətin daha geniş aspektlərinə təsirindən bəhs edir. Məlumat azadlığı, tarif və qiymətlər, gizlilik və təhlükəsizlik və.s kimi. Bu illər ərzində tədris və təlimdə İKT inteqrasiyasını ölçmək üçün bir çox modellər təklif edilmişdir. Bu modellər dörd kateqoriyaya qruplaşdırıla bilər: öyrənmə mikro modellər, İKT yönümlü mikro modellər, sistem modelləri və populyasiya modelləridir. (Newhouse, Trinidad, & Clarkson, 2002) İKT-nin inteqrasiyası, tədris və öyrənməni yaxşılaşdırmaq üçün təhsil sisteminə texnologiyanın tətbiq edilməsinin hərtərəfli bir prosesidir. Müvəffəqiyyəti yalnız mövcudluğundan asılı deyil və texnologiya, həm də pedaqoji dizayn üzərində qurulmuşdur. Bunun üçün bir düstur olmasa da təhsil sistemində İKT inteqrasiyasının optimal səviyyəsinin müəyyənləşdirilməsi, yaradıcı müəllimlər təhsilin bütün səviyyələrində həmişə yenilikçi tədris vəsaitlərinin daxil edilməsinin yollarını tapmışdır və onları uğurla tətbiq etmişdilər.

İnformasiya və kommunikasiya texnologiyaları (İKT) təhsili tamamlaya, zənginləşdirə və daha yaxşıya doğru dəyişə bilər. Hazırda informasiya kommunikasiya texnologiyaları (İKT) insan həyatının bütün sahələrinə təsir edir. İş yerlərində, işdə, təhsildə və əyləncədə gözə çarpan rollar oynayır. Üstəlik, bir çox insan İKT-ni dəyişikliklərin katalizatoru kimi tanıyır; iş şəraitində dəyişiklik, məlumatların işlənməsi və mübadiləsi, tədris metodları, öyrənmə yanaşmaları, elmi araşdırmalar və informasiya kommunikasiya texnologiyalarına giriş. Bu rəqəmsal dövrdə sinifdə İKT istifadəsi öyrənənlərə tələb olunan 21-ci əsr bacarıqlarını öyrənmək və tətbiq etmək imkanları vermək üçün vacibdir. İKT tədris və öyrənməni və pedaqoji mühit yaradıcıları rolunu yerinə yetirmək üçün müəllimlər üçün əhəmiyyətini daha da yaxşılaşdırır. İKT müəllimin tədrisini cəlbedici təqdim etməsinə və təhsil proqramlarının istənilən səviyyəsində öyrənənlər üçün öyrənməyə kömək edir. İnternet və interaktiv multimediyaya ilə nümunə olan İnformasiya və Kommunikasiya Texnologiyaları (İKT), şübhəsiz ki, gələcək təhsil üçün vacib bir fokusdur və rəsmi tədris və təlimə effektiv şəkildə inteqrasiya olunmalıdır - xüsusən də müəllim təhsil müəssisəsində. Müəllimlər şagirdlərin akademik standartlara çatmasına kömək etmək üçün rəqəmsal alətlərdən və mənbələrdən istifadə etmə bilik və bacarıqlarına sahib olmalıdırlar.

İnformasiya Kommunikasiya Texnologiyalarını təhsildə tətbiqini zərurəri edən səbəblər:

Bir sözlə İKT bu gün cəmiyyətdə, təhsildə dinamik dəyişikliklər edir və tədris-öyrənmə prosesini maraqlı və rəngarəng edir. İKT-nin tədris- öyrənmə mühiti ilə düzgün inteqrasiyası, məhsuldarlığın artması ilə yanaşı təhsil alma şansını da artırır. İnformasiya kommunikasiya texnologiyaları təhsil də daxil olmaqla həyatın bütün sahələrinə təsir edir. Bu gün israrla demək olar ki, İKT- İnformasiya və Kommunikasiya Texnologiyaları dünyanı dəyişdirəcək gücə malikdir.

İKT təkə ali təhsil müəssisələrində öyrənilən məzmunə təsir etmir, dəyişdirir və dəstəkləyir, həm də tələbələrin öyrənmə tərzini dəyişdirir. Eynilə, müəllim mərkəzli öyrənmədən, şagird mərkəzli bilik formalarına doğru bir hərəkət var. İKT şagirdlərin öz təlimləri üçün məsuliyyət götürməyə təşviq edildiyi müasir bir öyrənmə yanaşmasını asanlaşdırdı. Tələbələr getdikcə daha çox öyrənəcəkləri veb və onlayn mövzu mütəxəssislərinə tərəf yönəliirlər və beləliklə müstəqil öyrənmə mühiti yaradırlar. İnternet və İKT alətlərinin köməyi ilə ali təhsil alan tələbələr video, sənədli filmlər, podkastlar və mütəxəssislərin çıxışları da daxil olmaqla müxtəlif məlumat mənbələrini əldə edə bilərlər. Müasir təhsildə hamımızın yaxşı tanıdığı ənənəvi tədris vəsaitləri ilə yanaşı müəllimlər getdikcə müasir texnologiyalardan istifadə edirlər. Müasir təhsil tapşırıqları müəllimdən daim özünü inkişaf etdirməyə, özünü təbiiyətə hazır olmağı, şagirdimizə hansı nəticəni gətirməli

olduğumuzu görə bilməyimizi, ətrafımızdakı dünyanı övladımız üçün cəlbədicə etməsini, fikirləri ilə ona ilham verməyi, yaxın və bir az irəlidə olmağı öyrənməyi, uşağı yol boyunca aparmağı tələb edir. Bütün bunlar, müasir bir müəllim üçün digər əsas səriştələrlə yanaşı, bir müəllimin İKT səriştəsinin vacib və açar bir hala gəldiyini düşünməyə vadar edir. Müəllimin informasiya səriştəsi, müəllimin, pedaqoqun fəaliyyətində texniki bilik və bacarıqların şüurlu, məqsədyönlü, səmərəli tətbiqi kimi başa düşülən geniş bir anlayışdır, peşəkar fəaliyyətin tərkib hissələrindən biridir. İnformasiya texnologiyalarından istifadə öyrənmə motivasiyasını inkişaf etdirərək dərslərin effektivliyini artırır ki, bu da tədris prosesini uğurlu edir. Müasir cəmiyyət müəllimlər qarşısına yalnız bilik ötürülməsini deyil, həm də məktəblilərin şəxsən əhəmiyyətli keyfiyyətlərini inkişaf etdirmək vəzifəsini qoyur. Fənn müəlliminin əsas səriştəsi onun yenilənmiş roludur- şagirdlərin sərhədsiz məlumat dənizində gəzib-dolaşmasına kömək edən bir növ bilik dirijoru rolunu. G.K. Selevkoya görə, müasir bir müəllimin vəzifəsi "fərdi bir təhsil marşrutunun optimal seçimini və keçid yollarını öyrətməkdir, yəni , "Təhsildə naviqasiya" –nı təmin etməkdir.

Beləliklə, İKT-nin təhsildə tətbiqi, biliklərin və bəşəriyyətin topladığı texnoloji və sosial təcrübənin tək cə nəsildən nəsələ deyil, həm də bir insandan digərinə ötürülməsini əhəmiyyətli dərəcədə sürətləndirir.

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## Philosophical Sciences

# CHARACTERISTIC FEATURES OF THE 19TH CENTURY AZERBAIJANI ENLIGHTENMENT

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### *Annotation.*

The article examines the features of the Azerbaijani enlightenment. The definition of the system of religious and cultural values of the Azerbaijani enlightenment and its relevance in modern times are shown. The article also defines the essence of the concept of "value" in the Azerbaijani enlightenment, makes generalizations about cultural values on the basis of literary and artistic works of the Azerbaijani enlighteners of the XIX century. Enlightenment is one of the important socio-political, cultural and philosophical events in the history of Azerbaijani thought. Enlightenment is presented as a system of ideas and thinking that forms the nation, as an important stage in the development of Azerbaijani culture. The emergence of a new worldview in the Enlightenment gave impetus to the formation of a certain system of values. Enlightenment values are the reference point of every cultural-historical movement, philosophical school and artistic trend. Enlightenment The new period is an interesting and complex stage in the history of Azerbaijan.

*Key words: enlightenment, philosophical sciences, Azerbaijan, Europe, history of philosophical thought*

In the history of European public opinion, from positivism to postmodernism, each emerging artistic trend or philosophical system defined its program on the basis of the attitude to the value system of the Enlightenment. Enlightenment in Azerbaijan symbolized a new stage of development in relation to previous periods, ideological, literary and cultural systems. In our opinion, the study of the process of formation of a complex of enlightening ideas is relevant in terms of understanding and interpretation of the development of the public opinion landscape of modern Azerbaijan.

Eighteenth-century European marathon gave the world great thinkers. Therefore, the 18th century in Europe is rightly called the "century of philosophers" Locke, Sheftsbury, Berkeley, Hume, Montesquieu, Voltaire, Diderot, Russo, Golbach, Helvetius, Lometri, Condilyuk, Leibniz, Lessing, Mendelssohn, Kant, Herder, Hete, Schiller... - this is a short list of names. The diversity of their philosophical views and concepts still amazes us today. These philosophers were united by a common enlightenment platform: the denial of the monarchy, the abolition of patriarchal-feudal remnants, the struggle against religious fanaticism and total church violence in all spheres of life, and so on. The general sharp critical attitude to reality The eighteenth-century enlighteners believed that man and society could be changed by the laws of reason. Interestingly, at that time not only those who were professionally engaged in philosophy, but also those who thought independently and were able to think intelligently were called philosophers.

The eighteenth century was a time of European thought and criticism, so it is also called "the age of criticism". The main target of criticism was not the religion, but the church. That is why there are serious changes in the religious views of European educators. Enlightenment is one of the important socio-political, cultural and philosophical events in the history of Azerbaijani

thought. Enlightenment is presented as a system of ideas and thinking that forms the nation, as an important stage in the development of Azerbaijani culture. The emergence of a new worldview in the Enlightenment gave impetus to the formation of a certain system of values. Enlightenment values are the reference point of every cultural-historical movement, philosophical school and artistic trend. Enlightenment The new period is an interesting and complex stage in the history of Azerbaijan. Azerbaijani Enlightenment was a socio-political, social event that engulfed the "old world" in the 19th century, emerging as a "operational space" of rational discourse, a cult of cognition and practice, which in turn allowed for different approaches to old religious and cultural stereotypes and principles.

Enlightenment led to the formation of a hierarchy of values, such as a social, cultural, literary movement, or a new worldview system. When we say "enlightenment", we mean "the concept of scientific language used by a modern researcher who wants to build a model of cultural history" [5, p.55]. Comparison of "circulating" ideas and opinions at that time allows to determine the social context of enlightenment. For example, when studying the organization of new forms of social contacts (new type of school, newspaper, Freemasonry), their strategies should be taken into account, not their class, religious or ideological affiliation. In order to show the uniqueness of the Azerbaijani Enlightenment, arguments are brought mainly from the religious and spiritual sphere. However, the analysis of the socio-economic Situation allows us to show specific features. The Azerbaijani Enlightenment is a complex cultural phenomenon that covers all social levels of nineteenth-century society. It was in the 19th century that the reconstruction of the Azerbaijani cultural system took place on the basis of communication and economic, cultural exchanges, as a result of the transformation of the material and intellectual environment. As the name suggests, the main concepts of this system are related to the concept of "education". Azerbaijani enlighteners believed that the welfare and existence of the people passed through enlightenment, science, education and upbringing.

Enlightenment was seen as the concept of the basic idea that characterized the Enlightenment ideology, and the three main driving forces of this ideological system-the school, the press, and the theater-were left out. The study of the processes of formation of ideas and values of enlightenment is relevant in the face of global challenges in terms of understanding the historical and cultural development processes of modern Azerbaijan. In addition, existing knowledge and ideas about the values of the Enlightenment are incomplete. At first glance, the Enlightenment period has been studied in detail by historians, literary critics and culturologists. In these studies, the idea of a "cult of mind" and enlightenment is considered to be almost the main feature of enlightenment. However, in recent years, there has been an opinion among the representatives of various sciences that many ideological deviations and stereotypes have been allowed in the interpretation of the Enlightenment. The role of Russian and partly European enlightenment in the formation of the enlightenment ideology in Azerbaijan is undeniable. Bringing education to the forefront, the interests of the common people are the common values that unite them. "As in Europe, enlightenment in Azerbaijan was born to announce the end of the previous epoch in spiritual and ideological progress - the end of the Middle Ages, and at the same time to make the transition" [2, p.630].

The period of enlightenment in Azerbaijan is characterized as an important stage of cultural development in the history of the peoples of the West and the East. No such high opinion was expressed in honor of the human mind as in the Enlightenment, no criticism was voiced against the institution of religious absolutism, in the hope that mankind could be saved from social and religious oppression. The concept of "enlightenment period" raises certain questions: in general, was there an "enlightenment period" in Azerbaijan, and if so, what specific period of time does it cover? What are the characteristics of the Enlightenment? Who was the first classic of the Enlightenment? In an article, I.S.Braginsky answers this question with a rhetorical question: \*

Voltaire introduced the term Enlightenment to literature. Can it be called a classic of French Enlightenment literature, a French Enlightenment classic?" [6, p.307]. These questions can be applied to the Azerbaijani enlightenment. There are still differing views on the periodization of enlightenment.

There are many interesting ideas in the scientific literature about the role of European (French) and Russian enlightenment in the formation of Azerbaijani enlightenment. According to researchers, enlightenment should be seen as a result of "Western influence" in the "ideological struggle" against religious superstition and ignorance that have been entrenched for centuries in traditional Muslim society. This aspect is more obvious in M.F.Akhundov's views. He "always set an example" to authors from France, Russia and other European nations in the promotion of enlightenment ideas (3, p.318). Ali Sultanli writes: "The intellectual development of the Azerbaijani people ... an important turning point began in the 19th century. It was also an enlightenment movement expressing the spiritual needs of our people, inspired by the advanced ideas of Russian culture" [4, p.73].

But we must not forget that each national literature has its own characteristics and typological regularities. On the other hand, "the broad public background, objective-historical context" that determined the direction of the literary movement (enlightenment - S.B. in Azerbaijan was not only the Russian and European environment, but also the Middle East as a whole" (2, p.643). The "tolerance" and diversity of thought of the Azerbaijani enlightenment of the XIX century lies in the fact that on the one hand it tried to preserve the East-Islamic ethical values, on the other hand, it was preparing to accept European cultural values. The romanticism of the twentieth century also grew in the atmosphere of enlightenment. This was, in fact, due to the artificial application of many provisions of the French Enlightenment to the Azerbaijani version.

The enlighteners wanted to expand by creating a public sphere for the free dissemination of ideas related to education and upbringing. They were interested in the mechanisms of ensuring the free circulation of these ideas in the social structure and their assimilation, that is, so that everyone could benefit from the achievements of this social infrastructure.

It was the activity of educators in this direction that led to the gradual formation of the public sphere in Azerbaijani society. The creation of the first libraries, the first newspapers, the first theatrical performances, the formation of literary and artistic criticism and scientific, artistic translations - all these cultural innovations later laid the foundation for the so-called "thought revolution" in the twentieth century. The period of enlightenment is one of the brightest periods in the development of Azerbaijani culture. Radical changes in the sphere of public thought, as well as social, political and cultural experience of the Azerbaijani people. The cult of mind and knowledge, which is the essence of the Azerbaijani Enlightenment, was not only the epistemological ideal of the time, but also its social imperative. Therefore, the enlighteners were looking for ways to expand the "spread zone" of cognition, to create new cultural spatial spheres for the free spread of ideas. That is, a social infrastructure of free cognition must be created so that everyone can freely benefit from its achievements. One of the main manifestations of the "revolution of thought" was the pedagogical revolution. In enlightenment, the cult of cognition (mind) conditioned the necessity of the cult of education (school).

The selfless activity of educators in this direction laid the foundation for the gradual formation of the social sphere in Azerbaijani society. The creation of a social sphere is one of the important factors in the development of democracy. Contemporary German philosopher J. Habermas in his book "Structural Transformation of the Public Sphere" notes that the emergence of a public sphere, the main features of which are egalitarianism, common interest and rational argumentation, created conditions for open and public discussion of public issues. This process was of great importance for the formation of a specific culture of rational-critical judgment" [1].

The publication of newspapers, the creation of theaters, public libraries - all these cultural innovations should have led to a process called the "revolution in thought. The establishment of the national theater and press, the establishment of the first democratic republic in the Muslim East was the result of the realization of the ideas of the Enlightenment. The intellectual revolution in Azerbaijani culture and literature emerged as a result of intense spiritual and practical activity of thinkers (M.F.Akhundzade, H.Zardabi, A.Bakikhanov, etc.) directly related to the Enlightenment movement.

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# Historical Sciences

## Golden Horde

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The Golden Horde was a medieval state established in the mid-13th century by Batu Khan, a grandson of Genghis Khan. Its territory covered parts of modern-day Russia, Kazakhstan, Ukraine, and Crimea. As a significant Ulus, or province, it represented the western part of Genghis Khan's vast empire.

The Golden Horde was formed in the 1240s following Batu Khan's campaigns in the West. During these campaigns, his army conquered Kievan Rus and parts of Eastern Europe. Initially, the Golden Horde was part of the Mongol Empire, but it eventually became an independent state.

In the Golden Horde, political power was concentrated in the hands of the Khans. They were supported by noyans, biys, and other aristocrats. After Islam was adopted as the state religion, the political system began to align more closely with Islamic governance models.

Initially, the rulers of the Golden Horde practiced shamanism. However, by the mid-14th century, during the reigns of Berke Khan and Uzbek Khan, Islam became widespread and was established as the official state religion.

Located at the crossroads of Eurasian trade routes, the Golden Horde relied heavily on trade. Using the Great Silk Road, it developed strong trade relations with China, Central Asia, Iran, Byzantium, and various European countries.

The Golden Horde gained control over the eastern part of Kievan Rus and its principalities. After conquering Kiev in 1240, the Russian principalities became vassals of the Golden Horde. Russian princes were subordinate to the Khans and could not rule without their approval, which required obtaining a special "decree" from the Golden Horde.

The Russian principalities were required to pay regular taxes to the Golden Horde, known as the "pulley." To ensure tax collection, the Mongol rulers appointed officials specifically for this task. This system made the Russian principalities economically dependent on the Golden Horde.

The Golden Horde utilized the Russian principalities for its military and political objectives. Russian princes were occasionally required to join campaigns against the Horde's enemies. Additionally, during power struggles within the Golden Horde, Russian princes often supported specific Khans, leading to instances where the Russian principalities became involved in the internal politics of the Golden Horde.

The relationship between the Golden Horde and the Russian principalities played a key role in the rise of the Moscow Principality. The princes of Moscow established favorable relations with the Golden Horde, obtained *yarlyks* (official decrees) from the Khans, and took over tax collection on their behalf. This role boosted Moscow's economic and political influence, eventually making it the primary center of Rus. With the support of the Golden Horde, the Moscow princes grew stronger than other regional rulers, consolidating their power and expanding their authority.

The Russian principalities also resisted the dominance of the Golden Horde. In 1380, at the Battle of Kulikovo, Moscow Prince Dmitry Donskoy defeated the army of the Golden Horde commander Mamai. This victory inspired a stronger desire for independence among the Russian principalities. However, the Golden Horde's decline happened gradually and culminated in the 15th century. In 1480, Prince Ivan III of Moscow successfully achieved full independence from the Golden Horde, marking the end of its influence over the Russian lands.

Cultural ties between the Golden Horde and the Russian principalities were significant. Through the Golden Horde, Eastern culture, elements of Islam, and Eastern art and architecture were introduced to Rus. Additionally, the Golden Horde's control over Eurasian trade routes facilitated trade and enabled Russian merchants to establish connections with Eastern countries, further strengthening cultural and economic exchanges.

The Golden Horde and the Ottoman Empire, both major political and economic powers in Eurasia, maintained close ties. These relations were primarily diplomatic, trade-based, and military in nature, with both empires benefiting from mutual cooperation in various areas.

The founder of the Ottoman Empire, Osman I, and his successors sought to establish peaceful relations with the Golden Horde due to its immense military power and control over key Eurasian trade routes. Recognizing the importance of the Golden Horde, the Ottoman rulers sought the support of the Horde's Khans. As a result, their ties developed in trade and cultural exchange, benefiting both empires.

The Golden Horde and the Ottoman Empire, both controlling major trade routes in Eurasia, had significant trade relations. The Great Silk Road and other routes passing through the Golden Horde supplied valuable goods to the Ottoman Empire, including silk, spices, leather, and metals. Trade caravans crossing the Black Sea and the Caspian Sea further strengthened the economic ties between the two states.

The relationship between the Golden Horde and the Ottoman Empire was complex, with both alliance and rivalry at different times. At times, the Golden Horde allied with the Ottoman Empire, supporting the Ottomans in their battles against Byzantium and other European states. However, during internal power struggles within the Golden Horde, the Ottoman Empire sometimes sought to pursue its own independent policies, distancing itself from the Horde's influence.

Both the Golden Horde and the Ottoman Empire adopted Islam as their state religion, which helped strengthen their cultural and religious ties. The Golden Horde converted to Islam under Berke Khan, while the Ottoman Empire was established as a Muslim state. This shared religious foundation fostered a mutual understanding, as Islamic law and culture influenced both empires, making cooperation between them more natural and effective.

At the beginning of the 15th century, the Golden Horde, weakened by internal strife and political instability, began to disintegrate into several independent khanates. During this time, the Ottoman Empire grew stronger and emerged as one of the most influential states in the region. After the Ottoman conquest of Constantinople in 1453, they took control of the critical trade routes in the area. The new khanates that emerged from the remnants of the Golden Horde—such as the Kazan, Crimean, and Astrakhan khanates—maintained close relations with the Ottoman Empire.

After the collapse of the Golden Horde, the Crimean Khanate, once part of it, became a vassal of the Ottoman Empire. The Crimean Khans pledged loyalty to the Ottoman sultans, who provided military and political support in return. Through the Crimean Khanate, the Ottoman Empire was able to maintain its influence over the former lands of the Golden Horde.

After the collapse of the Golden Horde, several successor states emerged, with the most influential being the Crimean Khanate, Kazan Khanate, Astrakhan Khanate, Nogai Horde, and the Siberian Khanate. These khanates inherited the political, cultural, and ethnic legacies of the Golden Horde and adapted them to their new circumstances, continuing many of the traditions and systems of governance established by the Horde.

The Crimean Khanate was established in the southwestern part of the Golden Horde in 1441 by Hacı Gery. For a long time, it was a powerful state and eventually became a vassal of the Ottoman Empire. The Crimean Khans maintained the political structure and governance system of the Golden Horde. The Khanate played a significant role in trade and politics in the Black Sea

region. In 1783, it was captured by the Russian Empire, leading to the abolition of the Crimean Khanate.

The Kazan Khanate was founded along the Volga River, on the territory of the city of Bolgar, one of the former capitals of the Golden Horde. It emerged in 1438 as part of the Golden Horde under the leadership of Muhammad Khan. The Kazan Khanate upheld the culture, Islamic religion, and political traditions of the Golden Horde. In 1552, the Kazan Khanate was conquered by the Russian Kingdom, marking its fall.

The Astrakhan Khanate was established in the southeastern part of the Golden Horde, near the Caspian Sea, after separating from the Golden Horde in 1466. Islam became the state religion of the Khanate. In 1556, the Astrakhan Khanate was incorporated into the Russian Empire, marking the end of its independence.

The Nogai Horde (15th–17th centuries) was formed in the western part of the Golden Horde, covering parts of modern Kazakhstan and Russia. It retained the nomadic power and traditions of the Golden Horde. As heirs of the Golden Horde, the Nogais had significant political and ethnic influence in the region. The Nogai Horde existed for several centuries before falling under the influence of the Russian Kingdom and eventually disintegrating.

The Siberian Khanate (1420–1598) was founded in the northeastern part of the Golden Horde, along the Irtysh River. It played a key role in linking Central Asia and Russia. In 1598, after being conquered by the Russian Empire, the Siberian Khanate was abolished, and its territory was incorporated into Russia.

The Great Horde (also known as the Big Horde) was the main successor state to the Golden Horde, formed on its central territories. However, its power gradually weakened over time. The disintegration of the Great Horde was largely due to the rising influence of the Moscow Principality and the Crimean Khanate. In 1502, the Crimean Khan Mengli Gerei defeated Akhmet, the last Khan of the Great Horde, effectively ending the Horde's existence once and for all.

The hereditary khanates that emerged after the fall of the Golden Horde preserved its Islamic religion and Turkic-Mongolian traditions. Islamic culture, along with the governance systems, continued to shape the new khanates. The laws and governance model of the Golden Horde, particularly the "Yasa," were maintained in these regions. These khanates had significant cultural and political influence on the Russian state and neighboring areas. The Moscow Principality, drawing from the experience of the Golden Horde, used this legacy to establish a centralized system of government, which played a key role in the development of Russia.

The culture of the Golden Horde was a unique blend, shaped by the integration of Turkic and Mongolian traditions, Islam, and the diverse peoples of the Central Eurasian region. This multicultural fusion was reflected in various aspects of life, including artistic expression, architecture, writing, music, and customs. The Golden Horde's culture became a distinct phenomenon, showcasing the synthesis of different ethnic and cultural influences, with significant contributions to the arts and intellectual traditions of the time.

The Golden Horde was a multi-ethnic state that united various peoples, which became the foundation of its rich cultural heritage. It included Turkic, Mongolian, Kipchak, Bulgar, Slavic, Armenian, Georgian, and other groups. Each of these peoples contributed their unique traditions, languages, and cultures, enriching the cultural synthesis of the state. This diverse mix of influences helped shape the distinctive cultural identity of the Golden Horde, blending elements from Central Asia, the Caucasus, the Volga region, and beyond.

Although the ruling elite of the Golden Horde was of Mongolian origin, the culture of the local Turkic peoples gradually became dominant. Over time, Turkic language, traditions, and customs spread throughout the state, influencing its political, social, and cultural life. By the end of the 14th century, Turkic culture had become the primary ethno-cultural characteristic of the Golden Horde, shaping its identity and leaving a lasting impact on its governance and culture.

The religious structure of the Golden Horde was diverse. While Islam became the dominant religion, there was a tolerant attitude toward other religions, including Christianity, Buddhism, and shamanism.

When Berke Khan converted to Islam, the Golden Horde became a Muslim state. Mosques and madrasas were built, and Islamic law was introduced. The Golden Horde established close ties with the Islamic world and contributed to the development of Islamic culture.

The Golden Horde used different languages and scripts. In public administration, the Turkic language was predominantly used, while Arabic became widely adopted in religious and scientific circles.

In the Golden Horde, Turkic became the main language, with many official documents and records written in it. Written literature in Turkic grew, particularly in religious and historical works, as well as poems, which held a special place.

With the spread of Islam, Arabic script became widely used in the Golden Horde, especially for religious texts and official documents. The literary heritage of the Golden Horde mainly consisted of religious works, though there were also historical and artistic pieces. One notable example is the "Codex Cumanicus," written in the 14th century, which describes the language, traditions, and way of life of the Kipchaks.

The Golden Horde, with its vast territory, had several capitals and large cities that served as administrative, trade, and cultural centers at different times. The two most important capitals were Saray-Batu and Saray-Berke.

Saray-Batu was the first capital of the Golden Horde, founded by Baty Khan in 1243. It was located in the lower reaches of the Volga River, in what is now the Astrakhan region.

Saray-Batu was the main political and commercial center of the Golden Horde. Located along the routes of the Great Silk Road, it played a key role in international trade. The city's markets sold goods imported from Central Asia, China, Persia, and Europe.

Saray-Batu was notable for its architecture and urban infrastructure, featuring caravanserais, mosques, baths, and other public buildings. However, its importance began to decline toward the end of the 14th century, particularly after the construction of the new capital, Saray-Berke.

Saray-Berke became the second capital of the Golden Horde, following Saray-Batu. It was founded at the end of the 13th century and named after Berke Khan, the ruler of the Golden Horde.

Saray-Berke, located near Saray-Batu on the Volga River, served as the political and commercial center during the Golden Horde's most prosperous period. The city was large and well-developed, with mosques, caravanserais, and other significant buildings. Islam was reinforced at the state level, and Islamic culture and art flourished. However, in 1395, during Emir Temur's campaign against the Golden Horde, Saray-Berke was destroyed, leading to the loss of its significance.

Sarai Al-Mahrusa is mentioned in some historical sources as a third capital of the Golden Horde. It was an important center in the XIV–XV centuries, located on the Volga River. The city played a significant role in the development of Islamic culture, further contributing to the cultural and political strength of the Golden Horde during its peak.

Haji-Tarkhan, now known as Astrakhan, was one of the most important trading cities of the Golden Horde. In the XIII–XIV centuries, it became a major port city and controlled vital trade routes across the Caspian Sea. Later, Haji-Tarkhan became the capital of the Astrakhan Khanate, which emerged as one of the successor khanates of the Golden Horde.

Syganak, located in modern Kazakhstan, was an important city in the eastern part of the Jochi Ulus and a significant center during the time of the Golden Horde. It later became the capital

of the Ak Horde Khanate, one of the successor khanates after the disintegration of the Golden Horde.

The historiography of the Golden Horde is a complex and multi-layered field of study, shaped by a wide range of sources, national and ideological perspectives, and interdisciplinary approaches. Over time, historical interpretations of the Golden Horde have evolved, reflecting shifts in academic thought and the availability of new sources. This dynamic nature of the historiography underscores the continuing relevance of the Golden Horde as a subject of scholarly inquiry, with historians continually revisiting and revising past interpretations to gain deeper insights into its political, cultural, and economic impact on Eurasian history.

Early studies of the history of the Golden Horde (XV–XVII centuries) were primarily based on the accounts of Arab, Persian, and European travelers. Key figures such as Ibn Battuta, Rashid ad-Din, and other scholars and travelers documented their observations of the Golden Horde region. These writings offer valuable insights into the daily life, trade relations, political structure, and cultural aspects of the Golden Horde. Their records were among the earliest sources used by historians to understand the state's history, providing a foundational understanding of the empire's influence in Eurasia during its height.

In the XVIII–XIX centuries, as the Russian Empire expanded and took control of the former territories of the Golden Horde, Russian historians began to focus more on studying its history. Scholars like Vasily Tatishchev, Gerard Miller, and Nikolai Karamzin made significant contributions during this period. They provided important insights into the political and economic aspects of the Golden Horde, as well as the intercultural relations between the diverse peoples of Eurasia. Their works helped lay the foundation for modern historical research on the Golden Horde, exploring its impact on the region's development and connections across Europe, Asia, and the Middle East.

During Soviet times, research on the history of the Golden Horde became more systematic and academic. Historians like E. B. Vyatkin, S. G. Klyashtorny, and A. P. Grigoriev made important contributions to the study of the Golden Horde's social and economic structure, as well as its political development. Their works focused on the role of the Horde in Turkic-Mongolian culture and its interactions with other states in Central Asia and the Caucasus. Since Soviet historiography was largely influenced by Marxist theory, much emphasis was placed on analyzing the socio-economic structure of the Golden Horde, including its class relations and the economic foundations of its political power. This approach helped to shape the understanding of the Golden Horde as a key state in Eurasian history.

Today, new technologies and methods are being applied to study the history of the Golden Horde. Archaeological data, ethnographic studies, source research, and philological analysis are providing fresh insights into the culture and daily life of the Golden Horde. Additionally, the growth of international cooperation between scientists from Kazakhstan, Russia, and European countries is helping to advance research, offering new perspectives and expanding access to diverse sources. This collaborative approach is breathing new life into the study of the Golden Horde, enabling scholars to gain a deeper understanding of its historical, cultural, and political significance.

Today, research on the Golden Horde goes beyond political history to include in-depth studies of its economy, culture, religious structure, and ethnic composition. These comprehensive studies help to shed light on the Golden Horde's significant role and place in the Turkic and Mongolian world, providing a more holistic understanding of its impact on the region's development. By exploring various aspects of the state, scholars are gaining new insights into how the Golden Horde shaped the cultures and societies of Central Asia and beyond.

# THE KANGLY PERIOD IN DOMESTIC AND FOREIGN RESEARCH

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**Abstract.** This article examines the settlement of the kangly people, primarily in the territory of Kazakhstan and nearby regions, highlighting their rich history and unique culture. Information is provided on the history, geographical location, ethnic composition, and culture of the Kangly state from the 5<sup>th</sup>-4<sup>th</sup> BCE centuries. Situated along the upper and middle reaches of the Amudarya and Syrdarya rivers, the Kangly state emerged alongside the usuns and was named after its rulers. The article explores the historical connections of the kangly tribes, their social structure, and their military-political organization.

Insights into the Kangly people's pursuit of independence, economic development, trade networks, and craftsmanship are discussed. The article includes references to M. Kashgari's perspectives, specialized historical works, and archaeological findings. Additionally, it highlights the influence of the Kangly tribes on other Turkic peoples – particularly the Kazakh, Uzbek, Kyrgyz, and Karakalpak ethnic groups – as well as the prominent roles their descendants played among the ruling elites. The Kangly state's contributions to Turkic culture and civilization, the traditions of its rulers, and its historical significance are presented with corroborating evidence.

**Keywords:** Kangly, M. Kashgari, Turkic peoples, ruling elite, A.T. Khaidar, theories, researchers' studies.

## Introduction

*Relevance of the Topic:* The Kangly state holds an important place in the history of Central Asia. Studying its culture, economy, social conditions, and ethnic composition has a deep impact on the culture, history, and national identity of the Kazakh people today. The historical legacy of the Kangly, their influence on other Turkic peoples, and their intercultural ties play a significant role in strengthening national unity and revitalizing historical consciousness in modern society.

*The level of knowledge:* Research on the Kangly state is multifaceted. Historians, archaeologists, ethnographers, and linguists have approached this topic from various angles. Researchers like M. Kashgari, A.T. Khaidar, K.M. Baipakov, and N. Myngzhan have extensively studied the cultural, economic, and political aspects of the Kangly, providing concrete data and conclusions. However, some issues remain insufficiently explored, necessitating further scientific research to gain a deeper understanding of the Kangly state's culture and history.

*Purpose and objectives:* The purpose of this article is to study the history, culture, economic, and social structure of the Kangly state, as well as its influence on Turkic peoples. Through this research, it aims to reveal the connections and cultural heritage of the Kangly tribes with contemporary Kazakh, Uzbek, Karakalpak, and Kyrgyz ethnicities. The tasks include: a) studying the history of the Kangly state; b) using historical sources and archaeological findings from the 5<sup>th</sup> - 4<sup>th</sup> BCE centuries; c) identifying its ethnic composition; d) analyzing its culture and economy; and e) examining its art, craftsmanship, trade connections, and other aspects.

### The main part

The Kangly state, established in the 5<sup>th</sup>-4<sup>th</sup> BCE centuries, was located along the upper and middle reaches of the Amudarya and Syrdarya rivers. The ethnic composition of the Kangly consisted of Saka-descended Turkic-speaking tribes, whose culture and economy developed over time, earning them a significant place in the history of Turkic peoples.

**Scholarly Research.** According to researchers, the historical events of the «Great Migration of Peoples» in the latter half of the 2<sup>nd</sup> century BCE led to the emergence of new state formations in Central Asia, including the states of Usun, Yancai, and Kangly. The latter played an important role in the history of Kazakhstan.

Y.N. Bichurin, in studying the legal system of the Kangly state, highlights their tradition of writing and the role in preserving laws. He notes that the royal court maintained a collection of laws, which contributed to the organization of Kangly society. Japanese scholar Siratori, meanwhile, asserts that the kangly tribes were related to modern Kazakhs, pointing out similarities in their lifestyle, customs, and linguistic features. The «Encyclopedia of Kazakhstan History» provides comprehensive information about the social structure, political system, and economic relations of the Kangly state, including details about their military forces and administrative system. Archaeologists and ethnographers have focused on examining the material culture, religious beliefs, and social structure of the Kangly state, revealing the richness of their cultural and spiritual life through artifacts found in Kangly burial sites (Bichurin, 1950: 133).

In his research, K.M. Baipakov emphasizes the significant role of the Kangly state on the historical map of Central Asia, exploring its cultural and economic development, as well as its influence on agriculture and trade. K.M. Baipakov also examines Kangly rituals, including nature worship and ancestor veneration (Baipakov, 2006: 135-137). N. Myngzhan notes the achievements of the Kangly in crafts and trade, discussing their cultural development and production activities. The Kangly excelled in metalworking, ceramics, and decorative crafts, which were essential aspects of their societal life. A.T. Khaidar's research on the Kangly state holds an important place in Kazakh history, providing insights into its political structure, culture, and economy. Kaidar also highlights the kinship between the Kangly and other Turkic-speaking peoples, emphasizing their role in cultural development (Khaidar, 2004: 89). Kaidar's work also explores the Kangly state's geographic location, historical records, and archaeological findings, underscoring its relevance even today. His studies pay close attention to the state's governance system and social structure, which remain pertinent in modern research.

Researchers have diverse views on the ethnonym «Kangly». This becomes clear when examining the perspective of onomastics specialist T.S. Zhanuzakov, who discusses the term in his Russian-language work. He writes, «The oldest ethnonym among the Kazakhs is also «Kangly». In historical sources, records from East Asian researchers present variations of the name as Kan, Kangju, Hanakari, Kangar, Kangui, and Gao-che-Gaogui».

In the work «Kangly: The History of Kazakh Clans and Tribes», it is mentioned that «one of the peoples who came to the aid of the Ferganans in difficult times were the Kangly inhabitants, who retained the original phonetic sound, «haikiakh». As we can see, the variations above are likely connected to this root. This is supported by many records from the 2<sup>nd</sup> century BCE, referring to the Kan and Kanka tribes in the territories of Turkestan and India. Derivative forms such as Kanka, Kangar, Kangüt, and Kangly appear as later variations (with Kangüt as an Eastern transcription). Their morphological markers – such as «-k,» «-r» (-ar), «-t» (-üt, -ut), and «-ly» –are ancient plural forms. The form «Kangka» (Ganga) predates «Kangar,» while «Kangüt» appeared later, leading to the form «Kangly» in the Kazakh context (Kangly, 2008: 137-138).

**History and Geographical Location.** The Kangly state was established in the 5<sup>th</sup>-4<sup>th</sup> centuries BCE along the upper and middle reaches of the Amudarya and Syrdarya rivers. Its territory included the regions of Bukhara, Shakhrisabz, Tashkent, and Khwarezm. This area, intersected by historic

trade routes, provided opportunities to develop cultural and economic connections. The Kangly people were composed of Saka-descended, Turkic-speaking tribes. According to the writings of M. Kashgari, the name Kangly was associated with the king's title, and the local population was named after their ruler. This tradition persisted among Turkic peoples for a long time, leaving a deep impact on their culture (Kashgari, 1997: 126). The Kangly state became an important center of ancient culture and civilization, as evidenced by archaeological discoveries of city structures, craft items, and decorative objects that reflect their cultural heritage. The development of irrigated agriculture, as well as the flourishing of trade and the arts, laid the foundation of Kangly society. Economic Connections. The Kangly established economic ties with Iran, India, China, Syria, and the Caucasus. Along the Syrdarya, they built permanent settlements and craft centers, and specially minted coins were put into circulation (Zakhidov, 2009: 187).

**Social Structure.** The political system of the Kangly state was stable and organized. The head of state, known as the «Wang» (king), held authority over military, economic, and political matters. Influential rulers and leaders emerged within the Kangly confederation, enjoying high status among the Turkic peoples. The Kangly tribe significantly influenced the formation, culture, and political history of Turkic nations and left a legacy that remains among modern Kazakh, Uzbek, Karakalpak, Kyrgyz, and Bashkir ethnicities. The traditions of rulers and khans originating from the kangly persisted for a long time within the Turkic world.

### Conclusion

The Kangly state is known as one of the significant political entities in Central Asia. Located along the Amudarya and Syrdarya rivers, this state flourished at the crossroads of trade routes, achieving economic and cultural prosperity. The Kangly population was composed of Saka-descended, Turkic-speaking tribes, whose culture and economy reached a high level. The works of researchers, particularly M. Kashgari, A.T. Khaidar, and K.M. Baipakov, have greatly contributed to analyzing the Kangly people's cultural heritage, social structure, and influence on Turkic peoples. Archaeological and ethnographic studies reveal new insights into the Kangly lifestyle, crafts, and trade connections. Various theories highlight the Kangly tribes' impact on the culture of the Kazakh, Uzbek, Karakalpak, and Kyrgyz peoples. Thus, the Kangly legacy holds a prominent place in the cultural and historical consciousness of the modern Kazakh people. The Kangly state played a special role in the cultural, economic, and political development of its era, marking it as an important entity in Central Asian history. The historical legacy and culture of the Kangly people have left a lasting impact on the Turkic world to this day. Historians and researchers suggest that the Kangly state's multifaceted nature – its historical, cultural, social, and economic aspects deserves in-depth study. The legacy of the Kangly people holds a vital place in the history of the modern Kazakh people, shaping tribal and clan compositions as well as ethnic identity.

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# THE ROLE OF ACADEMICIAN BOLAT KOMEKOV IN STUDYING THE ETHNOGENESIS AND ETHNIC HISTORY OF THE KIPCHAKS AND KIMAKS

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**Abstract.** The report examines in detail the place of the outstanding Russian academician, Doctor of Historical Sciences, Professor Bolat Yeshmukhambet Komekov in the study of ethnogenesis and ethnic history, statehood of the Kipchaks and Kimaks who inhabited Kazakhstan in the Middle Ages. These two peoples were among the first nomads who began to penetrate the territory of Central Asia and Kazakhstan from the III century AD. They left a significant mark on the history and culture of the medieval states located here, and also made a huge contribution to the formation of the ethnic composition and influenced the further development of the nomadic way of life. The report provides a scientific and analytical review of the history of the study of the Kipchak problem, analyzes the prospects for the development of the Kipchak problem.

**Keywords:** Desht-Kipchak, Bolat Komekov, Kipchaks, Kimaks, ethnogenesis, Turkic peoples, Muslim data.

## Introduction

*The relevance of the topic.* We all know that the Kipchaks and Kimaks were among the most influential peoples of the Eurasian steppe in the history of our country. Their history is closely connected with ethnogenesis, the ethnic history of many peoples, including Kazakhs, Uzbeks, Turkmens, Kirghizs, Karakalpaks, Bashkirs, Karachays, Kumyks, Balkars, Crimean Tatars and other Turkic peoples. The Kipchaks are one of the main ethnic components that became part of the Kazakh people and occupied a special place in the Eurasian space with their large state before the Mongol invasion. Therefore, it is known that the study of the history of him and his brothers and sisters occupies a special place in the study of the evolution of Kazakh culture, language and national identity.

The study of ethnogenesis and ethnic history, the statehood of the Kipchaks and Kimaks and the understanding of the complex processes of migration, communication, and cultural exchange that influenced the ethnic appearance of the Burtutas Turkic peoples inhabiting Central Asia.

*The level of knowledge.* In the topic we are considering, special attention is paid to the valuable works and contributions of our Kazakhstani scientists. Among them are B. E. Komekov, A. K. Kuryshzhanov, Yu. A. Zuev, F. H. Arslanova, S. M. Akhinzhanov, A. N. Garkavets, A. Sh. Kadyrbayev, T. O. Omarbekov, G. B. Khabizhanova and other domestic specialists. Their research revealed the ethnogenesis and tribal composition of the Kipchaks, the early period of the history of the Kimaks,

the formation and development of the Kimak Khaganate, the relationship between the Eastern Kipchak Khanate and the Khorezm state, the location of Desht-Kipchak on a vast land, the transition of the Kipchaks under the influence of the Mongol Empire during the Yuan period and other complex issues. He also contributed to the study of Turkic-Arabic and Latin, Armenian Kipchak written monuments, the Codex Cumanicus as a historical source, and the development of the historiography of Kipchak studies.

*Purpose and objectives.* Creating a complete and objective view of the formation and development of the Kipchaks and Kimaks and their role in the history of Central Asia and Kazakhstan and the formation of the Kazakh people based on the works of Bolat Yeshmukhambetovich Komekov. To understand how the evolution of ethnic identity took place, how it was formed and how it influenced the modern national identity of the Kazakh people. The main objective of the report is to examine the origin and ethnic composition of the Kipchaks and Kimaks, including linguistic, anthropological and genetic data. Identification of the main stages of their ethnic evolution, including migration, assimilation and cultural relations with other peoples. As well as the study of the main stages of the formation of the ethnic community of these two peoples.

### The main part

- Academician Bolat Yeshmukhambetovich Komekov. Our caper is a well-known Russian Orientalist and Arab scholar, Doctor of Historical Sciences, academician of the National Academy of Sciences of Kazakhstan, professor of the Kazakh National University, Al-Farabi and L. N. Gumilev Eurasian National University. Many PhD and doctoral dissertations have been defended under his leadership. For more than 20 years, he headed the Medieval department of Kazakhstan at the Institute of History, Archeology and Ethnography named after Sh. Sh. Ualikhanov. The scientific novelty of the Kimak state, not considered by foreign scientists B. E. It belongs to Komekov, and the author created a scientific school and developed a new direction in science – Kipchakan. Academician B. E. Komekov opened the world's only International Institute of Kypchakology. The purpose of the Institute is to coordinate the research of specialists engaged in the study of the history and culture of the Turkic world, the Arab East and the peoples of Eastern Europe. The Institute cooperates and cooperates with scientific centers and scientists from the USA, Hungary, Egypt, Turkey, Iran, England, France, China, Japan, Russia, Bulgaria, Romania, Ukraine, Armenia.

The priority right in the development of conceptual problems of Kipchak studies at the present stage belongs to Kazakh historical science. B. E. Komekov for the first time in historiography discovered that the reliable basis of written monuments of the Muslim environment is the Kimak state, as well as the ethnic community, which was part of the Kimak country together with the association of Cumans as an independent Kipchak state. After that, the Cumans were under the political influence of the Kipchak khans, and separate groups of Cumans became part of the Kipchak tribe.

The first international scientific conferences led by B. E. Komekov were highly appreciated in scientific circles around the world. He is the author of more than 420 scientific papers, the editor of the first and second volumes of the multi-volume "History of Kazakhstan", as well as the lead author. He took an active part in writing the international encyclopedia "Turkestan". He participated in the development of the 26-volume encyclopedia "History of the Turkic peoples", published in Turkish and English in Istanbul, Turkey, in 1983 he became a laureate of the State Prize of Kazakhstan. In 2002, he was awarded a state scholarship for his services to science. Currently, he is in charge of conducting fundamental research work on the topic "Kipchaks of Eurasia of the 14<sup>th</sup> century." He is one of the leading authors of the 7-volume edition "History of Kazakhstan"

(Komekov Bolat Eshmukhambetovich, 2018: 11-20), published by the Institute of History and Ethnology named after Sh. Sh. Ualikhanov in 2025.

- Research by academician B. E. Komekov related to Kipchaks and sections. He is engaged in the study of medieval history, historical geography of Kazakhstan on the basis of Arabic, Persian, ancient Turkic written monuments. For the first time in historical sciences, the ancient Turkic Kimaki tribe had an urban culture, and agriculture was developed on the basis of Arabic, Persian and ancient Turkic data. He developed the established scientific orientation in the field of Kipchak studies, studied the relationship of Kipchak tribes in Central Asia, Eastern Europe and the Middle East, demonstrating it as a unique example of international communication in the Middle Ages.

The author of the book "the Kimak state of the 9-11<sup>th</sup> centuries according to Arabic data" is devoted to the history of early medieval Kazakhstan. It tells about the Kimaks, which can be traced back to the ancestors of the Kazakh people in the 9-16<sup>th</sup> centuries. Historical and geographical data in medieval Arabic and Persian records have undergone a comprehensive source analysis. Special attention is paid to the resolution of Al-Idrisi's text and cartographic materials, the messages of which turned out to be very important. The issues of the ethnic history of the Kimaks occupy a large place in the work. 9-11<sup>th</sup> centuries. The main stages of the formation and development of the Kimak tribal Union have been revised up to the middle. For the first time, the issues of the existence of the culture of the state and the city were formulated and developed. The socio-economic structure of the Kimak society has given a new look, proving that it employs several economic and cultural types – from nomadic cattle breeding to agriculture (Kumekov, 1970: 120, Kumekov, Kuzembaev, 2014: 99).

According to academician Bolat Komekov, the Kipchaks, who began to unite into one tribal formation from the 8th century, formed a strong union of Kipchak tribes in the 11th century. As an obvious evidence of the high culture of the Kipchaks of the 11-12<sup>th</sup> centuries. Since then, we can say that their language has become a common international language for many, because the caravan routes in the Great Steppes were in their hands. The merchants had to learn the Kipchak language, for which the Codex Cumanicus (Kipchak dictionary) was written. The Kipchaks are one of the ancient Turkic tribes. 7-10<sup>th</sup> centuries. The Kipchaks were dependent on the Kimaks and were part of the Kimak state. The beginning of the 1<sup>st</sup> century is considered a period of political and social rise of the Kipchaks. They owned the region from the Irtysh to the Syr Darya. Before the Mongol invasion, the Kipchaks were called Desht-Kipchak. 13-14<sup>th</sup> centuries. It is known that during the formation of the Kazakh people, it became the main driving force (Kumekov, 1994: 214).

The work that contributed to the development of the historiography of Kypchak studies "Codex Cumanicus" is a famous written monument of the Cuman (Polovtsian) language, written at the beginning of the 14<sup>th</sup> century (1303). Its only copy is kept in the library of St. Mark's Cathedral in Venice. The Codex was written by missionaries based on the speech of the western branch of the Kipchaks. The Codex Cumanicus is a historical document describing the laws and customs of the Kipchaks, the medieval Turkic peoples who inhabited Central Asia and the Caucasus in the Middle Ages. This code contains information about the social structure, religious beliefs, customs and laws of the Kipchaks (Garkavets, 2015: 1348; Kumekov, 2007: 136-141).

In addition, the Codex Cumanicus describes the hierarchy of power in Kipchak society, the role and responsibility of leaders, warriors, women and children. There are also rules of conduct, customs and traditions that the Kipchaks followed. This was of great importance for the Kipchaks, as it regulated the life of society and helped preserve the cultural heritage of this people. Unfortunately, the original codex has not survived to the present day, but its contents are known through historical research and archaeological finds (Codex Kumanicus, 2020:336).

In this codex we find the names of the tombstones of the Kipchaks: A mound (made of soil or stones)- this is how the "Mound" sounds. The shape, the image, including the stone woman-"sin". Mausoleum "kezen". There is also a term for the construction of a tombstone made of

household-type stones- "u". Thus, we see that the Kipchaks still had the terms Karachai and Balkars, which still sound and have the same meaning-Kurgan, kezen-complexe (mausoleum with a two-story roof). Sin-son is a tombstone stele (tombstone).

The Kipchak language is very close to Karachay-Balkar. About 70-80% of the words and names of the Kumanik codex correspond to the modern Karachay-Balkar language. According to K. S. Anarbayev, another monument of the Kipchak language is in the work "judicial acts of 1559" 80% of the words coincide with modern Karachay-Balkaria (Anarbayev, 2020: 336).

The author's work "the country of Kimak on the map of Al-Idrisi" presents translations of the 12th century geographer from Arabic into Russian. An integral part of Al-Idrisi's work is a set of geographical maps called "Surat Al-Arda". This unusual atlas was first published in Latin transcription by I. Lelevel in 1849. I. Y. Krachkovsky called it "the most important monument of Arabic geography". K. Miller and Bahjat Al-Asari republished it in the best possible way. On the map of Al-Idrisi, the Kim country is located in the ninth and tenth parts of the fourth climate. As in other parts of the map, there is no coordinate network, the scale has not been preserved, geographical objects are shown as schematic geographical figures, the sides of the horizon are shown in reverse order with the current orientation (Kumekov, 1971:194-198; Kumekov, 2015: 18-21).

The next work by B. E. Kumekov is "on the history of the Kipchaks of the 8-14<sup>th</sup> centuries. from the very beginning in Arabic and Persian sources." Here, the scientific and analytical review reveals the information level and the degree of knowledge of the narrative sources covering the history of the medieval Kipchaks. Their history is inextricably linked with the formation of many Turkic-speaking peoples of our country, primarily the Kazakh people. Significant groups of the Kipchak ethnos became part of the Turkic-speaking peoples of the Kirghiz, Karakalpaks, Uzbeks, Tatars, Bashkirs, Transcaucasia, Southern Siberia and Altai (Kumekov, 1987:42).

At the same time, B. E. Kumekov's research examines in detail the fact that the Kipchak tribes left their traces in the history of the peoples of Russia, Georgia, Armenia, Byzantium, Romania, Hungary, Egypt and Syria. The author's publications of the 9-17<sup>th</sup> centuries also consider written monuments in Arabic, Persian and partially Turkic languages, which extend from Central Asia, the Middle East to Spain. Information about them is given according to the exact chronology of the subscription. For the first time, such an extensive set of Muslim written sources on the history of the Kipchaks was considered by a single analysis (Kumekov, 2021:136).

### **Conclusion**

Thus, the scientific research of the outstanding Russian historian and orientalist, academician B.E. Kumekov, analyzed by us, testifies to his great contribution to the development of the following scientific directions.

Firstly, brilliant basic Oriental studies, high knowledge of Arabic and Persian sources played a significant role in the formation of his professional skills in the field of medieval history of Kazakhstan. He is one of the largest Russian researchers of the ethnogenesis and ethnic history of the Kipchaks, including the formation of the state, relations with neighboring peoples, and participation in world trade routes during the 8–14<sup>th</sup> centuries. This is evidenced by numerous scientific publications of the scientist in the field of scientific knowledge indicated by us – in the study of the Kipchaks. They are also supported by the functioning of the International Institute of Kipchak Studies created by him.

Secondly, it was academician B.E. Kumekov who managed to bring his outstanding role to the world historical and oriental science- the discovery and development of the ethnogenesis and ethnic history of the Kimaks, as well as the Kimak Khaganate of the 9–10<sup>th</sup> centuries on the territory of Kazakhstan. At the same time, the author relies on the original early medieval Muslim sources as the main source on the history of the Kimaks. At the same time, thanks to the author's research,

we have received new information about the peculiarities of the socio-economic and state life of the Kimaks. These scientific discoveries of his were carried out during his work at the Institute of History, Archeology and Ethnography named after Ch.Ch. Valikhanov of the Academy of Sciences of the Republic.

Thirdly, the scientific developments of Academician B.E. Kumekov included "The History of Kazakhstan from ancient times to the present day" (1977-1980 and 2010) in 5 volumes, as well as in a more complete version of the "History of Kazakhstan" published next 2025 in 7 volumes. He, together with other colleagues known to the scientific community, published textbooks "Medieval History of Kazakhstan (6-17<sup>th</sup> centuries)" for grades 7-8 in Kazakh and Russian.

Fourth, the scientist professionally combined research and teaching activities at the historical faculties of the Al-Farabi Kazakh National University (Almaty) and the Eurasian National University (Astana). It was this combination of professional knowledge that contributed to the fact that he managed to prepare 4 candidates and 5 doctors of historical sciences and one PhD for Kazakh science.

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# ДРЕВНИЙ РИМ И СОВРЕМЕННОСТЬ

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## Аннотация

Апеннинский полуостров, простирающийся к Средиземноморью морю на юге Европы, с древних времен был известен как Италия. Культуры Терра – Марра, Нураги и Вилланова доказывают, что эта территория была заселена со времен палеолита. Народы, говорящие на разных языках, включая этрусков и латинян, жили на упомянутой территории и оставили после себя богатое наследие. Изучение этого наследия позволяет правильно понять события, происходящие в современном мире. Древность и современность объединены именно в истории Рима. Изучение этой истории определяет основные направления развития как древнего, так и нового времени, устраняет ошибки и опасность гибели человечества.

**Ключевые слова:** Рим, Италия, история, культурное наследие, современность

## ANCIENT ROME AND MODERNITY

Mehdiyeva Ayten Ali

### Summary

The Apennine peninsula, which stretches towards the Mediterranean Sea in the south of Europe, has been known as Italy since ancient times. Terra Marra, Nuraqi and Villanova cultures prove that this area has been inhabited since the Paleolithic period. Peoples speaking different languages, including Etruscans and Latins, lived in the mentioned area and left behind a rich heritage. Studying that heritage allows us to correctly understand the events happening in the modern world. Antiquity and modernity are united precisely in the history of Rome. The study of this history determines the main directions of development of both the ancient and modern times, eliminates mistakes and the danger of the destruction of humanity.

**Keywords:** Rome, Italy, history, cultural heritage, modern times

В древних цивилизациях государство занимало довольно важное место. А также государство в разные периоды проявляло себя в разных формах. С созданием государства изменилась система отношений внутри общества. Закономерности, возникшие в процессе становления государства как политической структуры, либо разрушались в разные периоды истории, либо совершенствовались вплоть до современной эпохи. Особенно интересно наблюдать за этим процессом, особенно в отношениях государства и религии. В случае с древнеримским государством эти отношения были особенно очевидны. Хотя контроль над государством был особенно сильным во времена Царств и Республики, появление Империи придало ситуации иные оттенки. В первые века новой эры велась подготовка к серьезным изменениям в религиозных процессах, была принята и оформлена Миланским эдиктом новая религия, а после разделения христианства в разных частях Империи оно отличалось друг от друга [ 4 ]. На западе Империи христианство всегда было независимым, создавало собственное государство и даже контролировало всю Европу. В Восточной Римской империи, напротив, христианство попало в зависимость от государства и использовалось в его управлении [ 5 ].

Постепенно усиление политического влияния и правотворческой способности государства изменило государственно – религиозные отношения в Европе, особенно в Риме. В результате в государственном управлении сформировались две основные модели с точки зрения позиции религии в политической жизни государства и наличия законодательной инициативы. В модели светского государства религия отделена от государства, роль религиозных деятелей в правовой и политической жизни государства не учитывается, в

управлении доминируют светские принципы. Эта система, сформировавшаяся в Риме, заняло прочное место и занимает лидирующие позиции в современном мире. В этом отношении римская система светского управления выступает примером для мировых государств современного периода.

### **1. Государственно – религиозные отношения**

В современное время наблюдается напряженность в государственно – религиозных отношениях. История этих отношений имеет древние корни. Если обратить внимание на Западный мир в частности, то можно увидеть яркие примеры этого [ 6, с.10 ]. Таким образом, секуляризм прошел долгую борьбу со времен Древнего Рима и смог сформировать систему, которую мы видим сегодня. По этой причине при анализе процессов, происходящих в мире, очень важно уделять особое внимание истории Древнего Рима.



**Рисунок 1. Раннее христианство в Риме**

Управление многочисленными народами различного этнического происхождения, религиозных верований и культур, проживающими на обширной географической территории, где доминировала Древняя Римская империя, сформировало политическую структуру и правовую систему, основанную на серьезном фундаменте. Древнеримская культура, государственное управление, культура и религиозные мировоззрение, сформировавшиеся на протяжении двенадцати столетий, сохранили свое значение и в новое время, а также составляют основы западной культуры. Оказывая сильное внимание на культуру, языку, литературу, законам и государственного управления, Римская цивилизация претерпевала большое развитие от системы управления Царского и Республиканского к системе Имперского. Христианство, официально принятое в Имперский период, и сегодня оказало значительное влияние на формирование основной идеологии Запада как объединяющего фактора [Рисунок 1].

### **2. Политическая организация Древнего Рима и гражданские права**

Особо следует отметить роль Сената и республиканской системы управления в Древнем Риме. Древнеримская республика, существовавшая в VI – I веках до н.э., известна своими народными собраниями, сенатом и магистратами. Народные собрания принимали законы, а магистраты осуществляли исполнительную власть государства. Эта система впервые сформировала идеи демократии и представительного правления.

Сенат, один из высших государственных органов в Древнем Риме, был основан приблизительно в VI веке до н.э. на основе совета старейшин патрицианских поколений и функционировал как государственный совет [Рисунок 2]. В III веке до н.э. некоторые права Сената были переданы народным собраниям (комиссиям). В III – I веках до н.э. в обязанности Сената входило предварительное рассмотрение законопроектов, военного дела, внешней политики, финансовых дел, государственного имущества и т.д. Влияние Сената было очень велико для своего времени, и он долгое время считался главной опорой римской администрации. Во времена Империи права Сената были ограничены, и Диоклетиан превратил его в римский городской совет [ 3, с.324- 327].



**Рисунок 2. Римский Сенат**

В римской политической системе права граждан постепенно расширялись. Специальные трибуны избирались для представления плебеев и защиты их прав. Это был один из первых примеров идеи представительства, оказавший большое влияние на современную европейскую демократию.

Современные системы парламентской и представительной демократии основаны на римских принципах управления. Римский сенат сегодня считается основополагающим примером парламентов и политических структур многих стран. Также идея создания баланса между исполнительной и законодательной властью зародилась еще в Древнем Риме [ 2, с. 84 – 100 ]. Принципы римского управления нашли отражение в Конгрессе США, Британском парламенте, Национальном собрании Французской Республики и законодательных органах других стран. Римские правовые и политические идеи играют важную роль в управлении современным обществом. В наше время Верхняя палата Конгресса США и Национальной Ассамблеи Французской Республики называется Сенатом [Рисунок 3].



**Рисунок 3. Французское Национальное собрание**

### **3. Древнеримская и современная правовые системы**

Древнеримская правовая система была сформирована писанными законами. Важнейшим документом были Законы двенадцати таблиц (лат. *Leges Duodecim Tabularum*) (451 – 450 гг. до н.э.). Эти законы заложили основу для равного применения закона ко всем.



Рисунок 4. Leges duodecim tabularum

Основными принципами римского права считались: «Все равны перед законом», «При наличии сомнений предполагается невинность» и т.д. Эти законы заложили основу для возникновения европейского права в современную эпоху.

Эти законы, составленные в V веке до н.э., считаются основным источником права в Риме и получили название «XII Табличных Законов», поскольку были написаны на 12 деревянных табличках [Рисунок 4]. Даже подростки, пополнившие ряды горожан, были обязаны знать законы наизусть. Этот документ, необходимый в основном плебеям, был создан в результате написания обычных прав. Однако до нашего времени они не дошли и сведения о них получены лишь благодаря трудам античных авторов. Среди этих источников можно назвать учебник, написанный юристом Гаем, автором II века до н.э., для школ римского права. Согласно слову «civitas», что означает «город», «городская община», «XII Табличных Законов» назывался гражданским и понимался как законы, принадлежащие гражданам [ 1, с.204 – 206 ].

Римское право составляет основу современных правовых систем, особенно европейского права. Система гражданского права (Civil Law) непосредственно вытекает из римского права и в настоящее время широко распространена во всем мире. Принципы справедливости и права в международном праве заимствованы из римского права.

#### 4. Влияние древнеримской экономики на современную экономическую систему

Экономика Древнего Рима состояла из сельского хозяйства, торговли и услуг. Во времена Римской империи землевладельцы и армия играли важную экономическую роль. Были развиты торговые пути и морская торговля, был широко распространен обмен товарами внутри империи [Рисунок 5]. Римская денежная система опиралась на обращение монет, необходимых для сетевой торговли и экономики. Римские монеты использовались во внутренней и внешней торговле. Современные денежные системы и финансовые структуры уходят корнями во времена Римской империи.



Рисунок 5. Римские города и деньги в период Империи

Римская экономика напоминала современные экономические системы, особенно с расширенной торговлей и инфраструктурой. Налогообложение Римской империи было основным средством удовлетворения финансовых потребностей правительства. Налогообложение товаров и услуг лежит в основе современных налоговых систем. Центрами римской экономики считались торговые центры (форумы, порты) и международная торговля [Рисунок 6].



Рисунок 6. Римский Форум

## 5. Древнеримские технологии и современность

### а) Римские дороги



Рисунок 7. *Omnes viae Romam ducunt* (Все дороги ведут в Рим)

В Древнем Риме была распространена фраза «Все дороги ведут в Рим» (лат. *Omnes viae Romam ducunt*) [Рисунок 7]. Дорога была впервые построена в Риме, там и зародилось это выражение. В Риме вымощали камнем, и через каждый километр ставили каменный столб. На первых построенных дорогах движение было левосторонним и носило безопасный характер. Дороги в Риме были построены высочайшего качества и сохраняются до наших дней. По всей территории Римской империи была создана прекрасная дорожная сеть протяженностью от 300 000 до 400 000 км. В наше время с римскими дорогами могут сравниться только дороги, построенные в Германии. Эти дороги имели большое значение для торговли, военного дела и связи. В основе современных систем дорог и автомагистралей лежат римские дороги [Рисунок 8].

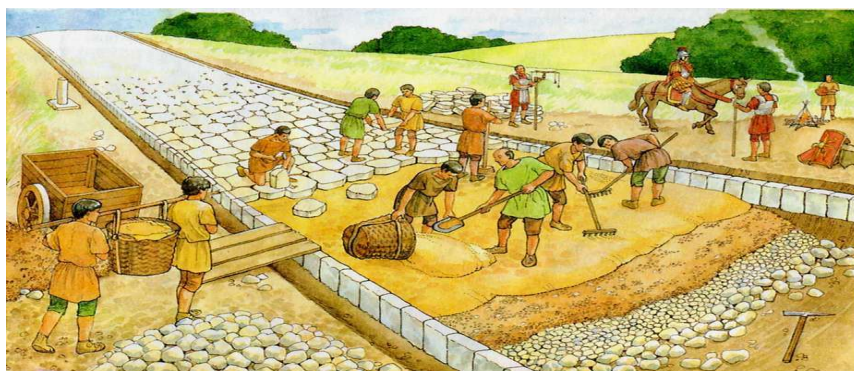


Рисунок 8. Прокладка дорог в Риме

#### б) Водопроводные и канализационные трубы

Римляне доставляли чистую воду в города через акведуки. Системы канализации обеспечивали санитарию и создавали здоровые условия жизни в городах. Современная городская инфраструктура водоснабжения и канализации вдохновлена Римом [Рисунок 9].

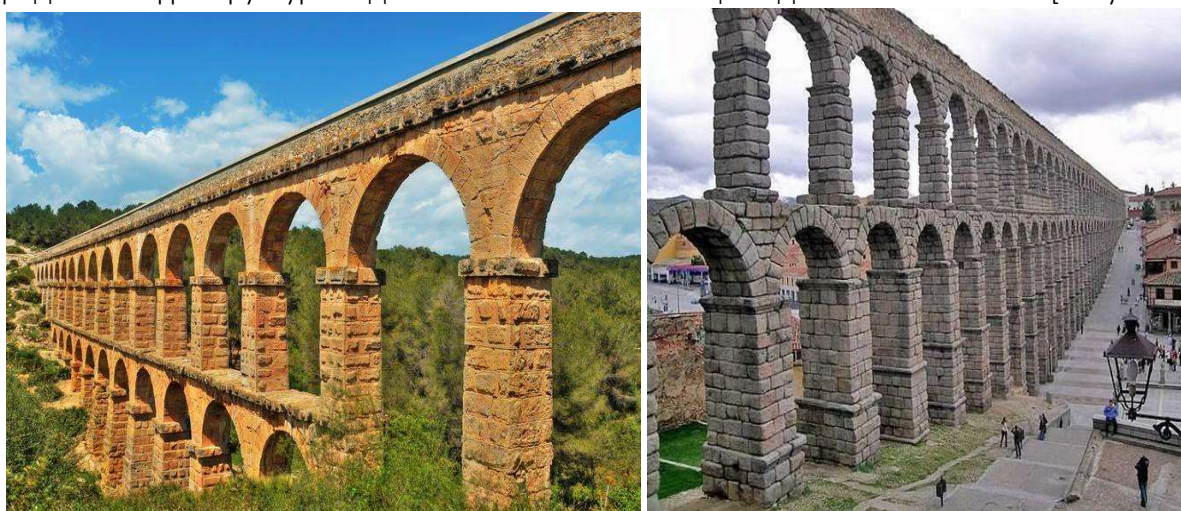


Рисунок 9. Римские акведуки

#### в) Архитектурные технологии

Римляне использовали такие технологии, как арки, купола и бетон. Великолепные здания, такие как Пантеон и Колизей [Рисунок 10], являются техническими достижениями этого периода. Следы римских технологий сохранились в современной архитектуре и строительстве.



Рисунок 10. Римский Пантеон и Колизей

Таким образом, в современное время дороги и транспортная система строятся по модели римских дорог, римские инновации применяются в инфраструктуре водоснабжения

и канализации, а в современной строительной отрасли широко используются бетонные и арочные технологии.

## 6. Влияние культурных достижений Древнего Рима на современную мировую культуру

### а) Латинский язык

Латынь, официальный язык Древней Римской империи, положила начало многим современным языкам и по сей день. Латинский язык, в частности, повлиял на развитие языков латинского происхождения (испанского, итальянского, французского, португальского, румынского). В наше время латинский язык продолжает широко использоваться в научной, юридической и религиозной сферах.

### б) Римский календарь

Римский календарь во многом связан с современным григорианским календарем. Деление 365 – дневного года и 12 – месячная система были взяты из римского календаря [Рисунок 11]. Календарь Римской империи заложил основу системы измерения времени и годично – календарных систем в современных обществах.

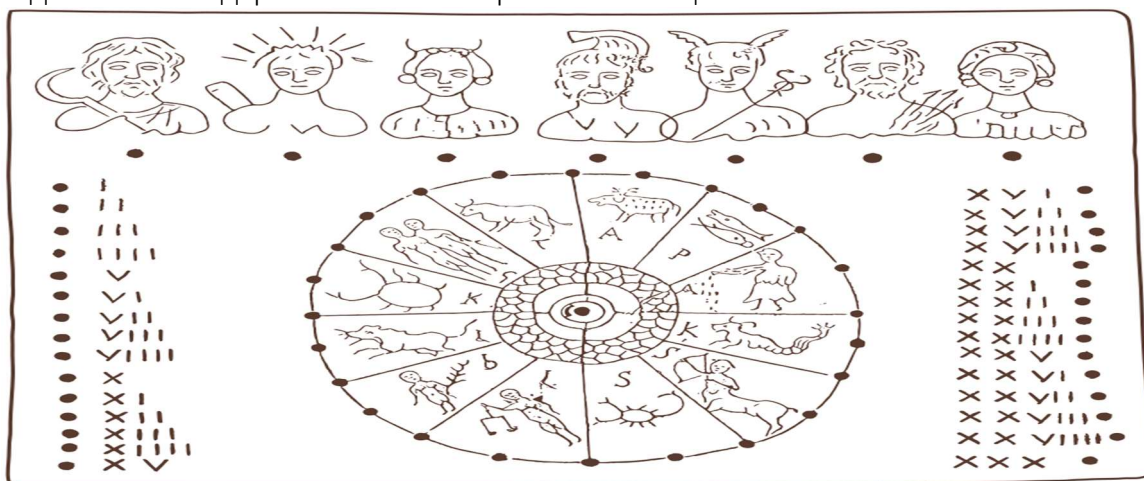


Рисунок 11. Древнеримский каменный календарь

## 7. Факторы, повлиявшие на падение Римской империи и современные катаклизмы

Обращает на себя внимание мысль о том, что период упадка Римской империи, начавшийся с кризиса III века, совпал с периодом относительного холода и засухи. Изменение климата является одним из важных факторов, влияющих на римскую экономику. Серьезные изменения произошли во время Великого переселения народов в IV – VII веках [Рисунок 12]. Исследования, проведенные учеными Кембриджского университета, доказали, что сильные засухи создали условия для перемещения племен, живших на границах с Римской империей. Такая же ситуация наблюдалась и в центральных частях Европы. Во время нападений гуннов в V веке летние месяцы были чрезвычайно засушливыми [8, с. 86-90].



Рисунок 12. Wolfgang Behringer. Kulturgeschichte des Klimas. München: C.H.Beck, 2007

Но преувеличение последствий изменения климата в прошлом может привести к ложному впечатлению, что антропогенное изменение климата сегодня не является серьезной проблемой. Аргументы такого типа, скорее всего, создадут условия для того, чтобы нынешние климатические дебаты шли в неправильном направлении [ 7 ]. Мы не ошибемся, если скажем, что ослабление Римской империи, серьезные ошибки в государственном управлении, изменения в международном мире, усиление конкурентов и т.д. стали причиной падения этого государства. Изменение климата является одним из факторов, влияющих на этот процесс.

Таким образом, следов древней римской цивилизации, давшей бесценную культуру мировой истории, можно найти в каждой сфере жизни общества. Проведение подобных исследований, с одной стороны, служит изучению древней истории, с другой стороны, доказывает, что человечеству важно выбрать правильное направление в своем развитии. Несмотря на все достижения римской цивилизации, допущенные ею ошибки сделали ее падение реальностью.

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## Pedagogical Sciences

УДК: 371.315

# ГИБРИДНОЕ ОБУЧЕНИЕ: СОВРЕМЕННЫЕ ИНФОРМАЦИОННО-КОММУНИКАЦИОННЫЕ ТЕХНОЛОГИИ С ИСПОЛЬЗОВАНИЕМ ТРАДИЦИОННЫХ МЕТОДОВ ОБУЧЕНИЯ

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**Аннотация.** Гибридное обучение сочетает современные информационно-коммуникационные технологии и традиционные методы, что позволяет эффективно развивать образовательные процессы. В статье рассмотрены преимущества и вызовы такого подхода, а также предложены рекомендации по его внедрению.

**Abstract.** Hybrid learning combines modern information and communication technologies with traditional methods, enabling the effective development of educational processes. The article examines the advantages and challenges of this approach and provides recommendations for its implementation.

**Ключевые слова:** гибридное обучение, информационно-коммуникационные технологии, традиционные методы, образование, цифровизация.

**Keywords:** hybrid learning, information and communication technologies, traditional methods, education, digitalization.

Гибридное обучение представляет собой синергетический подход, сочетающий в себе лучшие элементы традиционного образования и цифровых технологий. Оно возникает на пересечении классических методов преподавания и современных информационно-коммуникационных технологий (ИКТ), позволяя создавать уникальные образовательные стратегии.

Актуальность данного подхода обусловлена изменениями в образовательной среде, вызванными цифровизацией и потребностью в гибких формах обучения. В условиях ускоряющегося научно-технического прогресса традиционные методы обучения не всегда успевают соответствовать новым требованиям. Гибридный формат позволяет не только сохранить их сильные стороны, но и интегрировать достижения современных технологий, такие как онлайн-платформы, виртуальные симуляторы и интерактивные ресурсы.

Гибридное обучение становится всё более популярным благодаря своей универсальности. Оно позволяет удовлетворить потребности учащихся разных возрастных групп и образовательных уровней, начиная от школьников и заканчивая студентами вузов и слушателями профессиональных курсов. Учитывая все преимущества и вызовы данного подхода, его внедрение требует тщательного анализа и планирования.

Современные информационно-коммуникационные технологии (ИКТ) Современные ИКТ являются ключевым компонентом гибридного обучения. Среди наиболее распространённых инструментов можно выделить:

1. **Онлайн-платформы:** образовательные платформы, такие как Moodle, Google Classroom и Edmodo, предоставляют возможность создавать курсы, загружать материалы, проводить тестирования и отслеживать успеваемость студентов. Они также способствуют развитию самостоятельности у учащихся.
2. **Видеоконференции:** инструменты Zoom, Microsoft Teams и Google Meet позволяют проводить лекции, семинары и консультации в режиме реального времени, обеспечивая интерактивное взаимодействие между участниками.
3. **Виртуальные лаборатории и симуляции:** такие технологии, как виртуальная реальность (VR) и дополненная реальность (AR), дают возможность моделировать лабораторные опыты, эксперименты и практические задачи, что особенно полезно для технических и медицинских дисциплин.
4. **Мобильные приложения:** приложения для изучения языков, подготовки к экзаменам и управления временем обучения (например, Duolingo, Quizlet) значительно расширяют возможности для самообразования.
5. **Искусственный интеллект и чат-боты:** в образовательных платформах активно применяются системы, анализирующие прогресс студента и предлагающие персонализированные рекомендации по обучению.

Эти технологии позволяют студентам получать доступ к обучающим материалам из любой точки мира и в любое время, тем самым увеличивая доступность образования. Примером служит внедрение платформы Coursera, которая объединила студентов и преподавателей из более чем 200 стран.

Традиционные методы обучения Традиционные методы остаются основой образовательного процесса, обеспечивая фундаментальные знания и навыки. Основные традиционные методы включают:

1. **Лекции:** структурированный способ передачи знаний, который позволяет преподавателю передавать большой объём информации за ограниченное время.
2. **Семинары:** формат, стимулирующий дискуссию, обмен мнениями и глубокое понимание изучаемых тем.
3. **Практические занятия:** особенно важны в профессиональном образовании, так как позволяют учащимся применять теоретические знания на практике.
4. **Учебные пособия:** книги, учебники и методические материалы продолжают играть важную роль в подготовке студентов.
5. **Групповые проекты:** способствует развитию навыков сотрудничества и обмена идеями.

Традиционные методы способствуют развитию критического мышления, навыков анализа и устного общения, что трудно воспроизвести исключительно с использованием ИКТ.

Гибридное обучение обладает рядом преимуществ, которые делают его универсальным инструментом образования:

1. **Персонализация образовательного процесса:** гибкость форматов позволяет преподавателям учитывать индивидуальные потребности каждого студента, адаптируя задания и график.
2. **Доступность и гибкость:** студенты могут выбирать удобное время и место для обучения, что особенно актуально для работающих людей и жителей отдалённых регионов.

3. **Интерактивность:** использование видеоматериалов, онлайн-тестов, форумов и чатов помогает удерживать внимание студентов и повышает их вовлечённость в процесс обучения.
4. **Экономическая эффективность:** сокращение затрат на аренду аудиторий и печать материалов делает обучение более доступным для образовательных учреждений.
5. **Улучшение учебных результатов:** интеграция интерактивных методов повышает уровень запоминания материала на 30% по сравнению с традиционными лекциями.

Статистические данные подтверждают эффективность гибридного обучения. Согласно исследованию организации EdTech Research Group, 87% студентов, участвующих в гибридных программах, демонстрируют более высокие результаты в сравнении с традиционными методами обучения. В то же время преподаватели отмечают рост вовлечённости студентов на 65% при использовании интерактивных технологий.

Несмотря на преимущества, гибридное обучение связано с рядом сложностей:

1. **Технические трудности:** отсутствие доступа к стабильному интернету или необходимого оборудования может стать барьером для студентов и преподавателей.
2. **Педагогическая подготовка:** преподаватели должны овладеть навыками работы с цифровыми инструментами, что требует времени и ресурсов.
3. **Самодисциплина студентов:** гибридный формат предполагает высокую степень самостоятельной работы, что может быть сложно для некоторых учащихся.
4. **Безопасность данных:** использование онлайн-платформ требует внимания к вопросам конфиденциальности и защиты информации.

Например, в некоторых образовательных учреждениях, таких как школы сельских регионов, технические трудности становятся критическим ограничением, что требует дополнительных инвестиций со стороны государства и частных организаций. В Финляндии, напротив, государство активно поддерживает программы по улучшению доступа к технологиям, что делает обучение более равным для всех.

Для успешного внедрения гибридного обучения рекомендуется:

1. **Инвестиции в инфраструктуру:** необходимо обеспечить доступ к высокоскоростному интернету и современному оборудованию для всех участников образовательного процесса.
2. **Обучение преподавателей:** важно организовать регулярные курсы повышения квалификации по использованию ИКТ и разработке гибридных программ обучения.
3. **Разработка адаптивных программ:** образовательные программы должны учитывать баланс между традиционными методами и цифровыми технологиями, обеспечивая их интеграцию.
4. **Поддержка студентов:** создание служб поддержки, которые помогут учащимся справляться с техническими и организационными трудностями.
5. **Обратная связь:** регулярный сбор отзывов от студентов и преподавателей для улучшения программ обучения.
6. **Примеры внедрения:** учреждения, такие как Финансовый университет при Правительстве КЗ., успешно адаптировали гибридное обучение, создав мультимедийные курсы и поддерживающую инфраструктуру для своих студентов.

*Заключение.*

Таким образом гибридное обучение представляет собой современную гибкую модель обучения, подразумевающую под собой более тщательную проектировку по сравнению с классическим или полностью дистанционным обучением, а также учитывает персональные подходы к каждому обучающемуся. Успешное внедрение данного обучения требует системного подхода, включающего развитие инфраструктуры, повышение квалификации педагогов и адаптацию учебных программ. Преодоление существующих вызовов позволит использовать все преимущества этого формата, способствуя качественному обновлению образовательной системы.

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# РАЗВИТИЕ ИССЛЕДОВАТЕЛЬСКИХ НАВЫКОВ УЧАЩИХСЯ ЧЕРЕЗ НАПИСАНИЕ АРГУМЕНТАТИВНОГО ЭССЕ

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Развитие исследовательских навыков является одним из приоритетных направлений современной казахстанской школы, что связано с глобальными тенденциями и задачами, которые поставлены в рамках Государственной программы развития образования и науки Республики Казахстан. Развитие данных навыков способствует подготовке конкурентноспособного поколения, которое критически мыслит, самостоятельно осуществляет поиск решений и адаптируется в условиях быстро меняющегося мира. Это позволит школьникам анализировать информацию, выдвигать гипотезы, проводить эксперименты, рефлексировать, делать выводы, что очень важно в условиях четвертой промышленной революции.

А.В. Иванова считает, что развитие исследовательских навыков на уроках русского языка и литературы формируют у учащихся критическое мышление, делая их активными участниками образовательного процесса [1, стр. 125]. Е.С. Петрова, Н.В. Смирнова утверждают, что системное использование проектного и проблемного методов на уроках способствует развитию исследовательской культуры школьников [2, стр. 77]. М.Л. Сидорова акцентирует внимание на учете возрастных особенностей учащихся и междисциплинарного взаимодействия при развитии исследовательских навыков учащихся [3, стр. 216]. Р.И. Кузнецов и А.К. Орлова говорят о необходимости создания условий для самостоятельного поиска решений обучающимися для развития навыков высокого порядка [4, стр. 90].

Научить писать аргументированное эссе - одна из основных целей, которая стоит перед учителем. Результаты анкетирования, проведенного до начала исследования, показали, что «Определяю структуру рассуждения в тексте, нахожу тезисы, аргументы» - ответили 100% учащихся, «Правильно формулирую убедительный аргумент, пример,

микровывод» составляет «Всегда»- от 16% до 31%, «Часто»- 69-84%. «Правильно расставляю знаки препинания, использую причастные и деепричастные обороты, вводные слова»- 44%, «Указываю целевую аудиторию»- 68%. Следовательно, на основе результатов анкетирования необходимо работать над созданием сложной идеи при аргументации, расстановкой знаков препинания, поэтому цель профессионального развития сформулирована «Развитие навыков письма через аргументативное эссе». Исследовательский вопрос: «Как развить навык написания аргументированного эссе у учащихся 9А класса через анализ текстов на уроках русского языка и литературы как второго?» Цель исследования - определить методы, подходы, ресурсы, стратегии, эффективные для развития навыка написания аргументированного эссе. Ожидаемые результаты исследования: все учащиеся знают структуру эссе, формулируют аргументы, выражают свою точку зрения, подтверждают достоверными примерами, пишут заключительную часть эссе, указывают целевую аудиторию, используют сложные синтаксические конструкции и осложненные предложения, кроме этого, сформирован навык оценки собственной и партнерской письменной работы, пишут эссе согласно жанру и требованиям.

Для достижения цели исследования и его ожидаемых результатов учащимся через серию уроков предлагались для анализа сплошные, несплошные тексты, способствующие пониманию языковых, стилистических, лексических, морфологических особенностей жанра, различные виды вступительной части эссе; тексты с элементами повествования/описания, сложные синтаксические конструкции, клише, ресурс «Понятийное колесо». Перед учащимися ставилась задача - написать эссе на основе цитаты, что усложняет работу обучающихся через самостоятельный поиск информации, согласие/несогласие с чьей-либо позицией.

Рассмотрим, как на одном из уроков по русскому языку и литературе в классах с казахским языком обучения можно развивать исследовательские навыки, предлагается один урок из серии последовательных уроков в рамках исследования по Разделу «Глобализация» согласно Учебной программе по русскому языку и литературе NIS-Programme [5,6]. Цели обучения, которые должны достичь девятиклассники - Г5.Участвовать в диалоге по общественно-значимым проблемам, аргументируя свою точку зрения; С4 определять основную мысль; Ч7 извлекать информацию из различных источников; П5.Писать эссе-рассуждение, рассуждение с элементами повествования/описания (объем 120-140 слов) на основе прослушанного/прочитанного текста, выражая свое согласие/несогласие с позицией автора [6]. Учащиеся понимают структуру, жанровые особенности эссе, поэтому на уроке напишут аргументированное эссе на основе цитаты. Межпредметная связь будет осуществляться с экологией, экономикой, что поможет рассмотреть производство джинсов как самое грязное, наносящее вред странам, где они производятся, влияя на окружающую среду и здоровье человека. Использование деятельностного, дифференцированного подходов, стратегий оценивания: взаимооценивания, обратной связи позволило видеть сильные стороны обучающихся, давать конструктивные рекомендации для улучшения согласно целям обучения, ожидаемым результатам исследования, исследовательским навыкам.

На уроке **Задание №1** было направлено на общее понимание темы урока через вопросы о современной одежде, стартер через дискуссию: «Что носят современные люди?», «Существует ли одежда, которую носят все, независимо от национальной принадлежности, возраста, социального статуса?», «В чем популярность джинсов?», «Связана ли популярность с глобализацией?». Это позволило узнать о современных тенденциях в мире моды подростков. При ответе учащиеся отмечали, что «ношение определенной одежды может быть связано с индивидуальным стилем, сезоном, событиями». При заполнении таблицы в **Задании 2** после прослушивания аудиотекста школьники определяли даты,

события, именами, выявляли проблемы, находили решения проблем, формулировали основную мысль прослушанного текста. Оценивание поддерживало обучающихся в выборе основной информации для аргументов, примеров для эссе, которое они напишут позже.

**Задание 3** – выполняли учебно-исследовательский проект через работу в 3-х группах: две из них находили бренды, особенности стиля/описание дизайна, факты, статистику, причины популярности, актуальные и достоверные источники. 1 группа рассматривала страны по производству джинсов в США, Великобритании, Италии, что позволило использовать данные для убедительных аргументов, примеров при написании эссе; 2 группа рассматривала развитие данной промышленности в Казахстане; 3 группа проанализировала текст «Джинсы и экология: можно ли сделать производство денима более «чистым», в котором приводится пример бренда, предпринявшего шаги по созданию более экологичных товаров. Третья группа представила работу через эффективную формулу работы с идеями «И (идеи) + К (комментарии) + М (мнение)», что помогло школьникам при определении личной позиции в поддержку/несогласия с авторской. В **Задании 4** ученикам предлагались 4 цитаты Ив Сен-Лорана, необходимо было выбрать одну из них, что помогло раскрыть предпочтения подростка/возможность выделиться из толпы/приверженность стилю. Ученики писали эссе согласно шаблону для соблюдения структуры аргументированного эссе, который состоял из следующих частей:

Цитата

Согласие/несогласие с автором, выдвижение своей позиции

Аргумент 1 - Пример 1 (на международном уровне) - Микровывод 1

Аргумент 2 - Пример 2 (на республиканском уровне) - Микровывод 2

Аргумент 3 - Пример 3 (на личном уровне) - Микровывод 3

Подведение итогов, общий вывод, подтверждение своей позиции.

Задание было выполнено согласно дескрипторам: выражает свое понимание цитаты, выражает согласие/несогласие, обосновывает свое мнение 3 аргументами, подкрепляет аргументы 3 примерами, делает 3 микровывода, пишет заключение на основе идей, указывает целевую аудиторию, использует сложные конструкции, простые предложения с обособленными членами предложения. После написания эссе учащиеся в парах оценили работу одноклассника и заслушали работу в качестве образца с последующим взаимооцениванием, что развило исследовательские навыки учащихся, предлагая действия по улучшению письменной работы, что говорило о достижении целей урока и ожидаемых результатов исследования.

Таким образом, можно сделать вывод, что методы, приемы, ресурсы, стратегии оценивания хорошо сработали, вовлекли учащихся в активный процесс обучения. Рабочий лист, работа в группах, выбор цитаты помогли работать в зоне ближайшего развития. Анализ текстов в заданиях 2, 3 способствовал использованию информации в качестве аргументов, доказательств для подтверждения своей позиции на личном, республиканском, международном уровнях при написании аргументативного эссе. Шаблон эссе был направлен на соблюдение жанра, озвучивание образца и взаимооценивание способствовали достижению цели обучения П5, ожидаемых результатов исследования, что позволило развивать исследовательские навыки.

Оценивание на уроке обеспечивало достижения целей урока и ожидаемых результатов исследования, говорило о том, что учащиеся умеют объективно оценивать работы на основе четких инструментов оценивания, которые носили объективный характер. Оценивание в группах при выполнении заданий развило навык коллективного обсуждения, когда обучающиеся отбирали ключевые идеи для аргументирования, делись мнениями, обосновывали свои оценки по дескрипторам. Учащимся было предложено внести еще 1 дескриптор к имеющимся. Было предложено «Использует и правильно оформляет

актуальные и убедительные доказательства в виде ссылок на источники сообщения через вводные слова» таких конструкций, как «согласно результатам исследования», «по мнению ученых», что позволило им быть убедительными в своих аргументах, ссылаясь на достоверные источники, правильно расставляя знаки препинания. Группы справились с заданием, выполнив учебный-исследовательских проект.

Оценивание при проверке эссе включало в себя как комментарии учителя, так и обратную связь от одноклассников. Сложные идеи - хороший показатель понимания темы, структуры аргументированного эссе. Три сложные идеи в эссе – это высокая оценка работы при проверке. Например, один из учащихся писал: «Я поддерживаю позицию автора по поводу того, что, если у тебя не выдающихся навыков или умений, ты можешь выделиться своей одеждой. Во-первых, визуальное восприятие людей играет большую роль, что позволяет стать заметнее в обществе. В качестве доказательства можно привести джинсы известных брендов: Gucci, LuiViton, Prada, пользующиеся популярностью у миллионов людей. Они сразу бросаются в глаза, что концентрирует внимание людей на тебя. Следовательно, я считаю, с брендовыми, стильными джинсами человек может быть уникальным в обществе». Чтение эссе одноклассников помогло изучить различные стили письма и способы выражения мыслей, обращалось внимание на использование языковых средств, таких как метафоры, хорошо подобранные слова, что способствовало улучшению навыков собственного письма. Обучающиеся использовали различные типы доказательств при аргументации для убеждения читателя: личный опыт, исторические примеры, сравнительные примеры, цифры и статистику, цитаты авторитетов, примеры из литературы и искусства, эмпирические исследования, примеры из текущих событий. Важно, чтобы примеры были релевантными, убедительными и хорошо связаны с аргументами. Оценивание эссе по дескрипторам развило у учащихся аналитическое мышление через анализ и структурирование информации, отбор аргументов. Дескрипторы помогали в структурировании эссе, формулировании аргументов, подтверждении убедительными примерами, выражении своей точки зрения в письменной форме, синтезировании идей в заключительной части. Они выступили эффективными инструментами для активного развития исследовательских навыков, на уроке учащиеся продвинулись в написании аргументированного эссе, сумели оформить свою позицию («Я считаю, что...», «Моя позиция основана на том, что...»), написали микровыводы, обосновывая свою позицию с помощью вводных слов («Таким образом», «Я считаю»).

Подводя итоги, можно утверждать, что методы, приемы, ресурсы, оценивание помогли в достижении целей обучения, развили исследовательские навыки девятиклассников через выдвижение аргументов, подкрепление тезисами доказательств, обобщение результатов, нахождение путей решения проблемной ситуации.

Вся работа на уроке была направлена на достижение целей урока и ожидаемых результатов исследования, развития исследовательских навыков, в результате чего учащиеся:

1. 100% выполнили задания в достижении целей обучения С2,4, Ч7;
2. на основе анализа текстов предоставили материалы по темам;
3. написали эссе согласно требованиям-шаблону для достижения цели обучения П5;
2. объективно оценили эссе одноклассников, обосновывая выставленный результат;
4. предоставили положительную обратную связь по проведенному уроку об эффективности инструментов оценивания в достижении целей урока и исследования.

На основе оценки результативности урока в рамках исследования практики разработаны:

1. ресурс «Синтаксические конструкции в эссе»;
2. Гид по написанию аргументированного эссе;
3. задания, инструменты оценивания, направленные на развитие навыка аргументированного эссе.

В результате наблюдений, рефлексии, оценки результативности урока на основе планирования, преподавания и оценивания, предложено коллегам использовать:

1. Анкету по выявлению потребностей учащихся;
2. «Понятийное колесо» для поддержки в работе с жанром аргументированного эссе;
3. Шаблон для структурирования и организации эссе;
4. Стратегию «ИМК» в написании микровыводов, комментариев;
5. Чек-лист с дескрипторами эссе для обеспечения четкого, последовательное представления идей, что поможет следовать аргументации автора и понимать его позицию.

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# Виртуалды шынайылық пен жасанды интеллект технологияларын білім саласында қолдану

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## Кіріспе

Мемлекет табысты болуы үшін білім беру ұйымдары негізгі миссиясын сапалы орындау қызметін ұсынуы тиіс, атап айтқанда, жылдам технологиялық, мәдени, экономикалық және демографиялық өзгерістер заманында әлемдік деңгейде бәсекеге қабілетті білім алушыларды қалыптастыруға қабілетті болуы. Заман талабына сай, бәсекеге қабілетті тұлғаны қалыптастырудағы басты жауапкершілік білім беру жүйесіне түседі. Ол жауапкершілікті орындау үшін білім беру ұйымдары, оның ішінде мектептер заманауи технологиялық және инновациялық трендтермен бірге дамумен шектелмей, сол трендтерді өзі қалыптастыратын әлеуеті болуы маңызды. Оқу үдерісін инновацияланған форматта жүргізу, заманауи технологияларды білім саласына интеграциялау жолымен еңбек нарығындағы біліктілік пен құзыреттілік сұранысын қанағаттандыру үшін білім саласындағы зерттеулер болашақ өзекті тақырыптарды анықтап, зерттеу жолымен олардың ғылыми негізділігін анықтауы маңызды.

Инновациялық технологияларды, оның ішінде жасанды интеллектіні түрлі салаларда қолдануды кеңейту қазіргі уақытта мемлекеттік саясаттағы басым бағыттардың бірі. Мемлекет басшысы Қасым-Жомарт Тоқаевтың «Әділетті Қазақстанның экономикалық бағдары» атты Қазақстан халқына Жолдауында «Жасанды интеллектінің мүмкіндіктерін толық пайдалансақ, білім экономикасына тың серпін береміз. Білікті мамандар даярлауымыз қажет. Кемінде үш белгілі жоғары оқу орны жасанды интеллект саласына қажетті кадр даярлаумен және зерттеулер жүргізумен айналысуы керек», - деп атап өтті [1]. Ұсынылып отырған тақырып осы мемлекеттік басымдық аясында маңызды. Демек, оқыту үдерісінде жасанды интеллект мүмкіндіктерін қолданудың маңыздылығы жоғары.

Мұндай зерттеулердің нәтижесі білім беру жүйесіне ғылыми негізделген жаңалықтар мен инновациялардың енуіне жол ашады. Сондықтан, информатика пәнінде мұғалімдер соңғы технологияларды қолдану арқылы осы пәннің әлеуетін жоғарылатады және білім алушылардың пәнге деген қызығушылығын оятады. Осы тұрғыда, информатика пәнін оқытуда виртуалды шынайылық пен жасанды интеллект ресурстарын қолдану өзекті.

Мақалада еліміздің және шет мемлекеттерінің білім беру мекемелерінің оқыту үдерісінде виртуалды шынайылық пен жасанды интеллект ресурстарын қолдану жағдайын анықтау және осы тақырып бойынша жүргізілген зерттеулерге шолу жасау.

Мақалада зерделенген дереккөздерді талдау осы тақырыптың ағымдағы жағдайын және кездесетін кемшіліктерін анықтауға мүмкіндік береді. Жүргізілген талдаулар болашақ информатика мұғалімдеріне және білім алушыларға пайдалы. Сондай-ақ, жүргізілген зерделеудің нәтижесінде информатиканы оқытуда виртуалды шынайылық пен жасанды интеллект ресурстарын қолданудың мүмкіндіктері жан-жақты қарастырылады және мұғалімдердің бұл тұрғыдан біліктіліктерін арттыру қажеттілігі туындайды деп қорытындыланады.

### **Зерттеудің әдістері**

Мақалада виртуалды шынайылық пен жасанды интеллект мүмкіндіктерін оқу үдерісінде қолданудың мүмкіндіктерін қарастыру мақсатында отандық және шетелдік әдебиеттерге және докторлық диссертация жұмыстарына шолу жүргізіледі. Осыған байланысты халықаралық ғылыми қоғамдастық арасында танымал Web of Science Core Collection және Scopus деректер базасында индекстелетін журналдарға жарияланған мақалалар талданады. Сонымен қатар, виртуалды шынайылық пен жасанды интеллекттің білім беруде қолданылуы туралы жазылған докторлық диссертацияларға зерттеу жүргізіледі. Осы жүргізілген жұмыстар барысында, Қазақстан Республикасының Ұлттық академиялық кітапханасы (<http://nabr.kz/> қарастырылды. Сонымен қатар, eLibraryUSA (<https://elibraryusa.state.gov/index.html> ) — журналдар, ғылыми мақалалар, қорғалған докторлық диссертациялардан тұратын Америка Құрама Штаттарының сенімді ақпараттық цифрлық жинағындағы ресурстарға зерттеу жүргізілді.

### **Талқылау мен нәтижелер**

Зерттеу жұмысын талдау барысында виртуалды шынайылық пен жасанды интеллект мүмкіндіктерін оқыту үдерісінде қолдану бойынша 20 шетелдік ғылыми мақалаларға, 5 отандық зерттеушілер жариялаған зерттеулерге, шет мемлекеттерде және елімізде қорғалған докторлық диссертацияларға талдаулар жүргізілді. Мақалаларға талдау жүргізгенде көп ғалымдардың зерттеулерінде осы технологияның артықшылықтарын тұжырымдады. Мысалы, бірқатар зерттеушілер білім алушының қызығушылығын жоғарылатады десе, кейбірі практикалық және шығармашылық дағдыларының дамуына және тақырыпты терең түсінуіне ықпал етеді деп түйіндейді. Мұнда ортақ көрінетін басты сипаттама – құралдарды қолдану оң нәтиже беретін және дәстүрлі оқытуды трансформациялайтын әлеуетке ие екендігін көруге болады. Сондай-ақ, докторлық диссертацияларды қарастырғанда, виртуалды шынайылық пен жасанды интеллект мүмкіндіктерін білім беруде қолдану бойынша тақырыптардың жылдан-жылға саны артып келе жатқаны байқалады. Дегенмен, осы тақырыптар бойынша докторлық диссертациялардың саны біршама төмен екендігін көреміз. Демек, бұл технологияларды оқыту үдерісінде қолдану бойынша елімізде де зерттеулер санын арттыру маңызды.

VR технологиялары адам өмірінің әртүрлі салаларына, соның ішінде білім беру саласына да енгізілген. VR білім беруде пайдалы екені айтылған, өйткені ол күрделі ақпаратты игеруді жеңілдетеді, оқушыларға тақырып бойынша нақты тәжірибе береді, сабаққа оқушылардың назарын арттырады, сабақта қызығушылық пен мотивацияны жоғарылатады. Оқытудың осындай артықшылықтарына байланысты виртуалды шынайылық XXI ғасырдағы оқу құралы болатынын атап өтті [2]. Соңғы жылдары VR технологиясы қол жетімді болды, өйткені оның құны төмендеді, сонымен қатар пайдаланушыларға Unity, Varwin сияқты виртуалды ортаны оңай құруға мүмкіндік беретін әртүрлі модельдеу платформалары қолжетімді бола бастады. Бұл VR қосымшасының таралуы артатынын білдіреді.

Соңғы жылдары осы тақырып бойынша зерттеу жұмыстары мен мақалалар санының артуы білім беруде виртуалды шынайылық (VR) технологиясын қолдану бағытының өзектілігін көрсетеді. Көптеген зерттеушілер VR ортасында студенттердің қабылдауы мен пайдалану тәжірибесін зерттеді. Төмендегі кестеде бірқатар зерттеушілердің тұжырымдамалары көрсетілген

<i>№</i>	<i>Зерттеушілер</i>	<i>Тұжырымдамасы</i>
1.	Калверт және т.б; Пиркер және Денгел	Қабылдау, қатысу, эмоциялар және эмпатия дағдыларына оң әсері дәлелденген [3].
2.	МакГоверн, Морейра және Луна-Неварес	VR технологиясының білім алушылардың презентациялау қабілеттерін жоғарылататынын атап өтті [4].
3.	Богусевщи және т.б.,	Жас оқушылар арасында жүргізілген эксперимент VR қолдану оқу үдерісін қызықты ететінін анықтады [5].
4.	Ходжсон және басқалар, Дайнеко және т.б.	Кейбір зерттеулер VR студенттердің тақырыпты түсінуін арттырады деп болжайды. VR технологиясы сыныпқа енгізілгенде, оқушылардың оқуға және тақырыпты түсінуге қанағаттануы артты [6].
5.	Крокос және т.б.	Оқушылардың көбірек ақпарат алатынын және практикалық дағдыларын арттыратынын анықтады [7].
6.	Солимен және т.б.	VR технологиясының инженерлік білім беру үшін пайдалы екенін анықтады, себебі ол оқушылардың пәндерді түсінуін жақсартуға көмектеседі және зертханаларда өткізетін уақытты азайтады [8].

Жалпы алғанда, VR артықшылықтары студенттердің мотивациясының жоғарылауымен, күрделі және абстрактілі пәндерді түсінуімен, сонымен қатар зертханалық жұмыстарға жұмсалатын шығындардың азаюымен және жаттықтырушылар қауіпсіздігімен негізделеді.

Жылдан-жылға жасанды интеллекттің қолдану әлеуеті кеңейіп, бірқатар салаларда жоғары деңгейде өзгертулер енгізуде. Көптеген салалар, соның ішінде қаржы, аэроғарыш, медицина, заң, көлік, ауыл шаруашылығы сияқты салалар осы технологияны қолданып, жетістікке жетуде. Осының бірі – білім беру саласы екені айқын, себебі бірқатар жаңалықтармен толықтырылуда. Дегенмен, бұл салада жасанды интеллектті қолдану үшін әлі де зерттеу жүргізуі жиі айтылады. Осыған байланысты, бұл туралы бірқатар зерттеушілер өз еңбектерінде түрлі тұжырымдамалар жасаған, оларға тоқталатын болсақ:

№	Зерттеушілер	Тұжырымдамасы
1.	Бен Коппин	Жасанды интеллект (AI) – машиналардың жаңа ортаға бейімделуі, олардың оқи алуы және шешім қабылдауы, туындаған мәселелерді шешу жолдарын табуы, сонымен қатар, адам интеллектісін қажет ететін әртүрлі функцияларды орындай алу қабілеті болып табылады [9].
2.	Идо Ролл және Рудз Уиле	AI білім саласына көптеген мүмкіндіктер ұсынады. Біз AI әртараптандыруымыз керек. Жасанды интеллектті мұғалімдердің тәжірибелерімен, бар ресурстармен және біздің оқушылардың күнделікті өмірімен және міндеттерімен жақсырақ интеграциялануы керек деп нақты айтады [10]. Жасанды интеллектті жан-жақты пайдалану және басқа да цифрлық технологиялармен кіріктіре қолдану маңызды екенін атап кеткен дұрыс.
3.	В Аль-Хайми, Ф Хужайнах, Д Насир, И Альхруб	Жасанды интеллект білім алушыларға жаңа парадигматикалық оқыту жүйелеріне, атап айтқанда, аралас оқыту, орын мен уақытқа тәуелсіз оқыту және ауыспалы оқытуға бейімделуге көмектеседі [11]. Демек, жасанды интеллект құралдары мұғалімнің жауапкершіліктерін оңтайландырады.
4.	Туонг Т.К. Нгуен, Мин Т.Нгуен, Хоанг Т.Транс	Білім беру саласында көптеген AI қолданбалары бар. Мұғалімдердің тәжірибесін, оқыту инфрақұрылымын және кейбір оқу бағдарламасын әзірлеуде жасанды интеллект талдауы қажет болады [12]. Сонымен қатар, бұл технология мұғалімдерге, студенттерге, оқу орын әкімшілігіне оқу және оқыту стратегияларына көмектеседі.
5.	Тиммс М.Ж.	Білім беруде жасанды интеллект мүмкіндіктерін қолдану білім сапасының артуына ықпал етеді. AI технологияларына мұғалімнің қосымша жұмыстарын тасымалдау білім берудегі технологияларды сауатты қолдануға және оқыту әдістерін моделдеуге алып келеді [13]. Бұл бағытты кеңейту осы саланың әрі қарай өрендеуіне әкеледі деп түйіндеуге болады.

6.	М. Серик, С. Нурғалиева, Г. Балғожина	Зерттеушілердің еңбектерінде, жасанды интеллект пен нейрондық желілердің көмегімен практикалық жұмыс жүргізу барысында оқушылардың шығармашылық ойлау деңгейі және тәжірибелік дағдылары артатынын атап өтті [14]. Бұл зерттеуден балалардың жасанды интеллект мүмкіндіктерін қолдануы, олардың сабаққа қызығушылығын және белсенділігін көтеретінін байқатады.
7.	К.М. Мухамедиева, Г.Ш. Нурғазина, Д.Б. Абыкенова, И.Ш. Абишева, Ж.Б.Копеев	Зерттеу барысында авторлар жасанды интеллект элементтерін STEM білім беру бағытында мұғалімдерді даярлауда қолдану тиімді мүмкіндіктер береді деп түйіндеген [15]. Жалпы, зерттеушілер AI технологияларын қолдану, әсіресе STEM, жаңа мүмкіндіктер әкеледі және дәстүрлі оқытуды трансформациялайтынын нақтылаған.

Түйіндей келе, бірнеше шетелдік және отандық зерттеушілердің еңбектеріне шолу арқылы жасанды интеллект мүмкіндіктерін білім беру саласында қолдану туралы зерттеулер жүріп жатқанын, сондай-ақ AI оқыту үдерісінде қолдансақ білім алушылардың пәнге деген қызығушылығын оятуға және мұғалімдерге де пайдалы болатынына дәлелдер келтірілгенін байқаймыз.

Сондай-ақ, виртуалды шынайылық пен жасанды интеллект технологияларын білім беруде қолдану туралы бірқатар шетелдік және отандық докторлық диссертация жұмыстары қарастырылды. Нәтижесінде, елімізде виртуалды шынайылық пен жасанды интеллект мүмкіндіктерін қолдану негізінде санаулы зерттеулер жүргізілгені байқалады. Сонымен қатар, 2000-2023жылдар аралығында жазылған шетелдік докторлық диссертация жұмыстарына [www.proquest.com](http://www.proquest.com) сайтындағы деректерге сүйене отырып шолу жасалды. Жұмыс барысында «virtual reality in education» және «artificial intelligence in education» кілттік сөздерді енгізу арқылы жылдан-жылға бұл тақырыптарда (virtual reality – 259 420, artificial intelligence – 116 625 зерттеу жұмыстары) зерттеу жүргізу өзекті болып келе жатқанын байқаймыз (Сурет 1, 2, 3, 4). Сонымен қатар, алғашқы үштікте көбінесе АҚШ, Ұлыбритания және Канада елдері екенін көруге болады.

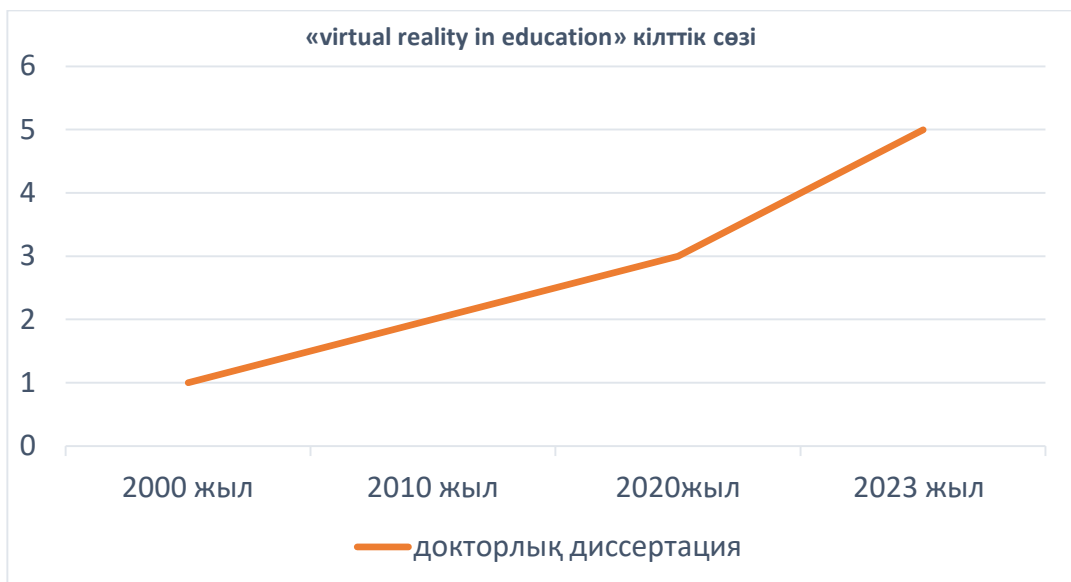


Диаграмма 1 – virtual reality кілттік сөзі бойынша статистика

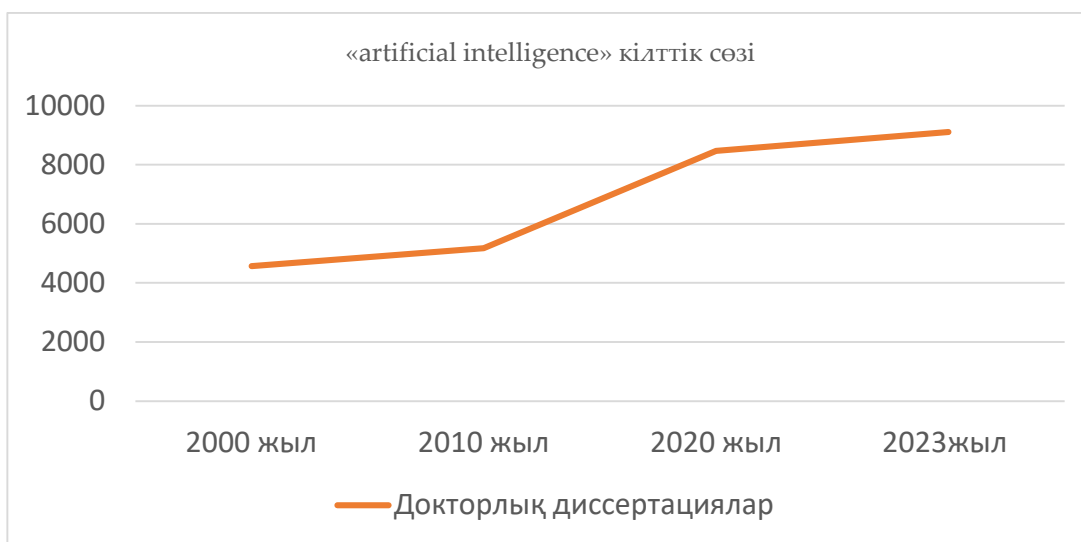


Диаграмма 2 – artificial intelligence кілттік сөзі бойынша статистика

Қорыта айтқанда, жыл сайын инновациялық технологияларды білім беруде зерттеп, тәжірибе жүргізу зерттеушілердің тақырыпқа деген назарын жоғарылатуда. Дегенмен, екі технологияның ресурстарын оқу үдерісінде жеке-дара қарастыратынын байқаймыз. Демек, виртуалды шынайылық пен жасанды интеллект ресурстарын информатика сабақтарында қолдану үшін әлі де жұмыстар жүргізілуі қажет деген болжам жасауға болады.

### Қорытынды

Осы алынған тұжырымдамалар негізінде виртуалды шынайылық пен жасанды интеллект мүмкіндіктерін білім беруде қолдану бойынша ой түйінделді. Қойылған мақсатқа жету жолында міндеттер анықталған, соның бірі, шетелдік және отандық ғылыми зерттеулерді зерделеу. Шолу арқылы виртуалды шынайылық пен жасанды интеллект технологияларының зерттелуі жылдан-жылға күшейіп келе жатқаны байқалады. Дегенмен, бұл технологияларды оқыту үдерісінде қолдану үшін әлі де қиындықтар мен кемшіліктері бар екені көрінеді. Сол себепті, бұл қазірше зерттеу жағынан қызығушылықты оятқанымен тәжірибеден өткізу жағынан көптеген қиыншылықтарға әкеп соғуда. Мысалы, мұғалімдердің біліктіліктері жетіспеуі, технологиялардың шамадан тыс қымбат болуы, ата-аналардың осы технологияларға сыни қарауын да айтып өтуге болады.

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# РАЗВИТИЕ ТВОРЧЕСКИХ СПОСОБНОСТЕЙ УЧАЩИХСЯ В ПРОЦЕССЕ ОБУЧЕНИЯ

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## **Аңдатпа**

Бұл мақалада қазіргі кезде оқыту процесінде оқушылардың шығармашылық қабілеттерін дамыту. Таным процесінің шығармашылық жолы – оқушының өзінің шығармашылық мүмкіншіліктерін көрсетуге қажетті негізгі жағдай ретінде ішкі танымдық мотивация болып табылады.

Оқу процесінде жеке оқушының шығармашылық мүмкіншіліктеріне: шығармашылық процестің ізденіс механизмі, мәсеені айқындауға осы мүмкіншіліктердің өзі, айрықша шешім іздестіру, образды ойлауды өзіндік реттеу жатады. Мұның бәрі де қиял бейнелерінен туындайтындығы белгілі. Олай болса, шығармашылық қабілеттің дамуы – шығармашылық тапсырмаларды шешу қиялдың негізінен жасалады.

**Кілт сөздер:** Оқушы, процес, білім беру технология, қабілет, қиял, шығармашылық.

## **Аннотация**

В данной статье рассматривается развитие творческих способностей учащихся в процессе обучения в настоящее время. Творческий путь познавательного процесса-внутренняя познавательная мотивация как основное условие, необходимое учащемуся для проявления своих творческих способностей. К творческим возможностям отдельного ученика в учебном процессе относятся: поисковый механизм творческого процесса, сам способ определения вопроса, поиск особого решения, саморегулирование образного мышления. Известно, что все это происходит из воображаемых образов. Если это так, то развитие творческих способностей-решение творческих задач осуществляется в основе воображения.

**Ключевые слова:** Учащийся, процесс, образование технологии, способности, воображение, творчество.

## **Abstract**

This article examines the development of students' creative abilities in the learning process at the present time. The creative path of the cognitive process is internal cognitive motivation as the main condition necessary for the student to manifest his creative abilities. The creative possibilities of an individual student in the educational process include: the search mechanism of the creative process, the very way of determining the question, the search for a special solution, self-regulation of imaginative thinking. It is known that all this comes from imaginary images. If this is the case, then the development of creative abilities-the solution of creative tasks is based on imagination.

**Keywords:** Student, process, education, technology, abilities, imagination, creativity.

Развитие системы образования в соответствии со стратегическими направлениями социально – экономического развития страны, основной ориентир интеграции в мировое образовательное пространство – это признание человека как важнейшей ценности

общества, создание условий для развития его духовной души, развития его взглядов и творческого потенциала, познавательной компетентности и культурных ценностей на высоком уровне, формирования личности.

Реализация этих задач требует нового методологического обоснования содержательной действительности процесса обучения в школах страны. Такая новая методологическая система предполагает развитие творческой деятельности обучения и совершенствование передачи содержания образования на национальной основе с точки зрения новой цивилизационной ориентации, указывая на необходимость коренного изменения традиционного процесса обучения.

Главная особенность новых направлений образования заключается в том, что, предвидя результаты обучения, совершенствуя знания и умения учащихся на основе их интересов и любознательности, углубляя их в «фильтр» сознания, ориентируется на постоянное развитие творческого потенциала и формирование стремления к духовному совершенству.

Актуальной темой становится вопрос перехода к 12 – летнему образованию-главному ядру ориентации нашей страны на мировое образовательное пространство. Новая парадигма знаний предполагает удовлетворение познавательных и духовных потребностей и формирование всесторонне развитой, творческой личности, рассматривая ребенка как субъекта учебной деятельности, формируя ценностную ориентацию на знания на основе творческих интересов[1].

Новая организация образовательного процесса требует более глубокого пересмотра его философских, педагогико-психологических основ, теории и практики. Современные философы и педагоги - ученые доказывают необходимость не только внедрения новых технологий и методов обучения в сфере образования, но и пересмотра мировоззренческих позиций в образовании, перехода к духовно-нравственным ценностям.

Сложность и противоречия инновационных процессов в сфере образования делают актуальной проблему формирования творческого интереса учащихся на качественном этапе взаимодействия с новыми явлениями и гуманизации общего среднего образования.

Формирование творческой направленности личности в условиях новой парадигмы образования на современном этапе-непосредственно зависит от творческого интереса учащегося в учебно-познавательной деятельности. Творческий интерес является основным ядром развития качества любознательных способностей личности. Потому что все ценности в жизни признаются только через новаторские направления в результате постоянного творческого интереса к деятельности и получают возможность для жизнеспособного развития в будущем. Поэтому большое значение имеет признание творческой способности как ценности глубинной, мотивационной, познавательной направленности в ее духовном совершенствовании[2]. Применение в учебном процессе ориентированных на учащихся технологий обучения и его обучение в сочетании с передовым опытом является одной из важнейших задач педагогической науки, вытекающих из требований сегодняшнего дня. В связи с этим актуальной задачей современного образования является развитие творческих способностей учащихся.

В Законе Республики Казахстан «Об образовании»:

- развитие творческих, духовных и личностных возможностей личности;
- формирование прочных основ нравственности и здорового образа жизни;
- приобщение к достижениям мировой и отечественной культуры, наряду с интеллектуальным обогащением, путем создания условий для развития личности;
- подчеркнута необходимость изучения истории, обычаев и традиций казахского народа и других народов Республики Казахстан.

В этой связи в Законе Республики Казахстан "Об образовании",

В программах главы государства «Болашак», «Дарын», Послании народу Казахстана «Казахстан – 2030», «государственной программе развития образования в Республике Казахстан на 2011 – 2020 годы» определены вопросы стимулирования и развития одаренности личности, повышения развивающего характера образования в качестве главных принципов государственной политики в области образования и определены приоритетные задачи поставлен в ряд [3].

Одним из способов реализации этих задач является разработка эффективной методики повышения уровня развития мыслительного поля учащихся за счет использования различных рациональных методов и приемов дидактики, активизации их научной познавательной деятельности, мотивации к обучению, получению знаний.

Научно обосновать развитие творчества учащихся в учебном процессе и определить педагогические пути его реализации.

Особенности психического развития учащихся на каждом возрастном этапе, особенно на этапе начальной школы, являются наиболее актуальными в вопросах организации педагогической учебно-воспитательной деятельности.

Анализ психолого-педагогической литературы показал практическое снижение общей структуры способностей. Общая структура способностей. Условия развития Уровень широты и направленности

В формировании творческих способностей у психологов разные взгляды на психологические особенности детей или «Признаки способностей». Описание развития творческих способностей на основе научно-литературной экспертизы можно дать следующим образом.

Умственная работоспособность, общая работоспособность-коэффициент умственной работоспособности выше 120 баллов;

- Особая память;
- Устное понимание и четкое изложение мысли;
- Быстрота речи, богатый словарный запас;
- Вычислительные способности;
- Острота мышления(скорость восприятия)
- Широта восприятия (создание широких композиций с объектом);
- Структура систематических знаний (обработка информации, анализ-синтез, индукция-дедукция);
- Высокостабильный подход - Наблюдательность;
- Когнитивный подход.

Специальные способности-академические (высокие результаты по отдельным предметам);

- Лингвистический (способность использовать язык);
  - Логико-математическая (работа с объектами, символами, знаками);
  - Пространство (работа с образцами, фигурами, рисунками);
  - Музыкальный (исполнение, выпуск);
  - Личностные (умение управлять своими чувствами, различать, анализировать)
- Творчество - понимание проблемы (их узнавание, обнаружение);
- Быстрота (быстрота в генерации различных идей);
  - Гибкость (легкий переход к возможности решения проблемы);
  - Оригинальность (развитие объекта, новые решения, идеи);
  - Воображение (фантазия);
  - Планирование;
  - Принятие решений;
  - Реализация решений, исследовательская активность;

- Эмоциональная активность;
- Чувствовать;
- Аналитические способности (умение оценивать идеи);
- Саморазвитие;

- До того, как достигнуть подлинных решений, оценить поступки и поступки учащегося, нельзя прийти к выводу, что он способен или не способен на это дело. Творческая способность, при которой любой из вышеперечисленных личностных качеств психической специфики учащегося обнаруживается у человека, называется общей способностью. Извилистость и критичность ума, способность быстро вспоминать материал, внимательность и наблюдательность, интеллект и смекалка и т.д. подобные различия, проявляющиеся в умственной деятельности, являются общими творческими способностями [4].

Критерий творческих способностей-продуктивное выполнение определенного дела. Творческие способности могут хорошо отражать пригодность к определенному виду человеческой деятельности, одной из сфер искусства. Сочетание различных личностных качеств человека, то есть синтез человеческих качеств, позволяющих с совершенством выполнять определенное дело, называется творческими способностями.

Особое место в развитии и формировании способностей отводится обучению и воспитанию. Ход развития творческой деятельности зависит от возрастных возможностей детей и характера деятельности.

Существует два способа усвоения знаний, от каждого из которых определяется характер познавательных процессов. Один из способов направлен на активное становление деятельности, приводящей к самостоятельному приобретению новых знаний: от наблюдения ребенком взаимосвязи между предметами до проявления ранее никому не известных закономерностей и новых знаний, вплоть до предшествующих успехов в искусстве. Второй путь направлен на попытку возрождения, которая строится на освоении готовых видеороликов и эталонов. В первом случае речь идет о творческом продуктивном процессе. Критерий креативности зависит от новизны ситуации, средств и способов ее воссоздания, оригинальности полученного результата. Творческие способности учащихся проявляются по-разному во внешних проявлениях и различных интеллектуальных и личностных способностях.

Таким образом, главная цель в формировании творческих способностей учащихся - развитие качественных качеств личности учащихся в условиях новой парадигмы современного образования, формирование компетентности в соответствии с современными требованиями и создание условий для развития духовной души. Поэтому для того, чтобы будущая средняя школа, воспитывающая подрастающее поколение, выполняла возложенную на нее социальную задачу, естественно стремиться к обновлению различных путей образования в соответствии с сегодняшними требованиями. Мы пришли к выводу, что развитие творческих способностей учащихся в процессе обучения возможно только путем изменения содержания образования, форм организации, технологий, направленности субъектов, участвующих в нем, образовательной среды в соответствии с инновационным характером образования.

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# ОСНОВНЫЕ УГРОЗЫ В КИБЕРПРОСТРАНСТВЕ И НЕОБХОДИМОСТЬ ОБЕСПЕЧЕНИЯ КИБЕРБЕЗОПАСНОСТИ

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## **Аннотация**

Кибербезопасность является одной из ключевых проблем современного общества, особенно в сфере образования. В данном докладе рассматриваются понятие и значение культуры кибербезопасности. Обсуждается роль образовательных учреждений в формировании культуры кибербезопасности и её важность для защиты молодёжи от потенциальных угроз. Также представлены основные рекомендации по необходимости развития культуры кибербезопасности для предотвращения угроз в интернете. Исследование направлено на формирование культуры кибербезопасности посредством предоставления конкретных рекомендаций для системы образования.

Современные средства массовой информации и технологии описываются как один из важнейших аспектов быстро развивающегося общества. Они всё чаще интегрируются в повседневную жизнь молодёжи в качестве необходимых инструментов для развлечений, получения образования и профессиональной деятельности. Стремительное развитие технологической инфраструктуры значительно расширило масштабы использования интернета. Эта тенденция потребовала от молодёжи освоения новых способов социального взаимодействия и обмена информацией. Растущая роль интернета в повседневной жизни и его широкое использование как инструмента для организации и реализации различных мероприятий существенно повлияли на традиционные формы социального взаимодействия, ранее осуществляемые в школах или через личное общение [1].

Исследования показывают, что увеличение доступа детей и подростков к онлайн-платформам усиливает их уязвимость к различным угрозам и возможному вреду в киберпространстве. С ростом онлайн-активности молодёжь всё чаще сталкивается с кибербуллингом, онлайн-преследованием, эксплуатацией, слежкой, а также с нежелательным контентом. Более того, такие риски, как кража личных данных, распространение ложной информации, незаконный сбор данных и манипуляция рекламой, представляют значительную угрозу для их онлайн-безопасности. Эти проблемы требуют особого внимания к онлайн-поведенческим аспектам молодёжи и обеспечения соответствующего образования и профилактических мер [2].

В связи с высокими рисками, связанными с использованием интернета, основное внимание было сосредоточено на разработке образовательных программ, направленных на информирование о потенциальных опасностях и повышение цифровой грамотности молодёжи. Это необходимо для их самозащиты и критической оценки их онлайн-опыта [3].

Эксперты в области STEM (наука, технологии, инженерия и математика) считают, что для решения проблемы нехватки кадров в области кибербезопасности необходимо с начальной и средней школы повышать интерес учеников к этой области. Эта проблема

связана с недостаточным уровнем знаний учащихся о кибербезопасности. Поэтому важно внедрять в школах специальные программы, обучающие основам кибербезопасности, и готовить учителей, способных преподавать эту дисциплину. В последние годы особое внимание уделяется повышению цифровой грамотности, так как цифровые навыки являются одним из важнейших требований для работы в области кибербезопасности. В этом контексте широко используются понятия "осведомлённость о кибербезопасности" и "цифровая грамотность." Они описывают уровень понимания принципов безопасности и использования цифровых технологий. Однако дискуссии о том, какие конкретные навыки необходимо развивать в рамках этих понятий, продолжаются. Это подчёркивает важность улучшения качества образования по кибербезопасности в школах и его эффективной организации [4].

"Осведомлённость о кибербезопасности" – это совокупность мероприятий и практик, направленных на защиту сетей, устройств и данных от несанкционированного доступа или криминального использования, а также обеспечение конфиденциальности, целостности и доступности информации. Агентство по кибербезопасности и инфраструктурной безопасности описывает это понятие именно так.

Кроме того, Международный союз электросвязи (ITU) расширяет это определение, рассматривая его как широкое понятие, включающее инструменты, политики, концепции безопасности, меры, руководства, подходы к управлению рисками, действия, обучающие программы, передовые практики и технологии, направленные на защиту цифровой среды, организаций и активов пользователей. Это подчёркивает важность и многогранность кибербезопасности, так как она играет решающую роль в обеспечении стабильности и развития современного информационного общества [5].

Кибербезопасность – это одна из важных составляющих современной жизни общества. Она включает в себя меры, практики и знания, направленные на защиту пользователей от вредоносного контента в интернете. Этот термин охватывает следующие аспекты:

Кибербезопасность – это практика защиты пользователей от вредоносного контента в интернете. Она также охватывает эмоциональные и психологические эффекты информации, которую люди видят, читают или слышат в сети.

Быть кибербезопасным – это означает соблюдать соответствующие стандарты поведения при совместном использовании контента в интернете. Люди должны знать, как избежать вредоносных взаимодействий в сети, и быть готовыми обратиться за помощью в случае непредвиденных обстоятельств.

Примеры инцидентов кибербезопасности:

- Кибербуллинг – действия по травле и оскорблениям в интернете.
- Сексуальные домогательства – публикация личной информации или распространение контента сексуального характера.
- Столкновение с речью ненависти – насилие или материалы, содержащие ненависть.
- Утечка конфиденциальной информации – несанкционированное раскрытие личных или корпоративных данных.
- Личностные оскорбления – действия, наносящие ущерб достоинству или репутации человека.

К действиям и процессам кибербезопасности относятся:

- Защита данных и систем – обеспечение защиты информации и систем в интернете от несанкционированного доступа.
- Безопасность коммуникационных систем – защита сетевых связей от изменений или ограничений в использовании.

- Использование инструментов и технологий – обеспечение безопасности данных с помощью специализированного программного обеспечения и политик.

Значение кибербезопасности заключается в том, что безопасность в интернете не ограничивается только техническими инструментами. Она напрямую связана с осознанным управлением собственными действиями и готовностью защищаться от угроз.

Кибербезопасность – один из ключевых инструментов, обеспечивающих устойчивость и развитие информационного общества. Таким образом, культура кибербезопасности представляет собой совокупность ценностей и практик, направленных на соблюдение принципов ответственности и безопасности при использовании информационных технологий (ENISA, 2021) [6].

Первая стратегия кибербезопасности в Европейском Союзе была принята в 2013 году, после чего она была дополнена и расширена экспертами. Однако особое внимание было уделено вопросам образования в области кибербезопасности.

В декабре 2019 года в отчете ENISA было отмечено, что в ЕС, особенно в странах-участницах, растет нехватка навыков в области кибербезопасности. Последние исследования Акермана (2019) [7], Руиза (2019) [8], Конклина и др. (2014) [9] также акцентируют внимание на данной проблеме.

Мировое исследование 2018 и 2019 годов показало, что в мире наблюдается нехватка около 3 миллионов специалистов по кибербезопасности (Йерман Блажич, 2022) [10]. Эти исследования, однако, не затрагивали средние школы, делая акцент в первую очередь на высших учебных заведениях. Кибербезопасность охватывает широкий спектр профессий и ролей, что усложняет создание унифицированной образовательной программы, включающей все необходимые знания для цифрового общества. Учебная программа должна разрабатываться в соответствии с конкретными потребностями различных секторов. Тем не менее, эксперты сходятся во мнении, что существуют фундаментальные знания и навыки, которые важны в повседневной жизни как для студентов, так и для профессионалов. К таким навыкам относятся критическое мышление и способности к решению проблем (Малан и др., 2018; Карагьянис и Магкос, 2021) [11].

Учитывая разнообразие кибербезопасности, неудивительно, что подходы к образованию в этой области различаются по странам, каждая из которых разрабатывает собственные стратегии. Эти стратегии образования обычно направлены на улучшение общего состояния навыков в области кибербезопасности, включая обновление системы образования. Однако проблема образования на уровне средних школ остается нерешенной. Некоторые исследователи в этой области подчеркнули необходимость всестороннего образовательного подхода, включая дополнительные инструменты и ресурсы, такие как викторины и игры.

Coentrad и др. (2020) [12] изучали потенциал кибербезопасных игр в улучшении образовательного процесса. Они отметили, что такие игры способны предоставить студентам симулированную среду для отработки и улучшения навыков кибербезопасности. Исследования, проведенные в высших учебных заведениях, показывают, что студенты эффективнее учатся, когда активно участвуют в учебных мероприятиях, которые способствуют развитию критического мышления и решению проблем.

Геймификация – методика, внедряющая элементы популярных игр в образовательные модули, доказала свою высокую эффективность в этом отношении (Джин и др., 2018; Карагьянис и Магкос, 2021) [13]. Геймификация за последние десятилетия приобрела популярность как метод стимулирования студентов и улучшения их образовательного опыта. Она предусматривает внедрение различных подходов из игр в образовательные параметры. Решения в области обучения кибербезопасности, включая

игры, доказали свою эффективность в повышении осведомленности, улучшении защитных стратегий и формировании позитивного отношения.

Анализ более 100 доступных на рынке игр по кибербезопасности показал их значительный потенциал (Coentrad и др., 2020; Йерман Блажич, 2021) [14].

Значение обучения в области кибербезопасности в развивающихся странах было исследовано в 2013 году Кортжаном и фон Солмсом, которые использовали Южную Африку в качестве примера. Они подчеркнули важную роль кибербезопасности в защите личностей, бизнеса и национальной экономики.

Статья попыталась сравнить осведомлённость и образование по вопросам кибербезопасности в Южной Африке с развитыми странами. Основываясь на успешных политиках и внедрениях в других странах, развивающимся государствам были предложены определённые ключевые аспекты, которые следует учитывать при планировании образовательных программ в области кибербезопасности.

Критцингер в 2014 году отметил растущую обеспокоенность по поводу онлайн-безопасности в Южной Африке, особенно среди старшеклассников. Из-за увеличения доступности и доступов к ИКТ-устройствам студенты подвергались потенциальным рискам и угрозам, если не защищали себя и свои личные данные. Южная Африка отставала от других стран в вопросах интернет-безопасности. В статье были предложены как краткосрочные, так и долгосрочные решения для повышения онлайн-безопасности южноафриканских студентов и интеграции онлайн-безопасности в классах [15]. Парималам и др. (2020) изучили достоинства и недостатки существующих систем и предложили рекомендации по повышению осведомленности о кибербезопасности. Для сбора данных была предложена методология стратифицированной выборки вероятностного отбора. Результаты были направлены на информирование разработки образовательной программы по кибербезопасности для самостоятельного обучения детей и подростков, а также на продвижение ответственного использования интернета среди пользователей поколения Z [16]. Рахман и др. (2020) обратили внимание на негативные последствия использования интернета, включая азартные игры, порнографию, расовое насилие, кибербуллинг и онлайн-мошенничество. Они отметили, как отсутствие осведомлённости пользователей о протоколах безопасности способствовало этим опасным действиям. Статья была направлена на изучение важности обучения современных студентов опасностям онлайн-активности и предложения методов продвижения кибербезопасности в образовательных учреждениях [17].

**Заключение.** Культура кибербезопасности — важный фактор, обеспечивающий устойчивость и безопасность современного общества. Она включает не только технические знания, но и осознанные действия и ответственность каждого человека. Учебные заведения и инновационные подходы к обучению играют ключевую роль в формировании навыков кибербезопасности.

Развитие цифровой грамотности среди подростков и детей, понимание интернет-угроз и формирование культуры защиты от них — одна из главных приоритетных задач.

Развитие культуры кибербезопасности становится основой для устойчивого и безопасного развития общества.

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# Болашақ бастауыш сынып мұғалімдерінің кәсіби қалыптасуындағы эмоционалдық тұрақтылықтың рөлі

**Амзеева Гульнара Асетовна**

Қорқыт Ата атындағы Қызылорда университеті, Бастауыш оқыту педагогикасы мен әдістемесі білім беру бағдарламасының 3-курс докторанты, Қызылорда қ., Қазақстан Республикасы

Болашақ бастауыш сынып мұғалімдерін кәсіби даярлауды жетілдірудің өзекті бағыты студенттердің эмоционалдық өзін-өзі реттеу қабілетін дамыту болып табылады. Олар психикалық күйлердің ерекше формасы бола отырып, эмоционалдық реакцияның басымдығымен сипатталады.

Қазіргі білім беру процесінде болашақ бастауыш сынып мұғалімдерінің эмоционалдық тұрақтылығын қалыптастыру маңызды міндеттердің бірі, өйткені тұлғаның бұл қасиеті стрессті тиімді жеңуге, эмоционалдық тепе-теңдікті сақтауға және оқушылармен сәтті қарым-қатынас жасауға мүмкіндік береді. Тұлғаның эмоционалдық тұрақтылығын қалыптастыру мәселесі спорт психологиясы, инженерлік және авиациялық психология, педагогикалық психология сияқты психология ғылымының әртүрлі салаларында қарастырылады. Ғылыми әдебиеттерде «психологиялық тұрақтылық», «эмоционалдық тұрақтылық» және «психоэмоционалдық тұрақтылық» сияқты әртүрлі терминдер қолданылады, олардың анықтамалары ұқсас және әртүрлі психикалық құбылыстарды қамтиды. Тұлғаның психологиялық тұрақтылығы тепе-теңдікті, беріктікті, тұрақтылық пен қарсылықты біріктіретін күрделі сапа ретінде анықталады. Шетелдік психологтар психологиялық тұрақтылықты төзімділік көрсеткіштері арқылы сипаттай отырып, жеке фактордың маңыздылығын көрсетеді. Американдық психологтар С.К. Кобаза және Р. Пусети төзімділіктің келесідей көрсеткіштерін бөліп көрсетеді:

1. Бақылау - төзімді адамдар өз өмірлерін бақылайды және төтенше жағдайларда мінез-құлық түрін таңдай алады және жағдайды бақылай отырып, оған ықпал ете алады.
2. Басқалармен және өзімен қарым-қатынас - бұл қатынастар өздерінің құндылықтарын, мақсаттарын мен өмірлік басымдықтарын анықтайды.
3. Өзгерістерді құндылық ретінде бағалау - тұрақты тұлға өзінің икемділігін, табандылығын сезінеді және қолдауды қайдан табуға болатынын біледі [1].

Эмоционалдық тұрақтылық мәселесі ғылымдар жүйесіндегі негізгі мәселелердің бірі болып табылады. Бұл қасиет жеке адамға эмоционалдық әсерлерге қарсы тұруға мүмкіндік береді, бұл іс-әрекеттің барысына теріс әсер етуі мүмкін. Бұл мәселе болашақ бастауыш сынып мұғалімдерінің кәсіби қалыптасуы үшін ерекше өзекті мәселе болып табылады. Физиология, психофизиология және нейрофизиология, психиатрия салаларында эмоционалдық күйлерді жүзеге асыруға жауап беретін физиологиялық, эпигенетикалық, жеке және әлеуметтік механизмдерді, сондай-ақ эмоционалдық және мінез-құлық мәселелеріне әсер ететін факторларды зерттеуге бағытталған өзекті зерттеулер жүргізілген. Мысалы, Г. Гиз, Л.М.Кениг, Д. Тот және басқа т.б. ғалымдардың зерттеулері жоғары калориялы тағамдарды жарнамалау оларды тұтынуды ынталандыруы мүмкін екенін көрсетті. Бұл жағдайда дұрыс емес диетаға бейімділік пен өзін-өзі бақылау мәселесі арасындағы байланыс анықталды: өзін-өзі бақылаудың жоғары деңгейі бар субъектілер

әдетте дұрыс тамақтануды таңдайды. Осылайша, тұтынушылардың мінез-құлқына әсер ететін сыртқы (жарнама) және ішкі (өзін-өзі бақылау) факторлар анықталды. Осы саладағы қосымша зерттеулер жеке тұлғаның эмоционалдық тұрақтылығын арттыруға бағытталған әдістер мен стратегияларды дамытуға ықпал етуі мүмкін, бұл өз кезегінде адамның әртүрлі салаларына, соның ішінде кәсіби және жеке өміріне оң әсер етуі мүмкін [2].

Н.А. Аминова, М.В. Журавкова, И.А. Зимняя, В.А. Крутецкий, С.В.Кондратьева, Л.М. Митина, А.А. Реан және т.б. авторлардың зерттеулерінде педагогикалық қызмет эмоционалдық стресске бейім мамандықтың бірі екендігі қарастырылған. Білім беру процесінің тиімділігі ғана емес, сонымен қатар мұғалімдердің де, оқушылардың да психологиялық әл-ауқаты мұғалімдер мен оқушылар арасындағы қарым-қатынастың сапасына байланысты [3].

Поляк психологы Я. Рейковский эмоционалдық тұрақтылық тұжырымдамасын қарастыра отырып, эмоционалды ынталандыруға сезімталдық параметрін қамтиды және кейбір адамдар төмен эмоционалды сезімталдықтың арқасында эмоционалдық тұрақтылықтың жоғары деңгейіне ие болады деп санайды [4].

Н.А. Аминов жүйке жүйесінің сезімталдығы мен эмоционалдық тұрақтылық арасындағы байланысты көрсетеді, алайда жүйке жүйесі әлсіз, яғни сезімтал адамдар жоғары эмоционалдық тұрақтылықты көрсетеді және өз эмоционалдық реакцияларын басқара алады. Осылайша, эмоционалдық тұрақтылық кейбір жағдайларда жүйке жүйесінің төмен және орташа қарқынды сигналдарға жауап бере алмауынан туындауы мүмкін, ал басқаларында сезімтал адамдар өздерінің эмоционалдық күйіне назар аударуды және басқаруды әдетке айналдырған кезде адаптивті копинг стратегиясын дамыту арқылы пайда болуы мүмкін.

В.А. Крутецкий мұғалімнің эмоционалдық тұрақтылығын эмоционалды шиеленіс жағдайында кәсіби қызметті нәтижелі жүзеге асыруға мүмкіндік беретін психикалық қасиет ретінде қарастырады [5].

Л.М. Митина эмоционалдық тұрақтылықты бейімделуді сақтай отырып, әртүрлі педагогикалық және психологиялық қиындықтарға төтеп беру қабілеті ретінде анықтайды және бұл сапаны педагогикалық қызмет үшін кәсіби маңызды деп санайды [6].

А.А. Реан мұғалімнің жұмысындағы стресстің көріністері әр түрлі және ашуланшақтық, мазасыздық, шаршау және эмоционалдық жану синдромын қамтиды деп атап өтті.

Эмоционалдық тұрақтылық құбылысын зерттей отырып, Л.М. Аболин оның пайда болуы мен даму факторларының екі негізгі тобын анықтайды: сыртқы (объективті) және ішкі (субъективті). Сыртқы факторларға экстремалды тітіркендіргіштер, стресстер және эмоционалды жағдайлар сияқты экстремалды жағдайлар жатады. Ішкі факторларға физиологиялық реактивтілік (эмоционалдық қозғыштық), жүйке жүйесінің қасиеттері (күш, қозғыштық, тепе-теңдік) және адамның тұрақты психологиялық сипаттамалары (мазасыздық, экстраверсия-интроверсия, ерікті бақылау, мінез акцентуациясы) жатады.

П.Б. Зильберманнның пікірінше, тұрақтылық өзгерген жағдайдың сәйкес келмеуі мен икемділік пен бейімделудің жеткіліксіздігін көрсететін орынсыз құбылыс болуы мүмкін.

А.А. Чекалина пікірі бойынша, психикалық күйлер саласында эмоционалдық тұрақтылық, жағымсыз эмоциялармен күресу және қуану адам денсаулығының көрсеткіштері болып табылады [7].

Л.А. Китаев-Смык, В.Л. Леви, Р.А. Макаревич, В. Г. Казанская мұғалімдердің эмоционалдық тұрақтылығының төмен деңгейі эмоционалдық күйзеліске және әртүрлі психосоматикалық ауруларға әкеледі деп санайды.

Зерттеу барысында эмоционалдық тұрақтылықтың антонимі ретінде эмоционалдық тұрақсыздық құбылысын қарастырған жөн. Дж. Гилфорд эмоционалдық тұрақсыздықты қозғыштық, пессимизм, мазасыздық және көңіл-күйдің өзгергіштігі деп түсіндіреді. П.Фресс

өз кезегінде эмоционалдық тұрақсыздыққа (невротикалық) жоғары сезімталдықта, сондай-ақ қозғыштық, өзін-өзі бағалау және бақылау деңгейінде көрінетін эмоционалдылықтың негізгі сипаттамасы ретінде назар аударады. Р.Б.Кеттелл және оның әріптестері невротиалық симптомдар мен гипохондрианың жоқтығын, тыныштық пен қызығушылықтың тұрақтылығын сипаттайтын «аффективті төзімділік» ұғымын енгізеді. Р.Б.Кеттелл әдістемесіне сәйкес, «эмоционалдық тұрақсыздық – эмоционалдық тұрақтылық» факторы эмоциялардың динамикалық жалпылануы мен жетілуін көрсетеді. Осы тәсілдерді талдау негізінде эмоционалдық тұрақтылық эмоционалдық, еріктік, интеллектуалдық және мотивациялық компоненттерді қамтитын тұлғаның күрделі қасиеті деп қорытынды жасауға болады. Бұл қасиет стресстік жағдайларда тиімді жұмыс жасау және шамадан тыс эмоционалдық қозуды жеңу қабілетінде көрінеді. Осы зерттеу шеңберінде педагогикалық қызметке тән шиеленіс пен стресс жағдайында тиімді мінез-құлыққа ықпал ететін педагог тұлғасының кәсіби сапасы ретінде қарастыру перспективті болып табылады.

Қазіргі зерттеушілер «адам - орта» жүйесіндегі кәсіби қызмет үшін эмоционалдық тұрақтылықтың маңыздылығын атап көрсетеді. Л.М. Аболин эмоционалдық тұрақтылықтың негізгі критерийлерін ең алдымен адамның кәсіби қызметінен іздеу керек екенін атап өтті. Психологиялық әдебиеттерде мұндай критерийлерге қызметтің сәттілігі немесе тиімділігі, қозғалыс әрекеттерінің кеңістіктік-уақыттық өлшемдері (жылдамдық, дәлдік, жиілік, ритм және т.б.), эмоционалдық тәжірибенің оңтайлылық дәрежесі және эмоциялардың сапасы жатады.

М.Н. Прозорова эмоционалдық тұрақтылықты педагогикалық мамандықтардың негізгі кәсіби қасиеттерінің қатарына қосу қажеттілігін атап көрсетеді. «Адам – адам» жүйесі шеңберінде адамдарға деген мейірімділік, жанашырлық, эмпатия мен қызығушылық жоғары эмоционалдық тұрақтылықпен, төзімділікпен, өзін-өзі бақылаумен және өз сезімдерін басқара білумен үйлесуі керек. Адамдармен жұмыс көбінесе стрессті қамтиды және дамыған коммуникативті ғана емес, сонымен қатар эмоционалдық-еріктік қасиеттерді де қажет етеді. «Адам-адам» жүйесіне жататын мұғалім мамандығы жоғары эмоционалдық шиеленіс пен жүктемемен сипатталады. Педагогикалық қызметтегі эмоционалдық шиеленіс жұмысқа қабілеттіліктің төмендеуінде, нәтижелердің нашарлауында көрінуі мүмкін. Педагогикалық қызметтің стресстік факторларына эмоционалдық тұрақтылық мұғалімнің маңызды кәсіби сапасы болып табылады, өйткені ол жеке тұтастықты сақтауға мүмкіндік береді, ішкі үйлесімділікке, психикалық денсаулыққа және жұмысқа қабілеттілікке ықпал етеді. Эмоционалдық тұрақсыздықтың алдын алу және жеңілдету дағдыларын қалыптастыру студенттік кезден басталуы керек. Осы саладағы зерттеулерді Л.М. Аболин, Б. Г. Ананьев, Ю.С. Бабахан, Н. В. Витт, М.И. Дьяченко, П. Б. Сильберман, Д.В. Иванов, О.О. Косякова, В.М. Писаренко, В.А. Пономаренко және басқа ғалымдар жүргізді. Олар студенттердің эмоционалдық тұрақтылығын денсаулықты қамтамасыз етудің маңызды шарты ретінде қарастырды [8]. Эмоционалдық тұрақтылық туралы ғылыми зерттеулердің көптігіне қарамастан, жоғары оқу орны студенттерінің эмоционалдық құрамдас бөлігі және оның болашақ кәсіби қызметтегі рөлі, кәсібилендіру процесінде болашақ бастауыш сынып мұғалімдерінде эмоционалдық тұрақтылықты қалыптастыру тетіктері, сондай-ақ олардың негізгі құзыреті ретінде эмоционалдық тұрақтылықты қалыптастыру бағдарламалары жеткіліксіз зерттелген.

Студенттерді кәсіби даярлауда эмоционалдық тұрақтылығын қалыптастыру мәселесі маңызды және мамандандырылған педагогикалық- психологиялық әдістер мен шарттарды қолдануды талап етеді. Осы шарттардың ішінде мыналарды бөліп көрсетуге болады:

- психофизиологиялық сипаттамаларды, эмоционалдық тұрақтылықты, сондай-ақ студенттердің эмоционалдық жағдайларын диагностикалау ерте кезеңдерде жағымсыз көріністерді болжауға және алдын алуға мүмкіндік береді. Студенттерді эмоционалдық күйін

басқарудағы психологиялық және кәсіби құзыреттіліктерін арттыру жолдары туралы білімдермен қаруландыру;

- эмоционалдық тұрақтылық пен кәсіби құзыреттілік бір-бірімен тығыз байланысты: кәсіби құзыреттілік деңгейі неғұрлым жоғары болса, студенттердің стресстік жағдайларда өзін-өзі реттеудің тиімді стратегияларын таңдау мүмкіндігі соғұрлым жоғары болады;

- эмоционалдық күйлерін реттеуде практикалық тәжірибені қалыптастыру, бұл студенттердің стресстік жағдайларда тиімділігін едәуір арттырады және олардың болашақ кәсіби қызметінде табысқа жетуіне ықпал етеді. Оқыту процесінде жалпы эмоционалдық тұрақтылықты дамытуға бағытталған мамандандырылған әлеуметтік-психологиялық тренингтер өткізу арқылы қол жеткізіледі.

Жоғарыда айтылғандарды ескере отырып, болашақ бастауыш сынып мұғалімдерінің эмоционалдық тұрақтылығын қалыптастыруды зерттеуге бағытталған педагогикалық-психологиялық зерттеулер айтарлықтай қызығушылық тудырады. Аталған педагогикалық-психологиялық шарттарды іске асыру болашақ бастауыш сынып мұғалімдерін кәсіби даярлау процесін оңтайландыруға ықпал етеді. Жоғары оқу орындарында оқу кезеңінде студенттердің эмоционалдық тұрақтылығын қалыптастырып, дамыту олардың кәсіби қызметтегі әлеуметтік өзара әрекеттесуге тән эмоционалдық күйлерін реттеудің тиімді әдістерін сәтті таңдауына ықпал етеді.

Қорытындылай келе, психологиялық тұрғыдан тұрақты деп сипатталатын адам әртүрлі стресстік әсерлерге қарсы тұру үшін жеткілікті ресурстарға ие болуы тиіс. Болашақ бастауыш сынып мұғалімдерінің эмоционалдық тұрақтылығын қалыптастыру жоғары білімнің маңызды міндеттерінің бірі болып табылады. Болашақ мамандардың табысты, нәтижелі кәсіби қызмет жасауы үшін қажетті жеке қасиеттердің дамуына ықпал ететін тиісті педагогикалық-психологиялық жағдайлар жасалу қажет. Студенттердің эмоционалдық тұрақтылығын қалыптастыруға ықпал ететін педагогикалық-психологиялық шарттарды анықтау және іске асыру олардың кәсіби қызметтегі эмоционалдық реттеу қабілетін дамытуға және жетілдіруге бағытталуы керек.

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# ON ANALYSIS OF SCIENTIFIC CONCEPTS RELATED TO ETHNOPEDAGOGY

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**Abstract.** The article justifies the necessity of studying ethnopedagogical problems in the modern era, characterized by the convergence of cultures, the clash of economic interests, the emergence of difficulties in protecting national interests, and the gradual disappearance of ethnic characteristics. For this purpose, attention is paid to determining the essence of ethnopedagogy and its place in the system of pedagogical sciences.

The article also attempts to define the basic concepts of ethnopedagogy. The article expresses an attitude towards the clarification of concepts such as “ethnos”, “ethnic knowledge”, “ethnic culture”, which are also the object of research of many other humanities. The article clarifies the concepts of “ethnopedagogical knowledge”, “ethnopedagogical culture”, and determines the mutual relationship between folk pedagogy and ethnopedagogy. Keywords: ethnos, ethnopedagogical culture, ethnopedagogical knowledge, folk pedagogy, ethnopedagogy. Globalization, which has emerged as one of the objective manifestations of human development, covers all areas of modern life. Globalization, which has deeply penetrated the social life of modern societies, can cause positive and negative changes in the lives of countries and peoples, depending on the level of cultural development.

**Keywords:** *ethnopedagogy, ethnopedagogical culture, economic interests, folk pedagogy, scientific concepts, etc.*

The convergence of cultures, the clash of economic interests, the emergence of difficulties in protecting national interests, the gradual disappearance of ethnic characteristics should be accepted as characteristic features of modern life. The gradual deepening of these factors creates a threat of the collapse of the original cultures of peoples and the destruction of ethnoses. Along with the above-mentioned aspects, globalization has caused a “shaking”, awakening, and revival of all nations, even ethnic cultures that are losing their vital existence. T.G. Stefanenko calls this phenomenon the “ethnic paradox of the modern era” and writes that “in individual individuals and entire nations, interest in their ancestral roots manifests itself in a variety of forms, from the restoration of past customs and traditions, the folklorization of professional culture, the search for the “mysterious national spirit” to the creation or restoration of their national statehood.” (4.)

The partial loss of material and spiritual wealth as a result of conflicts on national grounds and inter-country local wars shows that the people as a whole have not properly mastered their national values, and have not considered the use of rich national and spiritual values created over many centuries to be the most important condition for their vital existence. The analysis of the tasks set by the grandiose reforms carried out on the path of independent statehood clearly shows that such an attitude to national spiritual values can be explained by the underestimation of traditional national culture, folk pedagogy, and the possibilities of using them in the upbringing of modern youth by educators, educators, and society in general. Every nation that strives to preserve its national identity should think about preserving, preserving, and further developing its ethnic culture by adapting it to the modern era, and should try to find solutions. In this matter, the socialization of the ethnic consciousness of the nation, the acquisition of ethnopedagogical culture, play a very important role. The problems of socialization of ethnic consciousness, the formation of ethnic culture should be studied by ethnopedagogy, along with various social

sciences, and, in our opinion, with a heavier special weight. Why do we claim that ethnopedagogical research plays a special role in solving these problems? Because all other related sciences examine ethnos, ethnic unity, ethnic culture, etc. from a scientific and theoretical point of view and present them as a fact. Ethnopedagogy, on the other hand, determines the importance, role and ways of applying these in the formation of the personality of people, especially the younger generation, in the modern era. The unique ethnic qualities of each ethnos also form the basis for the formation of a people and nation with original characteristics. Nationality is also a key factor in the sciences that study these characteristics. From this point of view, ethnopedagogy, which deals with the problems of studying ethnic characteristics, is also a national science; for example, Azerbaijani ethnopedagogy, Chuvash ethnopedagogy, Kazakh ethnopedagogy, etc. Since “ethnopedagogy” (mainly and more) arose from pedagogy, it studies the facts and phenomena studied by the science of pedagogy, but in a unique, specific aspect. It is known that the second part of the concept of “ethnopedagogy” - “pedagogy” - is the science that studies the pedagogical process. Therefore, the uniqueness of ethnopedagogy, the fact that it has different characteristics, is connected with the “ethno” part of this concept. (1, 23)

Thus, the first concept that needs to be clarified is “ethnos”. Let us say from the beginning that it has not been possible to give a complete scientific explanation of what ethnos is, a very complex phenomenon, to this day. All sciences whose object of study is human society try to investigate the problem of ethnos, and at the same time each science gives priority to aspects specific to its subject. Our main goal in this article is to generalize the studies conducted on ethnos, its characteristics, and ethnic culture in terms of the problem under study. The first studies that approached the concepts of ethnos and ethnic unity from a theoretical perspective are the collection of articles by the Austrian sociologist E. Francis entitled “Ethnos and Demos” and the work of the Genevan professor Aldo Dami “Determination of Ethnic Unity”.

An interesting idea about ethnos belongs to L.N. Gumilyov. He views ethnos not as a social, but as a natural - geographical phenomenon. “Ethnos is a particular human collective that has a special internal structure and original stereotype of behavior and sets itself against other similar collectives (“we” and “others”)” (5, 285). The Russian philosopher Y.I. Semyonov has interesting ideas about ethnos and ethnic associations. Speaking about the signs of ethnos, he shows that for a long time the main signs of ethnos were considered to be a psychological basis manifested in linguistic unity, territorial unity, economic life unity and cultural unity. Although the fact that the main sign of ethnos is language is justified in one sense (for example, members of the Russian ethnic community are the only ethnos that speaks Russian. As well as Turkish, Finnish, Japanese, etc. ethnos), on the other hand, this sign does not justify itself when applied to the English, Spaniards, Germans, French. There are numerous ethnos that speak each of these languages; for example, Spanish is spoken not only by Spaniards, but also by Mexicans, Cubans, and Argentines, who are completely different ethnos. Indeed, language becomes an important sign for the ethnos at that time, when it plays an important role in the formation and development of cultural unity.

In Azerbaijan, the problem of “ethnos” has been studied more in the context of ethnopolitical processes. Although the study of the problems of various ethnoses living in our country began mainly in the 50s of the 20th century, serious research in this area has a more scientific character after independence. Among the research scientists, R. Mehdiyev, A. Dashdemirov, V. Abdullayev, A. Taghiyev, M. Shukurov, H. Orujov, V. Habiboglu, I. Jafarzadeh, V. Arzumanli, S. Khalilov, I. Agayev and others have paid some attention to the explanation of the concept of “ethnos” in their studies on national policy, national relations and the development of ethnopolitical processes. For example, according to I. Agayev, “ethnos means the unity of people of the same ethnic origin, regardless of their territorial distribution.” (2, 18). Nizami Jafarov calls the people a “super ethnos”: “Azerbaijanis as a people (super ethnos!) were formed as a result of

complex ethnic processes lasting more than a thousand years in a rather “uneasy” geography of the world from a socio-political point of view” (3, p.5).

Ethnos is a special type of social grouping that emerged as a result of natural-historical development, regardless of the will of people. The characteristic feature of an ethnos is its durability; an ethnos is a group of people who can maintain their existence for many centuries. Each ethnos has its own internal unity and special features that distinguish it from others. The strength of unity within an ethnos depends on the characteristics of people’s ethnic self-awareness. These features manifest themselves in various areas of the lifestyle of members of the ethnos. Three stages of development of ethnos are discussed: subethnos (also called primary ethnos, and each member of the ethnos becomes a member of a separate subethnos), subsequent ethnos (subethnos moves to the background, a single literary language is created based on one of the dialects), and the last ethnos (elitist, urban culture is created, national culture is formed). At this stage, all people become members of the ethnos directly, without entering subethnos and ethnic groups. One of the important features of the ethnos is language, which is the main means of communication between its members. Another sign of the existence of the ethnos is cultural unity. This includes, first of all, material culture of a mass nature, such as places of residence, types of economy and equipment, clothing, types of food, and spiritual culture, such as customs, folk art, religion, etc. The cultural unity of the members of the ethnos is closely related to their psychological characteristics. Ethnos is a social phenomenon accompanied by biological connection. In our opinion, the main features of the ethnos include language and cultural unity, awareness of ethnic origin, and unity of ethnic consciousness. Thus, in our opinion, historically formed stable associations of people with common characteristics in terms of language, culture, customs, psychological makeup, awareness of their ethnic origin, and common ethnic consciousness can be called ethnos. One of the concepts related to ethnos is the concept of "ethnic unity."

Folk pedagogy combines three important ethnopedagogical concepts: “pedagogical culture of the people”; “main factors of folk education” and “ethnopedagogical materials”... The concept of “ethnopedagogical materials” means cultural samples created by the people in connection with different spheres of social life, having a deep pedagogical content and value” (1, 50-51). According to Z.A. Khusainov, ethnopedagogical knowledge is the knowledge reflected in fairy tales, legends, songs, riddles, proverbs, parables, lullabies, rhymes, etc., and used in the education and upbringing of children. Professor of Karakand State University Sh.A. Mukhtarova, speaking about ethnopedagogical knowledge, writes: “By ethnopedagogical knowledge, we understand the integrated knowledge about the characteristics of the ethnos’ pedagogical traditions, aimed at the formation of the national self-awareness of the personality, and in professional pedagogical education, also the ethnopedagogical competence (competence) of future teachers.

Speaking about ethnopedagogical knowledge, K.J. Kojakhmetova believes that ethnopedagogical knowledge performs three functions: - it serves to create ideas about reality and the general ethnic situation in the world; - this knowledge serves to determine the direction of a person’s practical and spiritual activity; - ethnopedagogical knowledge helps to understand and recognize the complex system of kinship relations, the essence of ethnosocial roles and the regulation of relations between subjects of the ethnos by these roles, as well as the generation to which one belongs.

As can be seen, researchers view the concept of ethnopedagogical knowledge as part of ethnocultural concepts, as knowledge reflecting the characteristics of pedagogical traditions, including the natural-climatic characteristics of the region, national-cultural and historical originality. G. Nezdemkovskaya calls knowledge about the natural, historical, cultural and social life of ethnos (and therefore humanity as a whole) ethnopedagogical knowledge. This idea can be justified when approaching the issue from the perspective of the first component of the concept

of “ethnopedagogy”. That is, it is accepted that there are various types of knowledge about ethnos. However, this knowledge is formed by various sciences in accordance with their subjects.

One of the concepts that needs a detailed explanation in connection with ethnopedagogy is “ethnopedagogical culture”. For a serious analysis of this concept, it is necessary to understand what pedagogical culture is in general. Since the end of the 20th century and the beginning of the 21st century, numerous studies have been devoted to the study of such problems as pedagogical culture, the formation of the pedagogical culture of future teachers, the pedagogical culture of parents, the characteristics of pedagogical culture in the modern era, etc. It is also possible to find studies in this area in the Azerbaijani scientific pedagogical environment. The content and essence of pedagogical culture can be briefly presented as follows: “Pedagogical culture is essentially a high level of development of personal qualities and professional training that meets the requirements of the work of a teacher and educator and ensures its highest level of efficiency” (3, 147)

Researchers mainly talk about four levels of development of pedagogical culture: pre-professionalism, the initial level of professionalism; average level of professionalism; higher level of professionalism. In our opinion, the first and most important condition for mastering pedagogical culture at the higher professional level is to have “innate” pedagogical qualities. That is, one can master general pedagogical culture by working on all structural units, receiving education, and learning, but if a person does not have an innate desire to teach and educate, or the germs of pedagogical enlightenment, he cannot master pedagogical culture at the higher professional level. In order to educate his students as highly moral personalities, this is the level of pedagogical culture that must be present. The content of pedagogical culture can include the following: - pedagogical inclinations and interests of the teacher-educator; - pedagogical abilities (these are also of two types: social-pedagogical abilities and special pedagogical abilities); - special pedagogical preparation; - pedagogical skill (pedagogical technique, pedagogical tact, creativity, methodological level, etc.) - personal pedagogical labor culture In order to present the concept of “ethnopedagogical culture” in more detail, attention should also be paid to what “ethnic culture” is. Ethnic culture is a system of values formed on the basis of the national psychology, customs and traditions, awareness of ethnic affiliation and language unity of any ethnos, ethnic unity and ethnic group. The “ethnopedagogical culture” that arises from the organic connection of these two concepts should be understood approximately as follows: Ethnopedagogical culture is an indicator of the level of development of personal qualities and professional training that meet the requirements of pedagogical work and ensure its high efficiency in accordance with the national psychology, customs, ethnic identity and language unity of any ethnos. A few words about the concepts of “ethnopedagogy” and “folk pedagogy”. Folk pedagogy, its subject, means, methods, and features have been widely discussed in the scientific and pedagogical literature. In this article, we will try to briefly discuss the general and specific aspects and mutual relations of folk pedagogy and ethnopedagogy.

The fundamental work “Azerbaijani Pedagogical Studies” written by Professor Farrukh Rustamov, which has been evaluated as an event in the Azerbaijani pedagogical environment in recent times, has become a very valuable contribution to our science. The title of the work proves the national nature of the science to which it belongs. In our opinion, one of the values of this work is that it serves to understand the Azerbaijani pedagogical science as a complete system. In my opinion, Azerbaijani pedagogical studies consist of the unity of three sciences that have an independent subject of study, methods and laws: general pedagogy, history of pedagogy and ethnopedagogy. That is, ethnopedagogy is one of the components of pedagogy as an independent science. Until recently, ethnopedagogical studies consisted of generalizing the experience of any individual people in the field of education and were descriptive in nature. Since comparative studies were not conducted in the study of the pedagogical heritage of individual peoples, these

studies were based on almost the same theory and methodology. All this makes it undeniable that a comprehensive study of ethnopedagogical problems will have a positive impact on the development of modern pedagogical science, on the establishment of education on folk, national foundations. In our opinion, there is a great need for serious study of ethnopedagogical problems in the field of Azerbaijani pedagogical science.

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## Economic Sciences

# ETHICS AND SOCIAL RESPONSIBILITY IN BUSINESS

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### ABSTRACT.

The article examines ethics and social responsibility in business as key factors for sustainable company development. It explores the fundamental concepts of business ethics and corporate social responsibility (CSR), their interrelation, and their impact on an organization’s reputation, trust, and success. Examples of practical implementation of ethical principles and CSR projects are provided both internationally and in Kazakhstan. The article also discusses the challenges faced by companies striving to balance profitability with their responsibility to society. It highlights the importance of ethics and social responsibility in shaping sustainable and socially oriented businesses.

**KEYWORDS:** business ethics, social responsibility, corporate social responsibility (CSR), business ethics, sustainable development, transparency, integrity, company reputation, environmental responsibility, social projects, Kazakhstani business.

### INTRODUCTION

In today's world, business plays a significant role not only in the economy but also in society's life. Companies have evolved from being mere providers of goods and services to becoming active participants in social and environmental processes. In this context, the concepts of ethics and social responsibility are of particular importance.

Business ethics refers to a set of moral principles and standards that govern the behavior of organizations and their employees in the course of their business activities. It encompasses aspects such as honesty, fairness, respect for the rights of others, transparency, compliance with laws, and consideration of the interests of all stakeholders (partners, customers, employees, and society as a whole). Ethical behavior helps strengthen a company's trust and reputation, which are essential conditions for its long-term success [1].

Social responsibility in business (or corporate social responsibility, CSR) is a concept in which companies voluntarily undertake obligations to society that go beyond their direct economic interests. Social responsibility can manifest in various forms, such as supporting charitable projects, reducing harmful environmental impacts, ensuring decent working conditions, and assisting in the development of local communities, among others [2].

Ethics and social responsibility are closely intertwined: ethics provides moral guidelines for a company's actions, while social responsibility reflects its practical commitment to adhering to these principles in its activities. Together, they form the foundation for sustainable and socially-oriented business practices.

The importance of ethics and social responsibility has grown in the context of globalization, intensified competition, and increasing societal expectations from businesses. Today, companies are evaluated not only by their financial performance but also by their contributions to public welfare, environmental sustainability, and honest business practices.

This article explores the key aspects of ethics and social responsibility in business, emphasizing their importance for the sustainable development of companies in the modern world. The first section discusses the basic concepts of business ethics, its principles, and examples of ethical and unethical behavior.

The article also highlights the interrelation between ethics and social responsibility and the advantages of adhering to these principles, including improved company reputation, attraction of investors, and strengthening of corporate culture. The conclusion addresses the challenges faced by companies in balancing profitability with social responsibility and underscores the significance of these concepts in shaping a successful and socially-oriented business.

## THE CONCEPT OF BUSINESS ETHICS

Business ethics is a set of moral principles and standards that regulate the behavior of companies and their employees in the business environment. It establishes standards that define which actions are right and fair when conducting business.

Ethical behavior in business is based on adherence to several key principles that guide companies and their employees in decision-making and interactions with the world around them. The main principles include:

### Honesty

- **Essence:** Honesty implies straightforwardness, sincerity, and truthfulness in all aspects of business activities. It involves rejecting deceit, manipulation, and falsehood.
- **Example of Application:** A company provides truthful information about the quality and features of its products or services without inflating customer expectations.

### Fairness

- **Essence:** Fairness involves treating all stakeholders equally, avoiding discrimination or bias. This applies to employees, customers, partners, and suppliers.
- **Example of Application:** Fair distribution of responsibilities and rewards among employees and equal treatment of all customers regardless of their social status or nationality.

### Transparency

- **Essence:** Transparency means openness in a company's activities, providing accessible and truthful information about its operations, especially in financial and legal aspects.
- **Example of Application:** A company publishes reports on its activities, environmental initiatives, or charitable projects, offering clear information to stakeholders.

### *The Importance of These Principles*

**Building Trust.** By adhering to these principles, businesses strengthen the trust of their customers, partners, and employees.

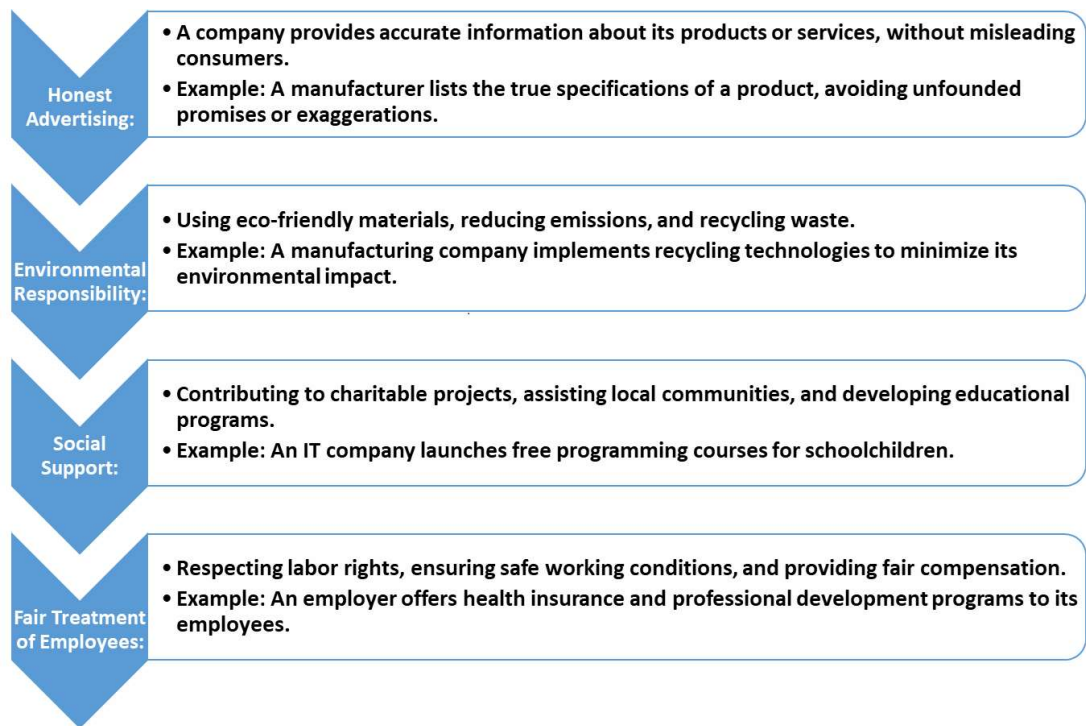
**Improving Reputation.** Companies that act honestly, fairly, and transparently gain a positive image in the market.

**Minimizing Conflicts.** These principles help prevent disputes and negative situations involving dissatisfied stakeholders.

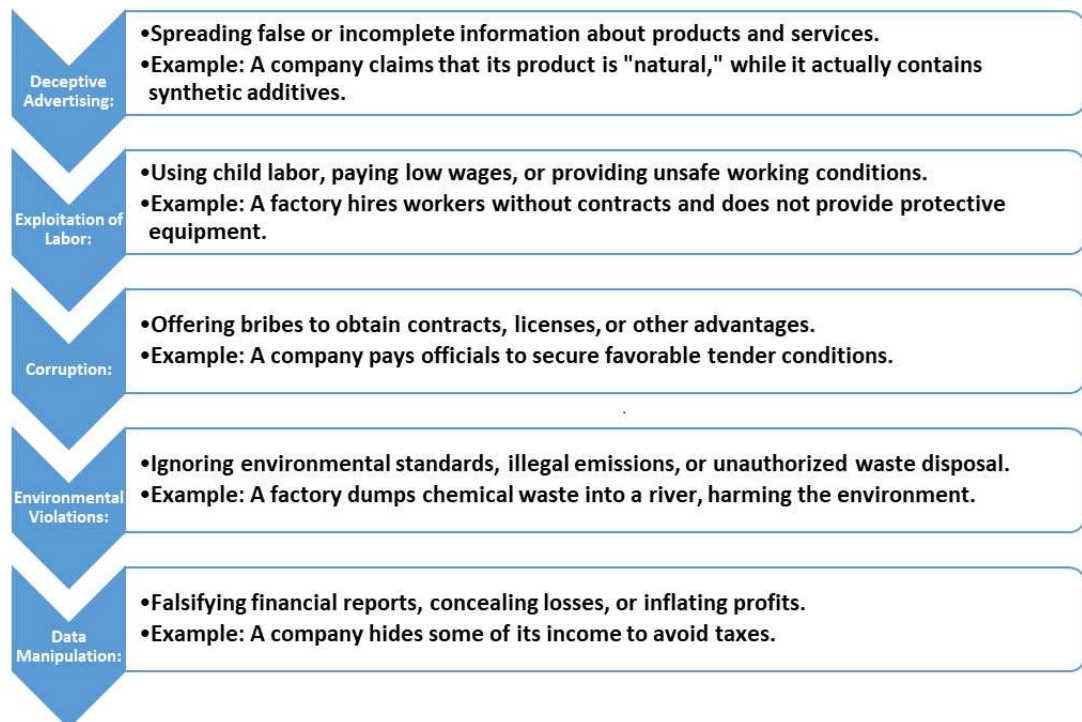
Following these principles not only ensures ethical business practices but also contributes to long-term success and sustainability.

Business ethics is expressed through the real actions of companies and their employees. Examples of ethical behavior foster trust and success, whereas unethical actions can lead to loss of reputation, fines, and even business closure.

### *Examples of Ethical Actions in Business*



### Examples of Unethical Actions in Business



Unethical actions can lead to legal consequences, damage to reputation, and loss of customers and employees. On the other hand, ethical companies gain competitive advantages because they earn the trust and respect of society.

Ethical behavior is not only an obligation but also an investment in the long-term success of the business.

### CORPORATE SOCIAL RESPONSIBILITY (CSR)

Corporate Social Responsibility (CSR) is a concept in which companies voluntarily take on obligations to society beyond their direct economic activities. CSR aims to improve the social, environmental, and economic conditions of society by implementing initiatives that benefit not only the business but also all stakeholders: employees, customers, local communities, and the environment.

*Key Areas of CSR*



*The Importance of Corporate Social Responsibility for Business:*

**Strengthening Reputation:** A socially responsible company gains more trust from customers, partners, and investors.

**Attracting Talent:** Modern employees prefer companies that share their values and care about social justice.

**Customer Loyalty:** Consumers are increasingly choosing brands that actively support environmental and social initiatives.

**Long-term Development:** Companies that follow sustainability principles maintain competitiveness in the face of global changes.

*Examples of Corporate Social Responsibility:*

**International Level:** IKEA uses eco-friendly materials and supports tree-planting projects.

**Kazakhstan Level:** KazMunayGas implements infrastructure development programs in regions and supports local communities [3].

CSR is not only a moral obligation but also a strategic tool to enhance competitiveness, sustainability, and harmonize the relationship between business and society.

## THE CONNECTION BETWEEN ETHICS AND SOCIAL RESPONSIBILITY

Business ethics and corporate social responsibility (CSR) are closely intertwined, as both concepts aim to achieve harmony between the interests of the company, society, and the environment. Ethics establishes the moral guidelines upon which social responsibility is built, and CSR, in turn, is the practical embodiment of ethical principles in business.

Ethical principles (honesty, fairness, respect for people and nature) set the standards for business conduct. Without adherence to ethical norms, social responsibility loses its significance, as it becomes either a formal practice or one aimed solely at improving the company's reputation.

Example: A company that declares environmental responsibility but conceals its actual harmful emissions violates ethical norms, even if its activities appear socially responsible on the surface.

Corporate social responsibility (CSR) allows companies to implement ethical principles through specific actions. This applies to both internal company policies (relationships with employees and partners) and its impact on society and the environment.

Example: An ethical approach to labor is manifested in CSR through the creation of safe working conditions and providing equal opportunities for all employees.

Ethics sets the direction: Business social initiatives are based on ethical norms that define what is right and acceptable.

Social responsibility strengthens reputation: Implementing ethical principles through CSR enhances trust in the company from clients, employees, investors, and society.

Long-term sustainability: A business that follows ethical principles and practices CSR reduces the risk of conflicts with society and government.

Increasing trust: Compliance with ethical standards strengthens the company's reputation, boosting loyalty from clients and partners.

Competitive advantage: Companies that demonstrate their social responsibility are more attractive to consumers who are value-oriented.

Ethics and social responsibility form a whole: Ethics sets the basic guidelines, while social responsibility enables their practical application in business activities. In the long term, their interaction contributes to the sustainable development of the company and the improvement of society's quality of life. [4].

## PROBLEMS AND CHALLENGES

The implementation and realization of corporate social responsibility principles face a number of problems and challenges that can hinder companies from effectively fulfilling these commitments. Below are the key problems and challenges businesses face on their path to social responsibility:

### *1. Balancing Profit and Social Responsibility*

One of the main problems is finding a balance between the pursuit of profit and adhering to social and environmental obligations. Companies often face difficulties in effectively integrating these principles without compromising financial performance. [5].

Challenge: Implementing environmentally friendly technologies or social programs requires significant investments, which may reduce short-term profits.

Solution: Long-term investments in sustainable development and reducing the environmental footprint can lead to economic benefits in the future.

### *2. Lack of Universal Standards and Regulations*

Corporate social responsibility (CSR) does not yet have unified global standards and norms, which creates confusion and makes it difficult to assess the effectiveness of companies' efforts. CSR programs can vary greatly depending on the region, country, and even the business itself [6].

Challenge: Problems arise when trying to measure a company's real contribution to society and the environment.

Solution: The development of international standards and unification of approaches will help create common guidelines and increase transparency.

### *3. Undervaluing Long-Term Benefits*

Some companies may underestimate the long-term advantages of social initiatives, such as improving reputation, customer loyalty, and reducing risks associated with environmental or social issues. [7].

Challenge: Businesses focused on short-term profits may not recognize the value of long-term investments in social responsibility.

Solution: Engaging leadership and shareholders to understand the importance of a strategic approach to social responsibility.

#### *4. Lack of Proper Monitoring and Reporting*

Many companies implement social initiatives on paper without ensuring adequate monitoring and reporting. This leads to weak program effectiveness and low trust from society and customers.

Challenge: Issues with the authenticity and transparency of CSR efforts can lead to accusations of "pranking" or "greenwashing."

Solution: Creating effective mechanisms for control, reporting, and independent verification to improve transparency.

#### *5. Problems with Integration into Corporate Culture*

Integrating social responsibility principles into corporate culture can be a challenging task, especially if the company previously lacked corresponding practices.

Challenge: Insufficient involvement of employees and leadership in social responsibility can reduce the effectiveness of these programs.

Solution: Training and motivating employees, as well as creating sustainable and clear internal processes for implementing social responsibility.

#### *6. Economic and Political Risks*

Especially in countries with unstable economic or political situations, social responsibility may be subject to changes due to external factors such as changes in tax policies, political shifts, or economic crises.

Challenge: The inability to effectively plan and implement social programs in times of uncertainty.

Solution: Developing flexible strategies that allow adaptation to changing economic and political conditions.

#### *7. Conflicts of Interest with Stakeholders*

Sometimes, business interests may conflict with the expectations of other stakeholders—customers, shareholders, government, and society.

Challenge: Differences in priorities can lead to difficulties in making decisions that benefit all parties.

Solution: Establishing open dialogue and collaboration with stakeholders to find compromises and make balanced decisions.

Corporate social responsibility, despite its importance, faces numerous problems and challenges. However, considering global changes and the growing demands from society, companies that successfully overcome these difficulties can gain significant advantages in terms of customer loyalty, improved reputation, and long-term sustainability.

## **CONCLUSION**

Corporate social responsibility (CSR) and ethics have become integral parts of a successful strategy for companies aiming for long-term and sustainable development. In the context of globalization and growing social awareness, organizations must not only focus on profit but also actively contribute to the well-being of society and the environment. Ethics establish foundational

principles such as honesty, fairness, and transparency, while social responsibility serves as a practical tool for their implementation.

Implementing and adhering to CSR principles helps companies strengthen their reputation, increase consumer loyalty, and minimize risks related to negative environmental and social impacts. However, there are certain challenges on the path to realizing these principles, such as finding a balance between profit and responsibility, the lack of unified standards, and difficulties in integrating social responsibility into corporate culture.

Nevertheless, companies that overcome these challenges gain significant competitive advantages. Responsibility toward society and nature has become a crucial factor determining business success in the modern world. Ultimately, ethics and corporate social responsibility play a key role in forming a sustainable and just society, where the interests of business and society are harmoniously aligned.

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# COP 29 – YEAR OF SOLIDARITY FOR A GREEN WORLD IN AZERBAIJAN ACTIVITIES OF ORGANIZATIONS

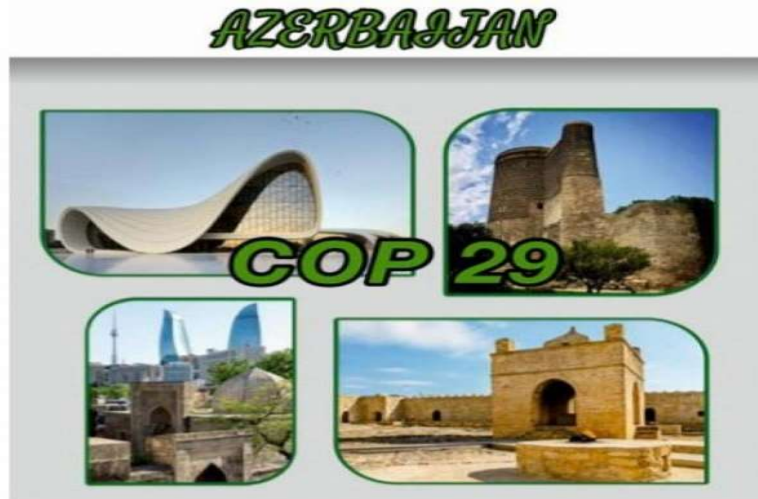
COP 29 –AZƏRBAYCANDA YAŞIL DÜNYA NAMİNƏ HƏMRƏYLİK İLİ TƏŞKİLATLARIN FƏALİYYƏTİ

**Çobanova Nərgiz Məhəmməd qızı**

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Abstract. The decision to hold COP29 in Baku also means global support for Azerbaijan's green energy policy. Accordingly, by the Decree of the President of the Republic of Azerbaijan Ilham Aliyev, 2024 was declared the "Year of Solidarity for the Green World" in Azerbaijan. Azerbaijan, an oil and gas country, has identified the creation of green energy types and the transportation of green energy to world markets as a new priority direction of energy policy. The export of electricity produced on the basis of renewable and green energy has led to the beginning of a new era in Azerbaijan's energy strategy. Azerbaijan's renewable energy potential is very high. By 2030, the share of renewable energy in the installed capacity of electricity is expected to reach 30 percent in Azerbaijan.

Keywords: Azerbaijan, COP-29, green energy, world, politics



Hər il fərqli ölkənin ev sahibliyi etdiyi BMT-nin İqlim Dəyişikliyi üzrə Çərçivə Konvensiyasının Tərəflər Konfransının ilk tədbiri 1995-ci ilin martında Berlində, COP28 isə 2023-cü ildə Birləşmiş Ərəb Əmirliklərinin Dubay şəhərində keçirilib. Tərəflər Konfransının 29-cu sessiyası, yəni COP29 isə bu ilin noyabr ayında Azərbaycanda, Bakı şəhərində keçirildi. Bununla bağlı qərar COP28-in ötən il dekabrın 11-də Dubayda keçirilmiş plenar iclasında qəbul olunub. Bu, dünyanın bir nömrəli beynəlxalq tədbiridir, beynəlxalq konfransdır. Bakı iki həftə ərzində dünyanın mərkəzi oldu və şəhər təqribən 70-80 min xarici qonağı qarşıladı. Konfransın ən mühüm müsbət nəticələrindən biri kimi ölkədə turizm xidmətlərinin keyfiyyətinin daha da yüksəldilməsi göstərilir. Təbii ki, turizm və logistika sahəsində yüzlərlə yeni peşəkar mütəxəssis hazırlanacaq, bir çox problemlərin həlli ilə

bağlı turizm və dövlət xidmətlərinin keyfiyyəti dəyişəcək. Regional turizm sahəsində də keyfiyyət dəyişikliyi gözlənilir, yeni marşrutlar və səhər turları təşkil olunacaq.

COP29-un Azərbaycanda keçirilməsi, ilk növbədə, BMT tərəfindən Azərbaycanın iqlim məsələsində üzərinə götürdüyü öhdəlikləri yerinə yetirməsinin etirafıdır. Bundan əlavə, COP29-un Azərbaycanda keçirilməsi ölkədə siyasi və iqtisadi sabitliyin BMT səviyyəsində tanınmasından xəbər verir.

Azərbaycan çoxsaylı siyasi, iqtisadi və regional inkişaf layihələrində iştirak edib və etməkdədir. Məsələn, ölkəmiz artıq ardıcıl dördüncü ildir ki, BMT-dən sonra ikinci ən böyük beynəlxalq təşkilata – Qoşulmama Hərəkatına sədrlik edir. Azərbaycan Avropa İttifaqının doqquz üzvü ilə strateji tərəfdaşlıq bəyannaməsi imzalayıb. Bu, dünya siyasətində unikal nümunədir, çünki çox az ölkə eyni vaxtda İslam Əməkdaşlıq Təşkilatı və Avropa Şurasının üzvüdür.

COP29-un Bakıda keçirilməsi qərarı, həm də Azərbaycanın yaşıl enerji siyasətinə global dəstəyi ifadə edir. Buna uyğun olaraq, Azərbaycan Respublikasının Prezidenti İlham Əliyevin Sərəncamı ilə 2024-cü il Azərbaycanda “Yaşıl dünya naminə həmrəylik ili” elan edilib. Neft-qaz ölkəsi olan Azərbaycan yaşıl enerji növlərinin yaradılmasını və yaşıl enerjinin dünya bazarlarına nəqlini hazırda enerji siyasətinin yeni prioritet istiqaməti kimi müəyyən edib. Bərpaolunan və yaşıl enerji əsasında istehsal edilən elektrikin ixracı Azərbaycanın enerji strategiyasında yeni eranın başlanmasına səbəb olub. Azərbaycanın bərpaolunan enerji potensialı çox yüksəkdir. 2030-cu ilədək elektrik enerjisinin qoyuluş gücündə bərpaolunan enerjinin payının Azərbaycanda 30 faizə çatdırılması gözlənilir.

2020-ci ildə 44 günlük müharibədən dərhal sonra Prezident İlham Əliyev Qarabağı və Şərqi Zəngəzuru, Naxçıvanı “yaşıl enerji bölgəsi” adlandırıb və bu istiqamətdə genişmiqyaslı işlərə başlanılıb. Azərbaycanın bütün bölgələrində, eləcə də işğaldan azad edilmiş Kəlbəcər və Ağdərə rayonlarında geotermal və Günəş enerjisi ehtiyatları, Laçın, Qubadlı və Zəngilan rayonlarında hidroenerji mənbələri, Şuşa, Xocavənd və Cəbrayıl rayonlarında külək enerjisi, Tərtər, Ağdam, Xocalı rayonlarında bioenerji ehtiyatlarının səmərəli istifadə edilməsi nəticəsində ölkəmizin ümumilikdə “Yaşıl enerji” istehsalçısına və istehlakçısına çevrilə bilər. Artıq Qarabağda və Şərqi Zəngəzurda hidroenerji potensialından fəal şəkildə istifadə edilir. Yaxın illərdə burada hidroelektrik stansiyaların gücü 500 meqavat olacaq ki, bu da yaşıl enerjiyə keçid prosesinə böyük töhfədir.

COP29-un Azərbaycanda keçirilməsi ilə bağlı qərarın qəbul edilməsi bir daha təsdiq edir ki, ölkəmizin bu sahədəki fəaliyyəti BMT daxil olmaqla, beynəlxalq və global təşkilatlar tərəfindən yüksək qiymətləndirilib. Məhz bu səbəbdən də Azərbaycanın namizədliyi dəstək olunub və təsdiqlənib. Azərbaycan regionda yaşıl enerjinin inkişafına ən çox investisiya edən ölkələrdən biridir. Məhz bu baxımdan COP-29-un Azərbaycanda yüksək səviyyədə təşkili nəzərəçarpandır. COP29 bir sıra istiqamətlərdə - Azərbaycanın iqtisadiyyatı, eyni zamanda Azərbaycanın yaşıl enerji sahəsində, həyata keçirdiyi fəaliyyətlərin təqdimatı baxımından da çox vacibdir. Eyni zamanda QHT təşkilatlarının, Milli təşkilatların həyata keçirdiyi fəaliyyətlərin təqdimatı da çox vacibdir. QHT və dövlət qurumlarının həyata keçirdiyi ekoloji layihələr, ölkəmizdəki mina problemi və ekoloji nəticələrinə dair bilgilər verildi. Bu baxımdan demək olar ki, “Ümid” Sosial İnkişafa Dəstək İctimai Birliyi COP29-da suvarma və içməli su təchizatına dair yan tədbir keçirib. 2024-cü il noyabrın 12-də COP29 çərçivəsində Yaşıl Zonada yerləşən Milli QHT Forumu Pavilyonunda “Ümid” Sosial İnkişafa Dəstək İctimai Birliyi “Suvarma və içməli su təchizatı üçün icma səviyyəli həll variantları” mövzusunda panel müzakirəsi təşkil edib.

Tədbirdə QHT nümayəndələri, ekspertlər və icma üzvləri iştirak edib.

Panel müzakirəsi zamanı su qıtlığı ilə bağlı problemlərin həlli və qarşısının alınması yolları müzakirə edilib. İştirakçılar su resurslarının qənaətli və təhlükəsiz istifadəsi, su mənbələrinin dayanıqlılığı üçün tətbiq edilən strategiyalar barədə fikirlər bildiriblər.

Tədbirdə iştirak etdikdən sonra Yaşıl Zonada təşkil olunmuş bütün Pavilyonları gəzdik. QHT və dövlət qurumlarının həyata keçirdiyi ekoloji layihələr, ölkəmizdəki ekoloji problemlərə dair bilgiler verirdi. Azərbaycan COP 29-un təşkilinin mükəmməliyinə valeh olmamaq mümkün deyil. Azərbaycan COP29 beynəlxalq konfransına yüksək səviyyədə ev sahibliyi etməyə nail olduğunun bir daha şahidi olduq.

# THE USE OF GREEN ENERGY IN INDUSTRIAL ENTERPRISES: BENEFITS, CHALLENGES, AND PERSPECTIVES

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*Abstract:* The use of green energy in industrial enterprises plays a significant role in enhancing environmental protection and ensuring sustainable development. This paper discusses the benefits and applications of green energy for the industrial sector, as well as the challenges faced and future perspectives. The main sources of green energy include solar, wind, biomass, hydroelectric, and geothermal energy. The specific applications and advantages of each energy source are examined. The use of green energy positively impacts the reduction of carbon emissions, the increase of energy independence, and the improvement of economic efficiency. However, challenges such as high initial investment costs, technical difficulties, and geographical limitations remain. Ultimately, technological advancements, governmental support, and international cooperation are crucial for the widespread implementation of green energy in the industrial sector.

*Keywords:* Green energy, Industrial enterprises, Renewable energy, Carbon emissions, Energy independence, Economic efficiency, Solar energy, Wind energy, Biomass, Hydroelectric energy, Geothermal energy, Environmental sustainability, Technological development, Government support, Industrial sector

In recent years, global climate change and environmental protection issues have gained significant importance across various sectors of the global economy. The industrial sector, particularly due to its high energy consumption and notable environmental impacts, is a major area of concern. Therefore, the application of green energy in industrial enterprises presents an important approach for improving ecological sustainability and economic efficiency. Green energy, derived from natural and renewable energy sources, enables the implementation of sustainable and environmentally friendly industrial production while also helping to reduce carbon emissions.

Industrial enterprises are major participants in global energy consumption and carbon emissions. The use of conventional energy sources in these enterprises contributes to environmental pollution and global warming. In contrast, the use of green energy sources significantly reduces these impacts and allows for the implementation of more sustainable production methods. The application of green energy in industrial enterprises not only increases the flexibility of energy production but also provides economic benefits. For instance, electricity generated from renewable energy sources can be provided at lower costs in the long term after the initial investment is recouped. One significant advantage of green energy use in industrial enterprises is the enhancement of energy independence. The use of local energy sources reduces reliance on foreign energy resources and ensures national energy security. Furthermore, green energy applications can be implemented under more favorable conditions through various financial incentives and subsidies provided by the government.

The main green energy sources used in industrial enterprises include solar, wind, biomass, hydroelectric, and geothermal energy. Each energy source has its unique application areas and advantages.

**Solar Energy:** Solar energy allows for the generation of electricity from sunlight using photovoltaic panels. This is particularly beneficial for industrial enterprises with large rooftop areas. Solar energy provides stable energy throughout the year, generating long-term financial savings for enterprises.

**Wind Energy:** Wind energy is converted into electricity through wind turbines. It is most effective in areas with consistent winds. This energy type provides industrial enterprises with continuous, clean energy while minimizing environmental impact.

**Biomass Energy:** Biomass energy is derived from the combustion of organic materials. Agricultural waste or wood residues can be used as biomass sources. This energy type is particularly useful in industries with high waste disposal, improving energy supply.

**Hydroelectric Energy:** Hydroelectric energy generates electricity through the power of water. In regions with abundant water resources, hydroelectric plants can supply industrial enterprises with clean and sustainable energy. This provides a solution to the high energy demands of industrial regions.

**Geothermal Energy:** Geothermal energy is derived from heat within the Earth's crust. This energy type is particularly suitable for industrial enterprises with high heating requirements, ensuring long-term sustainability.

The widespread adoption of green energy in the industrial sector faces several challenges. First and foremost, the implementation of green energy technologies requires high initial investments. For example, the installation of systems such as solar panels and wind turbines requires substantial capital. However, in the long run, these investments pay off, providing lower energy costs. Moreover, there are technical challenges in the application of green energy systems. A significant portion of green energy sources are intermittent, such as solar energy, which is only available during daylight hours, and wind energy, which is only available during windy periods. Therefore, the development of energy storage technologies is essential. The efficiency of green energy sources also depends on geographic and climatic conditions. For example, solar energy is most effective in sunny regions, while wind energy may not be suitable for areas where wind speeds are low.

Technological advancements, government support, and international cooperation are vital for the broader application of green energy technologies in industrial enterprises. Developments in technology continue to focus on making green energy systems more efficient and cost-effective. The development of energy storage systems and more effective energy production methods will increase the efficiency of intermittent energy sources and accelerate the transition of the industrial sector to green energy.

Government policies and financial incentives that promote the production of green energy will lead industrial enterprises to adopt renewable energy sources more extensively. Additionally, in the fight against global climate change and the reduction of carbon emissions, increasing the use of green energy will remain a significant priority.

**Conclusion:** The use of green energy in industrial enterprises contributes significantly to environmental protection and the achievement of sustainable economic development. However, challenges such as high initial investment costs and technical limitations still pose major barriers. Nevertheless, with the continued development of green energy technologies and government support, the widespread adoption of these energy sources in the industrial sector is expected, playing an essential role in the protection of the global environment.

# Post-Pandemic Restructuring of Air Cargo

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**Annotation:** This article analyzes the impact of the COVID-19 pandemic on the air cargo sector and how the industry was restructured in the post-pandemic period. At the beginning of the pandemic, air transport was severely halted, and due to the closure of international borders, disruptions in logistics networks, and interruptions in supply chains, cargo transportation faced significant challenges. This paper examines the consequences of the crisis caused by the pandemic, the emerging new demands in air cargo, and the adaptation and restructuring processes within the sector.

It also discusses how airlines adapted to the new conditions, the implementation of innovative technologies and digital solutions, and how security and risk management measures were updated. At the same time, the increasing demand for urgent and flexible transport services, the rise of e-commerce, and the impact of these changes on company operations are explored. The innovations brought about by the crisis are also linked to the development of ecological and socially responsible approaches.

The article presents forecasts on the long-term prospects of the air cargo sector post-pandemic and discusses the key expected changes in technology, operations, and marketing within the industry. This work serves as an important resource for researchers, logistics professionals, and anyone involved in the field.

**Keywords:** Post-pandemic, air cargo, adaptation, crisis, logistics, risk management, technological advancements, digital solutions, e-commerce, transport services, supply chains, international trade, agile operations, restructuring, innovation

Post-pandemic, following the economic and social crisis caused by the COVID-19 pandemic, various sectors, including air cargo, faced adaptation and restructuring processes. This period led to challenges in the gradual recovery of economies and adjustment to new conditions. [1]

Air cargo experienced a significant decline during the pandemic, and alongside the recovery of global trade chains, it also required strategic approaches to meet new transportation needs for the future. [2]

Adaptation refers to the process by which air cargo companies responded to the challenges posed by the pandemic by adjusting their operations, technologies, and services to the new conditions. This also involved implementing more flexible and efficient operations. [3]

The crisis caused by the COVID-19 pandemic, global recession, and border-crossing interruptions had a major impact on air cargo. This crisis led to significant innovations and changes across various areas of the sector. [4]

Logistics is a critical part of air cargo networks. During the pandemic, challenges in logistics operations accelerated the application of new solutions and technologies. [5]

Risk management became essential for managing the risks faced by the air cargo sector during the pandemic. This involved updating insurance policies, security protocols, and operational plans. [6]

Technological advancements led to the introduction of digital solutions, automation, and artificial intelligence, enabling more efficient and flexible operations in air cargo during the

pandemic. Digital solutions facilitated better data management and accelerated operations, improving service quality.[7]

International trade saw a decline during the crisis, and the role and importance of air cargo in global supply chains demanded a restructuring of the sector on a global scale. Agile operations were implemented in response to the uncertainties caused by the pandemic, making air cargo operations more flexible and resilient.[8]

Restructuring in the post-pandemic era required the air cargo sector to adapt to new norms and restore its operations. This also demanded the optimization of operations and the creation of new business models. Innovation accelerated during the pandemic, driving the implementation of new solutions in air cargo. Technological advancements spurred greater operational efficiency and the creation of new business opportunities.[9]

A table presenting key economic indicators related to the restructuring of air cargo after the pandemic, including data up to 2024, is provided below.

Table

"Pandemic Aftermath Economic Indicators of Air Cargo (2020–2024)"

Years	Global air cargo volume (ton-km)	Growth rate of total cargo transportation (%)	Adoption of new technologies (%)	Revenue of air cargo sector (Billion USD)	Innovative solutions in logistics and transportation (Investments, Million USD)	Total Volume of International Cargo (Million Tons)
2020	4,100,000,000 ton-km	-7.6%	15%	94.6	1,500	90,000
2021	4,300,000,000 ton-km	3.5%	20%	98.1	2,000	92,000
2022	4,700,000,000 ton-km	9.3%	25%	105.4	3,500	95,000
2023	5,000,000,000 ton-km	6.4%	30%	110.2	4,500	98,000
2024	5,200,000,000 ton-km	4.0%	35%	115.0	5,000	100,000

**Conclusion:**The air cargo sector has entered a significant recovery phase after the pandemic. Although the sector faced a decline due to the crisis in 2020, growth began to recover in 2021, and by 2024, it is expected to show positive development trends.

From 2020 to 2024, the total volume of air cargo has increased. In 2024, it is anticipated that the volume of air cargo will reach 5.2 billion ton-kilometers, representing a significant increase compared to 2020. Post-pandemic, the sector has gradually returned to its previous levels, continuing to grow alongside the recovery of global trade.

Technology has brought significant changes to the sector. In 2024, the application of new technologies such as automation, artificial intelligence, IoT, blockchain, and drones is expected to reach 35%. This will ensure faster and more efficient operations in air cargo. Increased investments have accelerated digital transformation within the sector, improving customer services and reducing operational costs. During the pandemic, the integration of passenger and cargo transportation was strengthened, helping companies establish more agile and profitable business models. By 2024, this integration will expand further, creating more synergies within the sector.

International trade has been restored, and as a result, the volume of international cargo shipments is expected to reach 100 million tons by 2024. This indicates strong demand for the strengthening of global supply chains and increased cargo transportation. By 2024, the air cargo sector's revenue is expected to reach approximately \$115 billion, signaling a gradual recovery from the effects of the pandemic and a growing revenue flow within the sector.

Air cargo companies need to invest more in technological solutions. The application of technologies such as automation, digital platforms, drones, and blockchain will lead to reduced operational costs and enhanced customer services. New technologies and operational procedures that allow for more work with fewer resources should be implemented for operational optimization. The pandemic demonstrated that risk management and insurance issues play a significant role in the sector.

Closer collaboration between airlines and trade organizations is needed for the recovery of international cargo shipments. This will help both increase trade flows and improve operational efficiency. More sensitive customer service and real-time tracking systems should be implemented to enhance customer satisfaction.

The post-pandemic air cargo sector has undergone significant development and adaptation, moving positively towards 2024. The future of the sector looks brighter with the application of technologies, agile operations, and strengthened risk management. These recommendations will enable the sector to take necessary steps to become more efficient, resilient, and competitive.

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# The current state of small and medium-sized businesses in the Republic of Kazakhstan

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**Annotation.** The article reflects the key points in the development of small and medium-sized businesses in the Republic of Kazakhstan. The analysis of the share of the gross value added of small and medium-sized businesses in the gross domestic product, the number of active SMEs has been carried out. The structure of employment in SMEs is distinguished from the total employment of the population in the Republic of Kazakhstan. The analysis of production output by SMEs per capita and tax revenues to the budget from small and medium-sized businesses is carried out. The analysis of statistical data on labor productivity and investment in fixed assets was carried out, as well as international rankings on entrepreneurship were considered. The role of small and medium-sized businesses in the national economy and the problems it faces are identified.

Key words: small and medium business, employment, taxes, labor productivity, analysis.

**Introduction.** Small and medium - sized enterprises provide the foundation for a modern-style market economy by forming the structural foundations of the economy, the competitive environment, generating and implementing innovations, meeting the market's needs for goods and services, ensuring employment and increasing tax revenues. In the priority areas of development of society, which the first president of the country N. Nazarbayev put forward in his addresses to the people of Kazakhstan, the main place is occupied by economic growth based on an open market economy and real competition with a high level of foreign investment and domestic savings [6]. At the new stage of development, Kazakhstan solves a wide range of tasks related to increasing the competitiveness of the national economy. This is primarily a restructuring of the economy, the development of infrastructure and market institutions, as well as overcoming the shortcomings inherited from the previous period, i.e., imperfection of the sectoral and technological structure; weak internal integration, insufficient viability of productive forces. It's all small and participated in the development of medium-sized businesses. The socio-economic role of this sector is of great importance not only in countries with an established market economy, but also in countries with a relatively recent market economy. N. Nazarbayev: «The basis of a strong economy is, first of all, strong small and medium - sized businesses, the strategic goal is to bring its share in the country's GDP to 50% by 2050. In the future, small and medium-sized businesses should become the main employer in the country» [2]. The purpose of the scientific article is to analyze the current state of small and medium-sized businesses. In the conducted study, the following complex of theoretical and Empirical Methods was used: analysis of scientific literature on the research problem, compilation and generalization of the results obtained.

**Literature review.** In developed countries, a large role is assigned to small and medium-sized businesses. Small and medium-sized enterprises are a source of employment and sustainability. Small and medium the activities of influencers their development and growth is an urgent source for many foreign and local scientists, since the formation of the middle class and the creation of jobs is one of the most important priorities of countries. As one of the most important studies in the study of small and medium-sized businesses, the following foreign scientists can be noted: Hosking a [9]., Pinshot G [12]., Williams G [1], Minna Saunila [13], Khizrich R [8]. Many modern works on small and medium-sized businesses are descriptive: they reflect the role of small and medium-sized businesses in the country and the factors of its development, the formulation of problems, the establishment of the need for state support and the description of its mechanism. However, the assessment of the impact of small and medium-sized businesses on economic growth, both in Kazakhstan and abroad, shows that economic structures have different types of activities much has not been done in the field of interaction with the scale, identification of potential areas of application of entrepreneurial capital and barriers to self-development, testing the hypothesis of the effectiveness of small and medium-sized firms in certain industry markets, methodology for developing a mechanism for legislative, consulting and educational support of small and medium-sized businesses at the regional level.

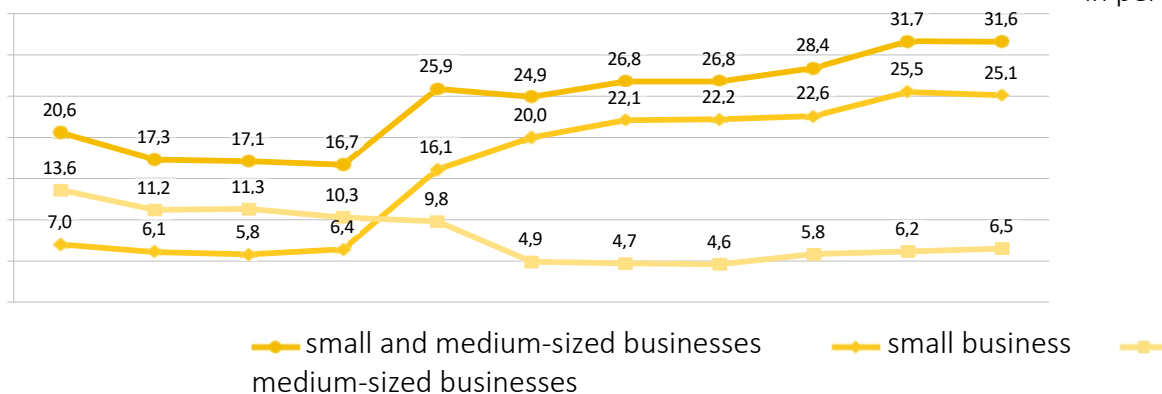
**The main part.** Citizens of the country today have a real opportunity to engage in entrepreneurial activity, and the state, in turn, encourages citizens with various support measures. Despite all this, small and medium-sized businesses face a number of problems in their development: the lack of sufficient financial resources, the low qualification and competitiveness of products produced by small and medium-sized businesses, the complex procedure for small and medium-sized businesses to enter World Markets, the intensification of the problem of providing qualified specialists and employees, insufficient financing of science.

At the present stage of economic development in the Republic of Kazakhstan, the share of small and medium-sized businesses in the gross domestic product according to 2020 data amounted to 31.6%, which increased by 11.0% compared to 2010. The share of small and medium-sized businesses in the gross domestic product of developed countries is 50-60%. That is, in comparison with Kazakhstan, about 2 times more. However, the share of small businesses in the gross domestic product is growing every year. Compared to 2010, this figure increased by 18.1%. As for medium-sized businesses, the share of this indicator, on the contrary, decreased significantly from 2010 to 2017. Since 2017, the share of medium-sized businesses has been growing gradually. According to the data for 2020, it was 6.5%. [7] (Figure 1).

Figure 1

### The share of small and medium-sized businesses in the gross domestic product

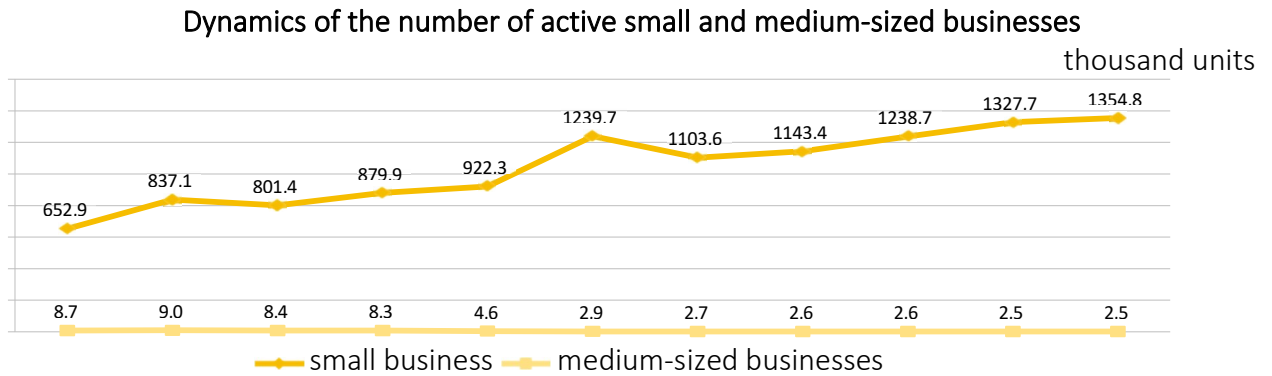
in percent



Note: calculated on the basis of data from the Bureau of national statistics of the agency of the Republic of Kazakhstan for Strategic Planning and reforms [7].

According to the Bureau of national statistics, since 2010, the number of small businesses has increased from 652.9 thousand units to 1354.8 thousand units, or 2 times. In the studied period (2010-2020. the number of medium-sized businesses, on the contrary, decreased by 6.2 thousand units. Growth in the total number of small and medium-sized businesses (2010-2020).) due to the increase in entrepreneurship in the areas of Education (+10 times), financial and insurance activities (+5 times), Industry (+3 times) and others. (Figure 2).

Figure 2

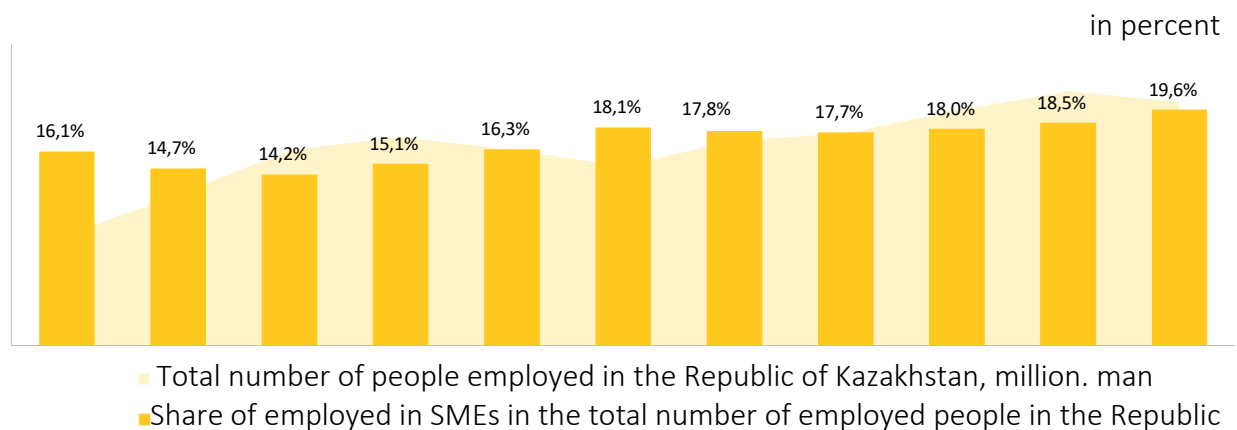


Note: calculated on the basis of data from the Bureau of national statistics of the agency of the Republic of Kazakhstan for Strategic Planning and reforms [7].

The next indicator characterizes the "size" of the segment of medium-sized businesses in small and medium-sized businesses. In small and medium-sized enterprises, without providing a significant mass of human capital, its share in the economy it is very difficult to increase. In general, since 2010, the share of employed in small and medium-sized businesses in the number of employed people has been growing. Share of employed in small and medium-sized businesses in the number of people employed in 2020. It was equal to 19.6% and increased by 3.5% compared to 2010.

Figure 3

**The number of employed in the Republic of Kazakhstan and the share of employed in small and medium-sized businesses**



Note: calculated on the basis of data from the Bureau of national statistics of the agency of the Republic of Kazakhstan for Strategic Planning and reforms [7].

As for tax payments, over the past 5 years, the share of small and medium-sized businesses in tax revenues from enterprises to the budget is on average 23%. The amount of tax from small businesses since 2016 amounted to 317.5 billion rubles. increased by tenge or 40.0%. As for medium-sized businesses, tax revenues to the budget in 2016 amounted to 832.3 billion rubles.

there was a tenge. In comparison with 2020, this figure is 451.6 billion rubles. increased by KZT or 54.3%. (Table 1).

Table 1

**Tax revenues to the budget from small and medium-sized enterprises**

	2016	2017	2018	2019	2020
Small enterprises	794,5	856,0	935,0	1 057,6	1 112,0
Medium-sized enterprises	832,3	916,8	1 042,6	1 207,1	1 283,9
Share of SMEs in the amount of gross income tax, %	25,4	22,2	20,3	21,3	27,8

billion  
tenge

*Note: Compiled by the authors on the basis of data from the state Revenue Committee of the Ministry of Finance of the Republic of Kazakhstan [5].*

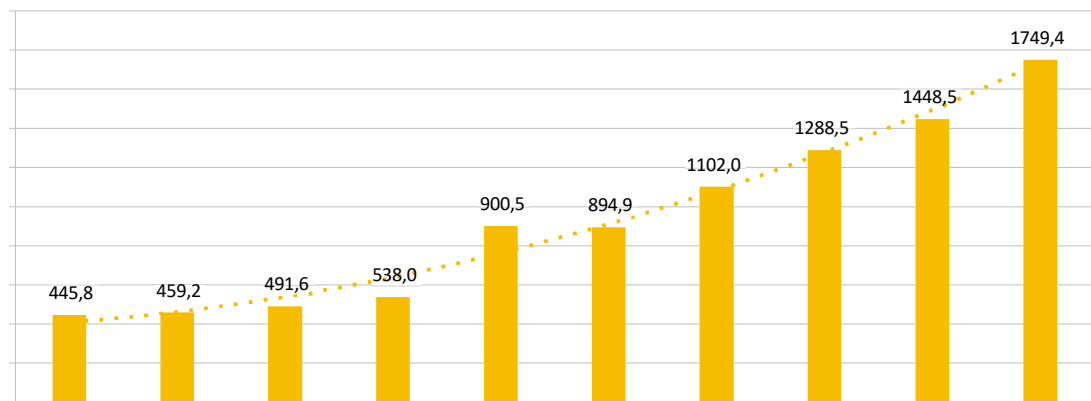
Manufactured products – the cost of all issued products and services rendered, expressed at the price of the manufacturer. Per capita output is an indicator of the level of economic development of the country and the average standard of living of the population. It is calculated as the cost of all goods and services produced in the country during the year, divided by the total population.

During the studied period, the output of small and medium-sized enterprises per capita is growing rapidly. According to the National Bureau of Statistics, in 2010 this figure was equal to 445.8 thousand tenge. In comparison with 2019, the output of small and medium-sized enterprises per capita increased by 1303.6 thousand tenge or 3.9 times. The dynamics of the output of small and medium-sized enterprises per capita is shown in Figure 4.

Figure 4.

**Production of small and Medium-Sized Enterprises per capita**

thousand tenge



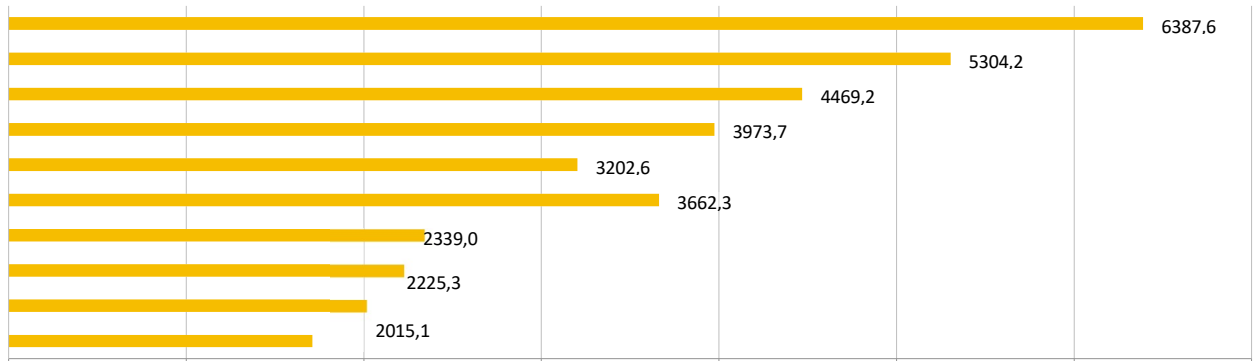
*Note: calculated on the basis of data from the Bureau of national statistics of the agency of the Republic of Kazakhstan for Strategic Planning and reforms [7].*

For a qualitative assessment of changes in the segment of a small and medium-sized enterprise, the indicator of how much value added is produced by one employee is very important. To assess it, the labor productivity of a small and medium-sized enterprise is used. In 2010, there was a sharp increase in labor productivity from 1709.9 thousand tenge to 366.2.3 thousand tenge in 2014. The following year, productivity decreased by 12.6% or 459.7 thousand tenge. Labor productivity of small and medium-sized businesses in 2020 amounted to 6387.6 thousand tenge (an increase of 4677.7 thousand tenge or 3.7 times compared to 2010).

Figure 5.

**Labor productivity of small and Medium-Sized Enterprises**

thousand tenge / person



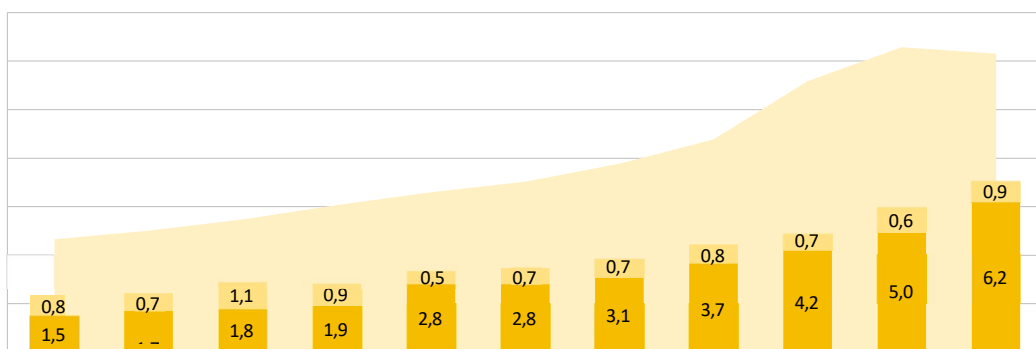
Note: calculated on the basis of data from the Bureau of national statistics of the agency of the Republic of Kazakhstan for Strategic Planning and reforms [7].

The next indicator that evaluates small and medium-sized businesses will be investment. Investments in fixed assets – investment by an investor in order to obtain an economic, social and environmental impact, aimed at new construction, expansion, as well as reconstruction and modernization of facilities, the purchase of machinery, equipment, vehicles, the formation of the main herd, perennial plantings, etc., which leads to an increase in the initial cost of the facility. Invested in fixed assets in 2010 investments were disbursed by small businesses in the amount of 1 1.5 trillion. 0.8 trillion tenge and medium-sized businesses. there was a tenge. The disbursement of investments in fixed assets by small enterprises increased annually by 6.2 trn in 2020. in 2010, this indicator was 0.8 trillion tenge, and in 2020-0.9 trillion tenge. only 0.1 trillion tenge. small and Medium-Sized Enterprises the share of investments in fixed assets mastered by SMEs in total mastered investments is studied.

Figure 6.

**Development of investments in fixed assets**

trillion. Tenge



■ development of investments in fixed assets ■ small business ■ medium-sized businesses

Note: calculated on the basis of data from the Bureau of national statistics of the agency of the Republic of Kazakhstan for Strategic Planning and reforms [7].

In the "Doing Business 2020" rating, which reflects the situation in 2019, Kazakhstan rose by 25 positions compared to the "Doing Business 2014" rating - from 50 to 25. Kazakhstan is ahead of OECD countries such as France (32nd place), Turkey (33rd place), the Netherlands (42nd place), Belgium (46th place), Italy (58th place). Among the EAEU countries, Kazakhstan is ahead of the

Russian Federation (28th place), Belarus (49th place), Armenia (47th place) and Kyrgyzstan (80th place).

At the same time, the Doing Business rating assesses the entrepreneurial climate in terms of a favorable legal environment for the protection of business and property rights (legislation related to the regulation of entrepreneurship). However, this cannot give an accurate assessment of the current situation in the business environment.

In recent years, the rating has undergone changes in the calculation methodology, including new ones added qualitative indicators. To provide comparable indicators, indices are recalculated only for the previous year. Despite the fact that it is impossible to compare the indicators in detail, the rating of Kazakhstan has improved significantly over the past 5 years.

Table 2

#### Kazakhstan in the "Doing Business" rating (190 countries)

№		Рейтингтегі орны
1	New Zealand	1
2	US	6
3	Georgia	7
4	Germany	22
5	Kazakhstan	25
6	Russia	28
7	France	32
8	Turkey	33
9	Netherlands	42
10	Belarus	46

*Note: Compiled by the authors based on Doing Business 2020 data [10].*

In 2018-2019, 54 countries took part in the Global Entrepreneurship control project (Kazakhstan is not represented in the 2019-2020 rating). This study helps to identify factors that encourage or limit entrepreneurial activity by measuring the range of different types of entrepreneurial activity and policy recommendations regarding the growth of entrepreneurship at the local, regional and national levels.

In comparison with 2014, Kazakhstan has improved its performance by 2018-2019. Great progress was observed in the indicators "internal market dynamics" and "physical infrastructure", where the indicator increased more than twice.

In general, the average growth in other indicators was about 50%. It is impossible to compare each indicator in the rating of two reports for 2018-2019 and 2014 due to the different number of participants. If 54 countries participated in the 2018-2019 report, then in 2014 73 economies were presented. One of the most competitive indicators is the provision of support measures.

In terms of support measures, in addition to state policy, Kazakhstan has high rates of taxation and ranks 15th, ahead of Germany, Canada, Japan and other countries.

**Conclusion.** In the address, the first president of the country N. A. Nazarbayev noted that the development of small and medium – sized businesses (SMEs) is the main tool for industrial and social modernization of Kazakhstan in the XXI century. The greater the share of SMEs in the economy, the more stable the development of Kazakhstan will be. He also created a small business

he stressed the importance of taking measures to develop specialization. Small and medium-sized businesses should develop around new innovative enterprises [4].

The further development of small and medium - sized businesses, the use of its innovative potential, its enthusiasm, the development of such forms of interaction, joint production, execution of state orders, leasing, Franchising and venture financing should ensure the stable functioning of the economic system of the Republic of Kazakhstan, which is the main pillar of a strong entrepreneurial class.

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# METHODOLOGICAL BASIS FOR STUDYING THE INFLUENCE OF CORPORATE CULTURE ON ORGANIZATIONAL EFFECTIVENESS

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**Abstract.** The article discusses the methodological foundations of the study of how corporate culture affects the effectiveness of an organization. The stages of the formation of corporate culture, important elements of its evolution and methods of assessing the level of culture within the organization are highlighted. During the research, the features of the development of corporate culture at different stages of the organization's life cycle, as well as the role of managers in this process, were discussed. The main methods of creating a corporate culture, including deliberate and spontaneous formation based on the life cycle of the organization, were considered in the study of this topic. The advantages and disadvantages of corporate culture assessment methods, including the Denison questionnaire, OKAY and OCI, are considered. Additionally, the links between corporate culture and the achievement of strategic goals of the organization, employee engagement and the development of strong professional and interpersonal relationships are considered. As a conclusion, it should be noted the importance of corporate culture as a tool for improving the competitiveness and financial stability of an organization.

**Keywords:** corporate culture, organizational effectiveness, company life cycle, measurement methods, organizational culture, employee engagement, company values, corporate culture development, leadership, strategic goals.

**Introduction.** The formation of a corporate culture is a long and complex process that takes place in several stages, and the stages of building a culture, their content and chronology are determined by the development context of each individual company. The company's corporate culture is formed under the influence of key factors and develops throughout the entire period of the organization's operation[1]. Fundamental standards, values, beliefs, ethnic norms, expectations and beliefs are supported by employees and help set the correct guidelines. The way of uniting the entire team, the coordination of the management team and individual structural units allows us to make the work more coordinated. This invariably affects the success of the entire enterprise as a whole, predetermines the economic stability and competitiveness of the organization. The correct formation of an organization's corporate culture is primarily influenced by the following factors:

- business area, individual characteristics of technologies;
- personality of the leader;
- norms and requirements of the external environment;
- stages of company development.

Also, the corporate culture of an organization shapes the attitude of employees towards their professional work activities and towards the enterprise as a whole. Positive functional and interpersonal relationships are created within the company. It is much easier and easier for new employees to go through the onboarding process if they are familiar with the values, perspectives and mission of the organization. The key point in the process of forming a corporate culture should

be a unified and clear vision of its desired image. Vision is what we need to work on, what we need to pay attention to and, finally, what will be the result of our targeted actions.

The principles that a vision successfully formed and accepted by management must have are:

- Commitment is the main element of successful work, indicating the correct development of the established corporate culture. A person begins to identify himself with the organization, strives to work better in order to contribute to the further success and prosperity of the company.

- Integration - assigning corporate goals, uniting company personnel around them. The formation method is branding, corporate standards and own media: magazines, newspapers.

- Involvement - the desire to take certain steps, make efforts to make one's own contribution to the achievement of main goals. Formation methods include training, personnel development, corporate conferences and seminars. An additional incentive for engagement is to encourage initiative and prepare various competitions and programs.

- Loyalty is expressed in the emotional attachment of employees to their organization, a pronounced desire to remain its members. To form it, family programs, holidays, congratulations, social events, benefits, and privileges are developed. Sports, culture, and charity are actively developing[2].

#### **Materials and methods.**

Within the framework of this study, methods such as the observation method were used to change the culture at different stages of the company's life cycle (for example, in the process of adapting new employees to a startup or introducing new attributes at the maturity stage), quantitative methods using OCI, OCAI and Daniel Denison's methodology, which are well combined with the idea of the need for measurements behavioral styles, values, and employee engagement in the organization. These methods make it possible to identify the correspondence of the current corporate culture with officially declared values and identify "gaps" between them. The methodology of K. Cameron and R. Quinn (OCAI) is ideal for studying cultural changes at different stages of a company's development. An assessment of the management style, strategic goals and success criteria can help in determining the areas in which it is necessary to develop a corporate culture at different stages of its formation (formation, growth, maturity, crisis).

#### **Results and discussion.**

Experts identify two methods for developing corporate culture. The first is a description of the principles that have been formed in the company over the years of its life, and to formulate the values on which these principles are based. The second option is that the company was created not so long ago. In this case, it is necessary to formulate the values that bind its employees and display them in the company's internal local document. The HR department under the leadership of the HR Director should be involved in formulating these values. But the initiative, of course, must come from the company's management. It also approves the final list of values and their interpretation. The HR director and line managers then convey the values to employees and explain their essence. This can be done during the adaptation process of newcomers, with the help of mentors, and during staff training. Kuznetsov A.A. highlights another way to form a corporate culture based on the stage of development of the organization[3].

The life cycles that a company goes through and the approach to creating a corporate culture corresponding to each cycle are shown in Figure 4. Based on the analysis of this graph, it is clear: if a company has just been created and is going through the formation stage, a charismatic manager (leader) is needed to set the tone for the formation of a corporate culture. This is the person around whom the staff will unite and from whom they will take an example. This could be the CEO or one of the founders. When a company enters the growth stage, it should collect the rules and traditions that originated in each division, select the best elements from the subcultures

of each department, and begin to form a system of corporate rules. At the maturity (or stability) stage of a company, it is necessary to extend general rules to all divisions of the company. The process goes in reverse: the characteristics of each department must be brought into line with the system of corporate norms. The most crucial moment is the crisis of maturity, after which either new growth or decline (decline) occurs. During this critical period, radical new elements need to be introduced into corporate culture. Corporate culture must have its own attributes: insignia, corporate colors, dress code rules. They will be associated with the organization and symbolize its uniqueness. For example, the national flag in its material embodiment is just a piece of material painted in different colors. But people, knowing what it symbolizes, perceive it precisely as the insignia of the country. Likewise, corporate symbols hide the very meaning that the company gives them. Corporate culture in a company can be formed spontaneously or purposefully. The spontaneous development of corporate culture occurs in this case if the owners and administration of the company, due to various factors, are not aware of the phenomenon of corporate culture or do not pay proper attention to it. Purposeful formation of corporate culture implies the presence of a specific plan and actions for the development of corporate culture in the company. The corporate culture of a company is inert: it changes, but slowly, the material components change more rapidly in the corporate culture than the spiritual ones, since they take time to assimilate. The results of the development of corporate culture will not be immediately noticeable. The main subject of the formation of corporate culture is the management of the organization. Forming a corporate culture from below, as a rule, is not successful. The work of creating a corporate culture can be done on your own or with the invitation of a consultant. Changing a company's culture is a process that requires dedication and at least leadership involvement[4]. Forming a corporate culture is a long and complex process that traditionally includes four stages, which are presented in Figure 1.



*Figure 1-Stages of corporate culture formation*

How to measure the level of culture in a company? There are special analysis methods for this. Any research involves the use of two groups of methods: direct and indirect. What is each of them?

Direct (qualitative)- these are observations, experiments, interviews, testing, focus groups. Indirect (quantitative) are surveys of employees, clients, suppliers, reviews of the organization on websites, etc. The former cannot be measured. The second ones have quantitative indicators. Therefore, both are used in combination.

To study corporate culture at an enterprise, methodologists use more than 20 proprietary methods.

**Cook and Lafferty's Organizational Culture Inventory (OCI)(Figure 2).**

This is a quantitative research method. The questionnaire identifies 12 styles of behavioral culture and measures them in terms of behavior. The assessment will identify the reasons that prevent you from achieving your goals.

After the survey, determine why some groups work better and others worse. The structure of the questionnaire includes 10 items. On a Likert scale from 1 to 6, the degree of agreement with the given positions is assessed from “totally disagree” to “mostly agree.”

Employees answer questions about how they would act under certain conditions, then describe the ideal company they would like to work for[5].

The results are presented in a pie chart, which is divided into 12 sectors: the need for communication, interaction, understanding each other, temper, competition and others.

Disadvantage: the technique is voluminous and requires investment. But it groups data by behavioral values, which indicate satisfaction, motivation, formal and informal relationships. There comes an understanding of what and how to change.

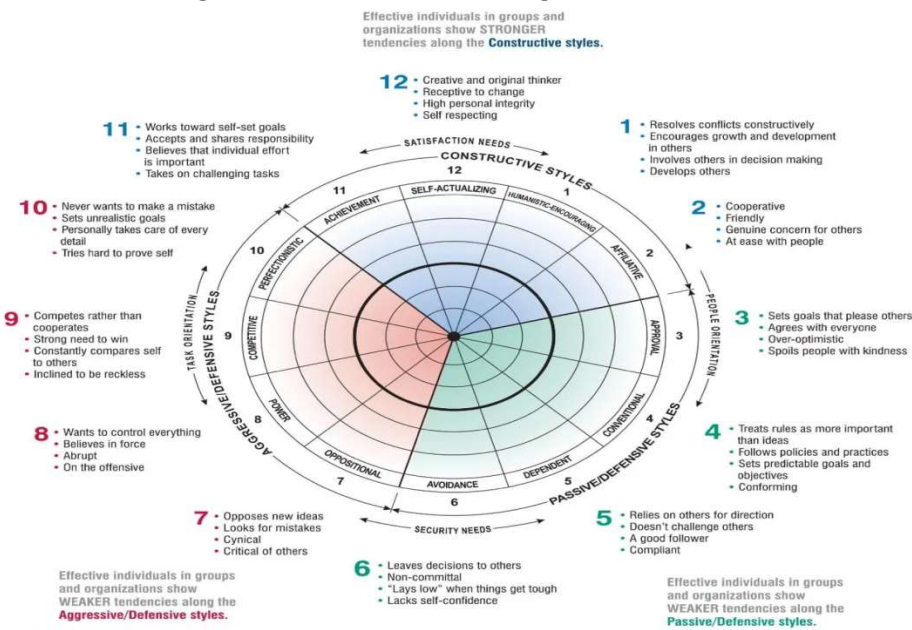


Figure 2-Constructive styles

**Methodology of K. Cameron and R. Quinn (OCAI)**

Quantitative method. The main idea is to evaluate the organization as it is and as it should be. The leader's style, strategic goals and success criteria are assessed. The method combines 4 types of cultures: clan, adhocracy, hierarchical and market. The OCAI is a questionnaire that consists of a group of six-item questions. Participants choose 4 alternative answers and distribute 100 points between them[6].

Goal: to identify the extent to which the culture corresponds to the officially proclaimed one. The survey identifies employee expectations. The survey system is simple, the questions are clear and accessible. Disadvantages: Answer options are limited. The technique is aimed at studying only symptoms, leaving behind the reasons for employee behavior.

**"Corporate Culture Questionnaire" by Daniel R. Denison**

The mission of the organization and the level of involvement are examined. An anonymous survey is being conducted[7]. 60 questions are given with ratings on a scale from 1 to 5. Based on the results, a pie chart is drawn up, where the result is assessed according to the system: external and internal focuses, as well as stability and flexibility.

Advantages of the model: the internal and external environment are taken into account. The results are clear and compact. Disadvantage: complexity of questions and their volume: it takes a lot of time to fill out the questionnaire.

**Organizational Culture Profile (OCP) technique by O'Reilly, Chatman and Caldwell (Figure 3)**

Evaluates the psychological climate in the company. During the survey, 54 cards with characteristics of values are distributed. Participants sort them into 9 categories. in order of importance according to their understanding. It helps identify, measure and manage the culture of team members[8].

The results are analyzed in 7 areas:

- attention to detail: providing the services that clients expect;
- innovative approach: people not only carry out their duties, but improve business processes by making proposals and implementing them;
- aggressive approach in business- focus not on cooperation, but on aggression, that is, any methods are used to survive in competition;
- business focus on results: employees are trained, for example, to sell goods as profitably as possible and their work is evaluated based on the result;
- stability is the basis of work, employees know who is responsible for everything, who to report to and what is expected of them;
- people-oriented: the organization cares about its employees, providing them with the best working conditions and achieving high staff loyalty;
- team-oriented: employees act as team members and support each other, this creates strong relationships within groups.

In reality, one direction is rarely found in a company. For example, sales may have an aggressive culture, while marketing is more team-oriented.



**O'Reilly, Chatman, Caldwell (1991)**

developed a model based on the belief that cultures can be distinguished by values that are reinforced within organizations. Organizational Culture Profile (OCP) to measure employee commitment.



11

Figure 3- O'Reilly, Chatman and Caldwell

### Edgar Schein's research methodology

The qualitative method has a definition: the methodology of “clinical research”. The idea is that employees and customers, at the initiative of the company, learn together about the culture of the organization[9]. Shane identified three levels to study:

First level. Artifacts. These are external signs: dress code, office furniture, equipment, employee behavior, mission and vision of the organization.

Second level. Proclaimed values, norms and rules of behavior: this is a strategy, goals, philosophy. They all give an idea of “how things should be.” But it happens that people understand how it should be, and can even tell you, but in practice they act completely differently.

Third level. Employees' perceived values are the real underlying ideas, beliefs, thoughts, and what employees actually feel and understand.

Shane believes that you need to start studying the level with artifacts. Then the strategy, goals, existing regulations, and beliefs that are actually shared by the team members and its leader are analyzed. Interviews or questionnaires are used.

Comparison of declared and real values will help to identify the real values and rules that team members adhere to. Schein's model is a method that aims to explain the concept of culture and its influence. It is a dynamic model of learning and group development. It is used in organizations all over the world and is considered an important tool for managing mission-driven projects.

Within the framework of this study, these methods were grouped in the form of a table and characterized (Table1).

Table 1. Characteristics of the methods

Method	Type	Description	Advantages	Disadvantages
Cook and Lafferty's Method (OCI)	Quantitative (survey)	Assessment of 12 behavioral culture styles through 10 questions using the Likert scale.	Groups data by behavioral values, helps understand what needs to be changed.	Large volume and cost of implementation, requires time and financial investment.
Cameron and Quinn's Method (OCAI)	Quantitative (survey)	Assessment of the current and desired corporate culture using 4 culture types (clan, adhocracy, hierarchical, market).	Simplicity of the questionnaire, reveals the alignment of company culture with employee expectations.	Limited answer options, addresses only symptoms, not the causes of employee behavior.
Denison's Corporate Culture Survey	Quantitative (survey)	60 questions rated on a scale from 1 to 5, analyzing organizational mission, employee engagement, and cultural foci.	Clear results, identifies internal and external focus, stability, and flexibility.	Complexity and volume of questions, the survey takes a lot of time.

O'Reilly, Chatman, and Caldwell's Method (OCP)	Quantitative (survey)	Assessment of 9 categories of corporate values (e.g., attention to detail, result orientation, innovation).	Identifies key directions of corporate culture, helps manage values across different areas.	Pure categories are rare, mixing different directions in different departments
Edgar Schein's Methodology (Clinical Research)	Qualitative (interviews, surveys)	Studying culture through three levels: artifacts, proclaimed values, and perceived values by employees.	Deep understanding of cultural aspects through different levels, identifying the real culture.	Requires time for deep participant engagement, difficulty interpreting results.
Observations, Interviews, Focus Groups	Qualitative	Direct methods of research including observations, behavior analysis of employees, interviews, and focus groups to study values and practices.	Helps uncover real values and behaviors of employees, deep analysis.	Can be subjective, requires significant time investment.
Employee and Client Surveys	Indirect (quantitative)	Assessment of corporate culture through surveys of employees, clients, suppliers, reviews on websites, etc.	Simple to use, provides quantitative data for analysis.	Responses may be subjective and may not reflect real issues.

This table helps to convey the main ideas of each method.

The methods of analyzing and developing corporate culture are diverse, each of them offers different approaches and ideas. Quantitative methods, such as those developed by Cook and Lafferty (OCI), Cameron and Quinn (OCAI), Denison and O'Reilly, et al., provide measurable data that can identify the alignment of organizational values with employee expectations, identify strengths and weaknesses of culture, and suggest areas for improvement. These methods are effective for large-scale research and offer clear, practical results, although they may have limitations. For example, focus on the symptoms rather than the underlying causes or limited response options.

On the other hand, qualitative methods like those of Edgar Schein, which involve a deeper exploration of cultural artifacts, values, and employee perceptions through interviews and clinical research, can nevertheless offer a deeper understanding of an organization's culture. It takes a lot of time and causes difficulties with interpretation.

The integration of both qualitative and quantitative approaches provides a comprehensive view of an organization's culture, combining direct, measurable data with deeper contextual knowledge. Regardless of the method chosen, an effective assessment of corporate culture requires careful planning, active management involvement and commitment. Long-term development to stimulate positive cultural transformations within the organization.

As part of the study, the following results were identified by using methods to change and evaluate the corporate culture of the company. Google was chosen as the object of the study. At Google, at the formative stage, special attention was paid to the formation of an open, innovative and flexible corporate culture. To adapt new employees, monitoring the interaction of teams in a real environment was used: newcomers received mentors who helped them quickly get used to the informal atmosphere of the company. This approach helped to convey key values such as creative freedom, collaboration, and innovation. At the maturity stage, the observation method was used to analyze the behavior of employees in cross-functional teams. The identified habits and preferences helped Google introduce new corporate attributes, such as flexible schedule rules and optional work from home, which strengthened loyalty and productivity. Google conducted an analysis of employee behavior styles to determine how well they conform to the company's values. The revealed data showed that employees with greater engagement and initiative achieve better results. Based on this data, Google has developed additional mental health and professional development support programs. To assess changes in corporate culture, Google used the OCAI approach, revealing that certain teams tend to have a hierarchical culture that does not correspond to the corporate values of the clan and the adhocracy. This allowed the company to redefine the management style in such teams by introducing more democratic and innovative methods of interaction. At the initial stage, Google managed to create a culture of open communication and innovation, which helped attract talented specialists. During difficult periods (for example, the pressure of antitrust investigations), the company actively used employee feedback, updating elements of the corporate culture and strengthening the values of sustainability and trust [10].

### **Conclusion.**

Corporate culture analysis is a complex and multifaceted process that requires a combination of both quantitative and qualitative methods for a comprehensive understanding of the cultural dynamics of an organization. Each method offers unique conclusions:

Quantitative methods, such as those developed by Cook and Lafferty (OCI), Cameron and Quinn (OCAI), Denison and O'Reilly et al., provide measurable, objective data that can identify areas of agreement and discrepancies between real and desired cultural characteristics. These tools are valuable for identifying patterns, making comparisons, and tracking progress over time. However, they can simplify cultural complexities and are not always able to identify deep, underlying problems.

Qualitative methods, such as those proposed by Edgar Schein, allow for a deeper exploration of the internal processes of an organization, exploring deeper levels of culture, such as beliefs, norms and values. These methods provide a more detailed and nuanced view of how employees perceive and interact with the culture of the organization. However, they can be time-consuming and subject to subjective interpretation.

The most effective approach combines both types of methods, which allows organizations to measure cultural traits and simultaneously explore the context behind them. Regardless of the methods used, the successful process of forming a corporate culture requires the active participation of management, a long-term vision and an individual approach reflecting the unique characteristics and goals of the organization. This integrated approach allows organizations to develop a culture that is consistent with their strategic goals and supports sustainable growth.

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# Female Leadership and Entrepreneurship in Portugal: Insights from the Media Sector

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## Abstract

Female entrepreneurship and leadership in Portugal have gained significant momentum, reflecting societal and economic shifts. This paper explores the evolution of female entrepreneurship, the rise of women in leadership roles, and the barriers they face. Data shows that women constitute 30% of entrepreneurs in Portugal, driven by targeted initiatives like financial incentives, training programs, and networking platforms. However, challenges such as gender stereotypes, work-life balance pressures, and limited mentorship opportunities persist. By addressing these barriers, Portugal can foster a more inclusive business environment. The findings aim to inspire action toward achieving gender equity in leadership and entrepreneurship.

## 1. Introduction

Female leadership and entrepreneurship have emerged as vital drivers of economic growth and societal progress. In Portugal, women are increasingly contributing to business innovation and occupying leadership roles. Despite these advancements, significant challenges remain, including systemic and cultural barriers that hinder their full participation. This paper delves into the evolution of female entrepreneurship in Portugal, the gradual ascent of women in leadership roles, and the obstacles they face, offering insights and recommendations for fostering gender equity (Fonseca et al, 2016).

## 2. Literature Review

### The Evolution of Female Entrepreneurship in Portugal

Over the past decade, female entrepreneurship in Portugal has experienced notable growth. Women now lead approximately 30% of startups and SMEs, spanning industries such as technology, sustainability, fashion, and food. Research highlights the impact of specific initiatives (Bello, 2021):

- **Financial Incentives and Support Programs:** Tailored funding options and tax benefits encourage women-led businesses.
- **Education and Training:** Universities and institutions provide workshops and courses to equip women with essential entrepreneurial skills.
- **Networking Platforms:** Women-focused networks offer mentorship, collaboration opportunities, and forums for sharing experiences. These initiatives have been instrumental in creating a more inclusive entrepreneurial landscape (Baptista, et al, 2024).

### 2. Female Leadership: A Gradual Ascent

3. Female representation in senior management has increased, driven by diversity and inclusion policies and the visibility of role models. Studies reveal that organizations with

gender-diverse leadership teams benefit from enhanced innovation and performance. However, male-dominated sectors such as engineering and technology lag in achieving gender parity (Mata and Dos-Santos, 2023).

#### 4. **Barriers to Female Leadership and Entrepreneurship**

5. Despite progress, systemic and cultural barriers persist:

- **Gender Stereotypes:** Leadership traits such as assertiveness are often perceived as masculine, leading to undue criticism of women leaders (Bello, 2017).
- **Work-Life Balance:** Women's disproportionate domestic responsibilities limit their capacity to engage in demanding roles.
- **Access to Mentorship:** The scarcity of mentorship opportunities further impedes career advancement (Bello, 2013).

### 3. **Methodology**

The study employs a mixed-methods approach, combining quantitative data analysis with qualitative insights from interviews with female entrepreneurs and leadership experts in Portugal. Secondary data from government reports, academic studies, and industry surveys complement the findings. The interviews explored the impact of targeted initiatives, challenges faced by women, and strategies for overcoming barriers.

### 4. **Results**

The main results outline confirm:

1. **Entrepreneurial Growth:** Female entrepreneurship has seen a steady rise, with 65% of respondents citing financial incentives and education as pivotal to their success.
2. **Leadership Representation:** While 45% of surveyed organizations have women in senior roles, gender parity remains elusive in technical fields.
3. **Challenges Identified:** Gender stereotypes and work-life balance issues emerged as the most significant obstacles, affecting over 70% of respondents.
4. **Role of Networks:** Women who participated in mentorship programs reported higher confidence and career advancement rates.

### 5. **Discussion**

The findings underscore the importance of addressing cultural and systemic barriers to female leadership and entrepreneurship. Financial support, targeted training, and robust mentorship programs are critical for empowering women. A cultural shift in perceptions of leadership and gender roles is also necessary to dismantle stereotypes.

### **Conclusion**

Female leadership and entrepreneurship in Portugal are on a promising trajectory. However, achieving gender equity requires sustained efforts to address existing barriers. This study highlights actionable strategies, including enhancing financial incentives, expanding mentorship opportunities, and promoting gender diversity in male-dominated fields. By fostering an inclusive environment, Portugal can unlock the full potential of its female leaders and entrepreneurs, driving innovation and economic growth.

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## Chemical Sciences

# THE OIL INDUSTRY IN KAZAKHSTAN

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**Annotation.** This article examines the oil industry in Kazakhstan. Oil fields and their production. Kazakhstan's oil industry remains an important component of the economy and the global market.

Kazakhstan is one of the world's oil producing countries. Oil production in Kazakhstan began at the end of the XIX century, much earlier than in Iran, Kuwait, Mexico, Norway, Saudi Arabia.

The Russian military, travelers and scientists were the first to note the high probability of finding industrial oil reserves in this region.

The Government of Kazakhstan has high hopes for the North Caspian project, namely Kashagan. With the start of commercial production of Kashagan, Kazakhstan will enter the top 5 largest oil producers in the world.

Prospects of Kazakhstan's oil industry after Kashagan is Kurmangazy. Unlike the neighboring Kashagan field, Kurmangazy is above-salt. This will greatly facilitate the development of Kurmangaza, since it will not require penetration through the salt layer.

Among the countries of the former Soviet Union, Kazakhstan has the largest deposits of liquid hydrocarbons after Russia. According to the data of the State Commission on Mineral Reserves of the Republic of Kazakhstan, the recoverable oil reserves in the country are estimated at 4.1 billion tons (30 billion barrels), including onshore deposits (more than 4 billion tons). Gas condensate reserves are estimated at 300 million tons. According to the Ministry of Oil and Gas of the Republic of Kazakhstan, the proven reserves of oil and gas condensate in the country reach 39.8 billion barrels (approximately 5.3 billion tons). If the current level of production and the volume of reserves remain unchanged, oil and gas production in the country can last for 70 years.

According to the Oil & Gas Journal, as of January 2014, Kazakhstan ranked 12th in the world in terms of oil reserves. Oil reserves in Kazakhstan were at the level of 30 billion barrels, or 4.1 billion tons, which is 1.8% of world reserves.

According to the Ministry of Oil and Gas of the Republic of Kazakhstan, Kazakhstan's hydrocarbon reserves may double due to exploration of the deep-lying horizons of the Caspian Basin. Until today, only the so-called pre-ship zones of this basin have been explored and explored.

There are 15 sedimentary basins in Kazakhstan, five of which are used for commercial purposes (they contain more than 65% of the country's recoverable oil reserves).

The subsequent increase in the country's resource base can be achieved through the development of offshore fields. The country's traditional oil-producing regions will not be able to compensate for the oil industry is a branch of the economy engaged in the extraction, processing, transportation, storage and sale of useful natural resources — oil and related petroleum products.

Related industries include: geophysics, drilling, production of oil and gas equipment, or the reduction in production in the future.

The purpose of oil refining is the production of petroleum products, primarily various fuels (automotive, aviation, boiler, etc.) and raw materials for subsequent chemical processing. Gasoline, kerosene, diesel fuel and technical oils are divided into different grades depending on the chemical composition. The final stage of refinery production is the mixing of the obtained components to obtain the finished product of the required composition. The main products of oil refining :

1. Petrochemicals (Plastics)
2. Asphalt
3. Diesel fuel
4. Fuel oil
5. Gasoline
6. Kerosene

### **Oil Reserves and Production**

Kazakhstan is endowed with substantial oil reserves, particularly in the western part of the country. The country is ranked among the top 20 oil producers globally, with proven reserves estimated at over 30 billion barrels, although some estimates suggest they could be higher. The major oilfields in Kazakhstan are located in:

**Tengiz:** One of the largest oil fields in the world, operated by Tengizchevroil (TCO), a joint venture between Chevron, ExxonMobil, and KazMunayGas, the national oil and gas company of Kazakhstan.

**Kashagan:** A giant offshore oil field in the Caspian Sea, which has seen significant development in recent years. Kashagan is one of the most complex and expensive oil projects in the world, with production starting in 2016.

**Uzen:** A major onshore field in the Mangystau region, historically one of the key contributors to Kazakhstan's oil production.

**Karachaganak:** A large oil and gas condensate field in the western part of Kazakhstan, operated by a consortium that includes Eni, Shell, Chevron, and KazMunayGas.

In recent years, Kazakhstan's oil production has fluctuated due to market conditions, technological challenges, and political factors, but it has remained a key player in the global energy market. As of 2023, Kazakhstan's daily oil production is around 1.7 million barrels per day (bpd), with plans to increase production over the next decade, especially in fields like Kashagan and Tengiz.

### **Export Markets**

Kazakhstan's oil exports are crucial to its economy. The country relies on pipelines, railways, and tankers to export its oil, primarily to Europe, China, and Russia. The main export routes are:

**The Caspian Pipeline Consortium (CPC):** This pipeline runs from Tengiz to the Russian port of Novorossiysk on the Black Sea and is the most important export route for Kazakh oil. It accounts for the bulk of Kazakhstan's oil exports.

**The Kazakhstan-China Pipeline:** A major pipeline that carries oil from Kazakhstan to China. This route is growing in importance as China continues to increase its energy imports from Central Asia.

**The Atyrau-Samara Pipeline:** A pipeline running from Kazakhstan to Russia, although this route is less significant than the CPC.

Kazakhstan also exports oil to other countries, including Turkey and several European countries, although its main focus is on Asia and Europe.

### **Investment and Foreign Partnerships**

The development of Kazakhstan's oil industry has been heavily reliant on foreign investment, with major international companies involved in exploration, production, and infrastructure projects. Some of the key players include:

**Chevron:** A key partner in Tengizchevroil, one of the largest oil ventures in Kazakhstan.

**ExxonMobil:** Also involved in Tengizchevroil and other oil ventures in the country.

**Shell, Eni, and TotalEnergies:** Companies involved in the development of fields like Kashagan and Karachaganak.

**Lukoil:** A Russian company involved in Kazakhstan's oil sector, including investments in the Caspian region.

Foreign investors have been drawn to Kazakhstan by its vast oil reserves, relatively low extraction costs, and strategic location. However, the sector has faced challenges, including regulatory uncertainty, fluctuating oil prices, and issues related to local content and environmental concerns.

### **Government and Regulation**

The government of Kazakhstan plays a central role in the oil industry through KazMunayGas (KMG), the state-owned oil and gas company. KMG is involved in the exploration, production, refining, and export of oil. The government also sets policies regarding taxes, royalties, and production quotas for foreign and domestic companies.

Kazakhstan has undergone significant regulatory reforms since independence to attract foreign investment, including tax incentives and the establishment of favorable contractual terms for joint ventures. However, there are still challenges with bureaucracy, corruption, and a lack of transparency that can deter some investors.

### **Challenges in the Industry**

While Kazakhstan's oil industry has seen significant growth, it faces several challenges:

**Geopolitical Risks:** Kazakhstan's oil industry is subject to geopolitical risks, particularly in its relationships with Russia, China, and other neighboring countries. Any instability in these regions can disrupt oil exports and investments.

**Infrastructure Limitations:** Kazakhstan's oil infrastructure, including pipelines, is sometimes stretched to its limits, making it difficult to increase exports significantly. Expanding infrastructure, such as pipelines to China and new export routes, is a key focus for the government.

**Environmental Concerns:** Oil extraction in Kazakhstan, especially in sensitive areas like the Caspian Sea, has raised environmental concerns. There have been calls for better regulatory oversight and more sustainable practices, though the government has taken steps to address these issues.

**Price Volatility:** As a major oil exporter, Kazakhstan's economy is highly sensitive to fluctuations in global oil prices. The volatility in oil markets affects government revenues and the stability of the broader economy.

### **Future Prospects**

Kazakhstan's oil industry is expected to continue growing in the coming years, especially as new fields like Kashagan ramp up production. The country has made significant investments in technology and infrastructure, which could help to unlock further potential.

**Kashagan and Tengiz:** Both fields are expected to see increased production, with Kashagan in particular having the potential to become a major contributor to global oil supply.

**Diversification of Energy:** The government is also focusing on diversifying its energy sector by investing in renewable energy sources and reducing reliance on oil exports in the long term.

**Conclusion.** Overall, Kazakhstan's oil industry remains an essential component of its economy and a key player in the global energy market, but it faces ongoing challenges related to infrastructure, investment, and political stability.

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## Psychological Sciences

# ОСОБЛИВОСТІ ПРОЯВУ ПОСТТРАВМАТИЧНИХ СТРЕСОВИХ РОЗЛАДІВ У РІЗНИХ КАТЕГОРІЙ ГРОМАДЯН-СВІДКІВ ВІЙНИ

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Визначено психологічні особливості прояву посттравматичних стресових розладів у громадян-свідків війни. Запропоновано класифікацію громадян-свідків війни з урахуванням ступеня залученості їх у військові події та територіальної ознаки перебування громадян-свідків війни.

Ключові слова: свідок війни, військові події, стрес від військових подій, ПТСР

Психологічна допомога громадянам-свідкам війни вже тривалий час є предметом наукових дискурсів у західних психологічних дослідженнях, оскільки в світі час від часу відбуваються військові конфлікти, які мають посттравматичні наслідки не тільки для комбатантів, але і для пересічних громадян-свідків війни. Це питання почало набувати наукових обертів і в Україні, особливо, починаючи з 2014 року. Військові події, які почались в той час на сході країни, а з лютого 2024 року – продовжились по всій території нашої держави та уже не перший рік призводять до постійної напруги, тривоги та фрустрації. При цьому слід зазначити, що населення нашої держави у своїй більшості стикається з ситуацією війни вперше, адже кількість свідків подій Другої світової війни, що ще залишалися живими, з кожним роком неухильно зменшується, а у військових подіях в Афганістані та країнах колишньої Югославії брали участь військові миротворці, тому наших пересічних громадян ці події практично не торкнулися. Відповідно, психологічні травми, з якими стикається український народ в останні роки через військові події, з одного боку, сприймаються людиною доволі гостро та чуттєво, а з іншого, у вітчизняній психологічній науці наразі недостатньо розглянуто питання надання таким людям якісної психологічної допомоги, що спонукає фахівців активно звертатися до передового західного досвіду.

Проведений теоретичний аналіз наукових праць з проблематики дослідження засвідчив, що вперше в науковий обіг поняття «стрес» ввів Г. Сельє як медичний термін для позначення загального адаптаційного синдрому. Згодом подальший розвиток досліджень в галузі стресу відбувався у працях Р. Лазаруса, С. Фолкман, Б. Голдстоуна, Т. Кокса тощо. Також низка дослідників досліджувала феномен стресу у взаємодії з такими психологічними категоріями, як пізнання, емоції та діяльність (Дж. Еверілл, П. Фресс, Р. Кан тощо). З позиції когнітивного підходу про стрес згадувалось у роботах А. Ейнштейна; психосоціального підходу – Р. Гріна та Б. Вілсона, інформаційну концепцію стресу розробив М. Горовиць. Також Дж. Гілтон, С. Палмер, Т. Пікеринг та ін. вивчали наслідки стресу, викликані професійною діяльністю. Крім того, актуальності сьогодні набирає питання управління стресами, відокремлюючись в окремий напрямок сучасної теорії управління (А. Файоль, П. Друкер,

М. Вебер тощо). З-поміж більш сучасних дослідників стресу та ПТСР важливо відмітити наукові здобутки таких фахівців як Н. Блезау, М. Гоффрей, К. Кастро, Р. Кесслер, Д. Кінг, Р. Маршалл, С. Мессер, В. Міхаель, Б. Перрі, Р. Сапольські, Е. Стівен, Дж. Тюнер, П. Уолкер, К. Фредерік, М. Фрідмен, К. Хоуг та ін.

Проблематику надання якісної психологічної допомоги особам, що пережили військові події, порушували такі вітчизняні дослідники як: А. Габінська, А. Гайдабрус, Є. Гриневич, О. Друзь, Д. Зубовський, О. Куліш, Г. Лазос, В. Омелянович, Н. Оніщенко, О. Самойлова, І. Сірик, Т. Соченко, І. Трубавіна, Х. Турецька, О. Хміляр, І. Черненко та ін.

Вітчизняні публікації останніх років стосувалися в основному проблем ВПО, як осіб, які перемістилися із зони активних бойових дій чи виїхали з окупованих територій, оскільки на таких територіях знаходиться небезпечно та навіть заборонено (уряд по можливості організовує евакуацію родин (особливо з дітьми) з таких регіонів, щоб врятувати їх життя та почати надавати допомогу (грошову, матеріальну, психологічну тощо). Такі особи є прямими свідками війни, оскільки на власні очі бачили ці екстремальні та травматичні для психіки людини події. Але, окрім внутрішньо переміщених осіб (ВПО), громадянами-свідками війни сьогодні стало практично все населення нашої держави, яке перебуває зараз на її території (або перебувало з початку повномасштабного вторгнення та змогло покинути територію країни). Це пояснюється тим, що навіть просто проживаючи у своїх домівках віддалено від лінії бойових дій, вони кожного дня піддаються масованим ракетним атакам, на власні очі бачать жахливі наслідки таких атак у своїх містах. Є серед них і такі, у кого травмувалися чи загинули різні, близькі, друзі тощо, хтось сам отримав травму чи інвалідність. Крім того, прямими свідками війни залишаються громадяни України, що залишились на тимчасово окупованих територіях та піддаються психологічному, а подекуди і фізичному (катування, полон) впливу з боку країни-агресора.

У найбільш широкому розумінні свідком вважають особу, яка стала очевидцем певної події, наприклад, злочину, та може про це розповісти з перших вуст (свідчити). У прив'язці до військових подій свідком війни слід вважати особу, що стала очевидцем певних військових подій (злочинів).

Вивчення цілої низки наукових досліджень переконливо свідчить, що у осіб з ПТСР внаслідок військових подій через наявне у них постійне нервово перенапруження та характерне для цього стану порушення сну (нічні кошмари, безсоння) з часом може розвиватися так званий «церебрастенічний синдром». Останній являє собою комплекс симптомів, серед яких превалюють виснаження центральної нервової системи, порушення з боку серцево-судинної, ендокринної, травної та інших важливих систем [1].

У процесі теоретичного дослідження також встановлено, що найбільш поширеним наслідком прояву ПТСР у свідків війни вважається нав'язливе згадування та завзяте уникнення будь-яких подій та ситуацій, що нагадують пережиті травматичні події. Цей процес також супроводжується постійними психологічними порушеннями, пов'язаними з пережитою травмою. Людина, не маючи можливості усвідомити та пропустити через себе ситуацію, яку раніше не переживала (як уже зазначалося, стан війни став несподіванкою для багатьох українців), просто запам'ятовує її, а також пов'язані з цією ситуацією власні переживання (в частині військових подій це можуть бути переживання, пов'язані із свистом падаючого снаряда, гулом військової техніки, звуками вибухів, жаром вогню тощо). Якщо інтенсивність таких переживань була занадто сильною для людини, вона стає дуже вразливою в психологічному відношенні.

Спектр симптомів ПТСР, що проявляються у людей за наслідками пережитих військових подій, включає в себе зміни, які відбуваються на основних чотирьох рівнях: фізіологічному, емоційному, когнітивному і поведінковому (табл. 1) [2; 3; 4 та ін.].

**Характеристика рівнів прояву ПТСР за наслідками військових подій**

Рівні прояву ПТСР	Характерні прояви
ФІЗІОЛОГІЧНИЙ	Порушення сну, часті пробудження вночі через кошмари; біль в животі, головні болі, що виникають не через фізичні причини; часте сечовипускання; травні розлади; нервові розлади; соматичні скарги та рецидиви.
ЕМОЦІЙНИЙ	Страх, фобії (у т.ч. специфічні, такі як виражена тривога або страх перебування в темряві, у замкненому просторі); почуття провини; формування уявлення про себе як про поганих людей; дратівливість, плаксивість; депресія.
КОГНІТИВНИЙ	Погіршення концентрації уваги, пам'яті; суїцидальні думки; бажання втекти подалі від реальності
ПОВЕДІНКОВИЙ	Різка зміна поведінки: повернення до поведінки, властивої більш молодшому та незрілому віку; втрата охайності; поява впертості, гніву, агресивності, ворожості, конфліктності; прояви поведінки страху або уникнення.

Характер та ступінь переживання військових подій у осіб різного віку також відрізняються. Так, для дитячого та підліткового віку найбільш типовими наслідками є регресивна поведінка (страх розлуки з батьками, страх перед незнайомими людьми, втрата наявних раніше засвоєних навичок), дратівливість. Часто можуть спостерігатися тенденції регресивної поведінки (енурез, смоктання пальця, більш виражена залежність від батьків). В юнацькому віці вони не завжди можуть вірно розказати про свої переживання, тому дослідники радять батькам та педагогам звертати увагу на невербальні ознаки наявності ПТСР: порушення сну, страх розлуки з батьками, страх при появі нагадування про травматичну подію (місця, людини, телевізійної передачі тощо), соматичні скарги, підвищена тривожність тощо. У дорослому віці наявні різні соматичні скарги, що не підкріплені органічною природою. А у осіб, які тривалий час не бачать своїх родичів, що беруть участь у військових подіях, зазначаються такі порушення, як депресія, нездатність відчувати задоволення, порушення соціальних контактів.

Відмітною особливістю переживання травматичних подій у дитячому віці є також те, що її переживають не тільки діти – безпосередні свідки, а і навіть діти, народжені матерями, що пережили такі події. Дослідники відмічають, що для таких дітей характерною є затримка емоційного та фізичного розвитку [2; 5 та ін.].

Автори робіт [4; 6; 7 та ін.] при вивченні психологічних особливостей формування поведінки сімей з ВПО звертають увагу на те, що запахи, музика, звуки, певні події або вчинки оточуючих – будь-що може нагадувати дитині про пережиті травматичні ситуації та провокувати рецидиви. Зазначені афективні переживання часто викликають у дітей соматизацію, що може супроводжуватись такими симптомами як головний біль та розлади травлення.

Таким чином, проведене теоретичне дослідження свідчить, що люди, які зазнали впливу травматичної події, пов'язаної з військовими діями, мають порушення в емоційно-вольовій, когнітивній, поведінковій сфері.

З урахуванням вищенаведеного, завданням даного дослідження вбачаємо також пошук можливостей класифікації громадян-свідків війни за певними класифікаційними ознаками. При цьому зазначимо, що належної класифікації у наукових джерелах нами не знайдено, що свідчить про недостатню розробленість даної проблематики та відкриває широкі можливості наукового пошуку.

У зв'язку з різноманітністю подій (ситуацій), в яких може опинитися свідок військових подій, пропонуємо класифікувати громадян-свідків війни, з одного боку, за ступенем їх залученості у військові події (у цьому контексті запропоновано легкий, середній та важкий ступені залученості), а з іншого – за територіальною ознакою перебування громадян (в Україні, за кордоном, на тимчасово окупованій території та на решті території країни-агресора). Результати такої систематизації представлено в табл. 2.

Таблиця 2.

Класифікація громадян-свідків війни (авторський підхід)

Ступені залученості громадян-свідків війни у військові події	На території України	За кордоном	На тимчасово окупованих територіях (ТОТ) та на решті території країни-агресора
Легкий	<p>1) громадяни, що проживають на неокупованій території України, які є свідками ракетних атак чи інших військових злочинів без тяжких руйнівних наслідків та смертей та уже вважають такий стан «звичними буднями»;</p> <p>2) громадяни із зони колишньої АТО (окуповані з 2014 року території Донецької та Луганської областей), які зараз проживають на неокупованій території України та до моменту виїзду ставали свідками ракетних атак чи інших військових злочинів без тяжких руйнівних наслідків та смертей.</p>	<p>1) громадяни, що виїхали на тимчасове або постійне місце проживання за кордон після повномасштабного вторгнення, які до моменту виїзду ставали свідками ракетних атак чи інших військових злочинів без тяжких руйнівних наслідків та смертей;</p> <p>2) громадяни із зони колишньої АТО (окуповані з 2014 року території Донецької та Луганської областей), які до моменту виїзду ставали свідками ракетних атак чи інших військових злочинів без тяжких руйнівних наслідків та смертей.</p>	<p>1) громадяни, які добровільно (за переконаннями чи з інших особистих причин) залишилися проживати на ТОТ або перемістилися в інше місце проживання на решті території країни-агресора, які бачили військові злочини без тяжких руйнівних наслідків та смертей.</p>

<p>Середній</p>	<p>1) ВПО, які змінили місце проживання в межах неокупованої території України, щоб убезпечити себе від військових подій, пов'язаних з проживанням на прифронтових територіях та територіях, що піддаються частим обстрілам;</p> <p>2) громадяни, що проживають на неокупованій території України, які є свідками ракетних атак та їх наслідків, що тягнуть за собою смерть та каліцтво інших людей (не з кола близьких та родичів);</p> <p>3) громадяни, що проживають на неокупованій території України, та пережили смерть і каліцтво малознайомих чи незнайомих людей.</p>	<p>1) громадяни, що виїхали на тимчасове або постійне місце проживання за кордон після повномасштабного вторгнення, які до моменту виїзду ставали свідками ракетних атак чи інших військових злочинів з руйнівними наслідками та пережили смерть чи каліцтво інших людей (не з числа близьких та родичів);</p> <p>2) громадяни із зони колишньої АТО (окуповані з 2014 року території Донецької та Луганської областей), які до моменту виїзду ставали свідками ракетних атак чи інших військових злочинів з руйнівними наслідками та пережили смерть чи каліцтво інших людей (не з числа близьких та родичів).</p>	<p>1) громадяни, які вимушено (без можливості виїхати на неокуповану територію України) залишилися проживати на ТОТ або перемістилися в інше місце проживання на решті території країни-агресора, які бачили військові злочини з руйнівними наслідками, що тягнуть за собою смерть та каліцтво інших людей (не з кола близьких та родичів).</p>
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Тяжкий	<p>1) ВПО, які виїхали з ТОТ, де ставали прямими свідками військових злочинів за участю військових країни-агресора, піддавалися постійним перевіркам, допитам та тортурам, бачили прямі військові зіткнення (бойові дії), розстріли, смерть чи травмування інших (можливо, мають власні фізичні травми та каліцтва внаслідок військових подій);</p> <p>2) громадяни, що проживають на неокупованій території України, проте ставали свідками тяжких воєнних злочинів (ракетні атаки з руйнівними наслідками), бачили смерть чи травмування інших (можливо, мають власні фізичні травми та каліцтва внаслідок військових подій);</p> <p>3) громадяни, що проживають на неокупованій території України, які втратили різних, близьких чи друзів.</p>	<p>1) громадяни, що виїхали на тимчасове або постійне місце проживання за кордон після повномасштабного вторгнення, які до моменту виїзду ставали свідками ракетних атак чи інших військових злочинів з тяжкими руйнівними наслідками та пережили смерть чи каліцтво близьких та родичів;</p> <p>2) громадяни із зони колишньої АТО (окуповані з 2014 року території Донецької та Луганської областей), які до моменту виїзду ставали свідками ракетних атак чи інших військових злочинів з тяжкими руйнівними наслідками та пережили смерть чи каліцтво близьких та родичів.</p>	<p>1) громадяни, які вимушено (без можливості виїхати на неокуповану територію України) залишилися проживати на ТОТ або перемістилися в інше місце проживання на решті території країни-агресора, які бачили військові злочини з тяжкими руйнівними наслідками, що тягнуть за собою смерть та каліцтво близьких та родичів.</p>
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Зазначимо, що запропоновану класифікацію можна вважати до певної міри умовною, оскільки ступінь переживання людиною стресу носить індивідуальний характер, тому одна і та ж травмуюча подія (наприклад, ракетна атака поблизу власного місця проживання з руйнівними наслідками) для однієї особи може стати тяжким ударом та змусити негайно переїхати в більш безпечне місце, а для іншої вже стала звичними буднями війни.

Крім того, вважаємо, що ВПО, які виїхали з ТОТ, однозначно мають тяжкий ступінь залученості у військові події у відповідності з тими видами стресових та травмуючих подій, які вони пережили.

Перспективою подальших досліджень визначено обґрунтування методичного інструментарію вивчення ступеня впливу пережитих військових подій на рівень та характер прояву ПТСР.

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# PROBLEMS OF THE INFLUENCE OF LANGUAGE CHOICE ON SELF-PERCEPTION AND PSYCHOLOGICAL WELL-BEING IN POSTCOLONIAL KAZAKHSTAN

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**Annotation:** This article is devoted to the study of the relationship of language and psychological well-being in postcolonial Kazakhstan, focusing on bilingual individuals navigating complex identities. It examines how language choice between Kazakh and Russian influences self-concept and mental health, providing insight into the psychological impacts of linguistic identity in a postcolonial context. By investigating these dynamics, the study aims to shed light on how bilingual individuals reconcile competing cultural and linguistic identities and cope with potential conflicts between national and post-Soviet influences. This work contributes to broader discussions on the role of language in shaping identity and well-being, especially in societies undergoing cultural and linguistic reclamation after colonial influence.

**Key words:** language choice, self-perception, psychological well-being, bilingualism, postcolonial identity, cultural identity, Kazakh language, Russian language, Kazakhstan, linguistic identity, identity conflict, mental health, Post Soviet influence, language and psychology, cultural reclamation.

## Introduction

The connection between language and psychological experience is of great importance in postcolonial societies, where language often embodies both cultural heritage and historical trauma. In Kazakhstan, a country marked by the Soviet past, the coexistence of the Kazakh and Russian languages creates a unique psychological landscape. This bilingual language environment affects self-perception, identity formation, and psychological well-being.

In postcolonial Kazakhstan, language is more than a communication tool; it is a prism through which people look at themselves and the world. The choice between Kazakh and Russian has cultural significance, historical weight and psychological nuances. Each language carries its own emotional and symbolic load, shaping how people perceive their identity, communicate with other people and navigate difficult situations, still experiencing their colonial past.

For many Kazakhstanis, the decision to speak Kazakh or Russian reflects an internal dialogue about belonging and self-worth. The Kazakh language, revived as a national language, embodies cultural identity, pride and independence. Nevertheless, Russian, which was long considered the language of communication during Soviet rule, provides access to global networks, professional opportunities and social prestige. This duality creates a deep psychological landscape in which language choices can evoke feelings of empowerment, alienation, or even conflict.

Imagine a bilingual person who switches from Kazakh to Russian depending on the context. Although the Kazakh language can evoke a sense of cultural pride, it can also cause insecurity if its fluency is considered insufficient — an experience associated with decades of linguistic marginalization during the Soviet era. Conversely, knowledge of the Russian language can open professional doors, but it can also lead to accusations of cultural disloyalty, especially in light of Kazakhstan's efforts at post-colonial state-building. This balancing act is not only linguistic in nature; it is closely related to self-perception, social relationships, and psychological well-being.

The psychological risks are especially high for the younger generations who inherit this linguistic heritage. Many grow up in an environment where Russian dominates formal education and urban life, while Kazakh is positioned as the language of traditions and family. Navigating these contrasting areas requires constant alignment of identity, which often leads to a feeling of being “in the middle” — full belonging to neither language, but a deep influence of both.

In this postcolonial context, language is both a burden and a bridge. It can serve as a means of communication with one's roots or as a reminder of historical enslavement. The way bilingual people navigate this dynamic sheds light on the profound impact of language on psychological stability, emotional well-being, and the formation of a holistic sense of self.

*The purpose of the study.* The purpose of the study is to analyze the impact of the choice of Kazakh and Russian languages on the perception of the world and psychological well-being in postcolonial Kazakhstan. This research examines the complex relationship between language preferences and identity formation in socio-historical conditions shaped by colonial heritage. Do people who speak Russian or Kazakh demonstrate differences or similarities in self-perception, social integration, identity?

Considering these results in the broader socio-political and historical context of postcolonial Kazakhstan, the study's authors will consider how the colonial past influenced modern linguistic practices and identity constructs. The results of this study are intended to contribute to the scientific discourse on language, identity, psychological health in postcolonial societies and serve as a basis for developing of policies aimed at strengthening social cohesion and psychological well-being in multilingual and postcolonial contexts.

*Literature review.* The study “We feel better when we speak common language. Affective well-being in bilingual adolescents from three ethnic groups in Indonesia” reveals the issues of the connection between languages and psycho-emotional well-being, perception of the world. The authors found that despite the vocabulary, there is a relationship between language and well-being. For example, the national language increased the level of psychological well-being, while the use of ethnic languages did not. Bilingualism plays an important role, but still the national language is more important than the ethnic one.

According to the study “The Languages We Speak Affect Our Perceptions of the World” by O. Mykhailyuk and Y. Pohlod, language and thought are related, and language influences how we perceive the world. The writers draw the conclusion that linguistic structure influences our perceptions and thoughts about the world based on Benjamin Whorf's thesis. Additionally, it has been objectively demonstrated that a native speaker's perception of space and critical life decisions are influenced by the language they use. Self-identification is intimately tied to the statement that every language is a unique individual. Speaking a second language causes people to embrace new cultural perspectives and modify their point of view.

Using a hybrid methodology, the authors Fakhrul Abedin Tanvir and Mahabuba Islam Mitu in the study “Language and Mental Health: Investigating the Relationship between Linguistic Expression and Psychological Well-being” investigate the relationship between language and mental health and pinpoint trends that either support or undermine psychological well-being. The study offers important insights into transformative potential by concentrating on both positive and negative language habits. This study emphasizes the significant influence that language

expression has on mental health. Positive language has been shown to improve mental health, whilst negative language has been shown to exacerbate emotional discomfort. Notwithstanding its shortcomings, the study establishes the groundwork for further investigations and treatments that use language as a means of enhancing mental health.

*Methodology.* Both quantitative and qualitative approaches are useful when examining how language choice affects psychological health and self-perception in postcolonial Kazakhstan. When it comes to gathering numerical data that shows patterns and trends in huge populations and makes comparisons and generalizations easy, quantitative approaches are very helpful. In line with the historical background of Russian supremacy in the area, the demographic breakdown of participants' language usage and proficiency levels, for example, provide an empirical basis for comprehending the pervasiveness of Russian over Kazakh in day-to-day interactions. This approach enables us to measure the degree of proficiency in each language as well as the proportion of people who experience psychological effects associated to language, such as mood swings or identity changes during language switching.

Conversely, qualitative approaches deepen our comprehension by examining the subtleties of unique experiences and the underlying psychological processes at work. The intricacy of the relationship between language and personal well-being is demonstrated by the responses we received on the emotional consequences of language choice, such as discomfort or identity conflict. Qualitative data reveals the richness of individual experience that may be overlooked in strictly quantitative research, such as the psychological duality experienced by multilingual people.

Although both approaches are significant, the quantitative approach is the main focus of our investigation. This gives us a more comprehensive understanding of how language affects identity and well-being in postcolonial Kazakhstan by enabling us to quantify the frequency of specific linguistic patterns and psychological trends over a sizable sample. Although a more thorough understanding might be obtained by combining both approaches, the quantitative approach is still essential to the study's objectives.

So, in our study, we conducted a survey between students of 1-4 courses of the university. The content of the questions was as follows:

1. Demographics and Language Background

- What is your first language?
- Which language do you consider your primary language for daily communication?
- How fluent are you in Kazakh? (Scale: Beginner to Native)
- How fluent are you in Russian? (Scale: Beginner to Native)
- Do you come from a predominantly Kazakh- or Russian-speaking family background?
- Do you use Kazakh or Russian more often in various contexts (e.g., at home, work, school, social interactions)?

2. Language and Self-Perception

- Which language do you feel more “yourself” in, and why?
- Do you feel a shift in your personality when you speak Kazakh versus Russian? (Please describe.)
- Does speaking Kazakh or Russian affect your confidence or sense of authenticity?
- On a scale from 1 to 5, how strongly do you feel that language shapes your self-image?
- Do you feel that certain aspects of your identity (e.g., cultural, personal, social) are tied to speaking either Kazakh or Russian?

3. Psychological Well-Being

- How comfortable do you feel expressing personal or emotional matters in Kazakh vs. Russian?
- Does speaking Kazakh or Russian affect your mood or sense of well-being?

- Have you experienced any psychological stress related to choosing which language to speak in certain contexts?
- Do you feel that speaking one language over the other affects your relationships with others? (Scale: Never, Rarely, Sometimes, Often, Always)
- Do you feel any pressure from family, friends, or society to use a particular language? If so, how does this impact you emotionally or psychologically?

4. Identity and Belonging

- Do you feel more connected to Kazakh or Russian culture? (Please explain.)
- Do you experience any internal conflict regarding your language choice?
- On a scale from 1 to 5, how much does language impact your sense of national identity?

*Finding and analysis. Implications.* 30 - 45 1st - 4th year students took part in the survey.

We have presented their answers in the form of a diagram below:

1. Demographics and Language Background

Diagram 1.

What is your first language?

43 ответа

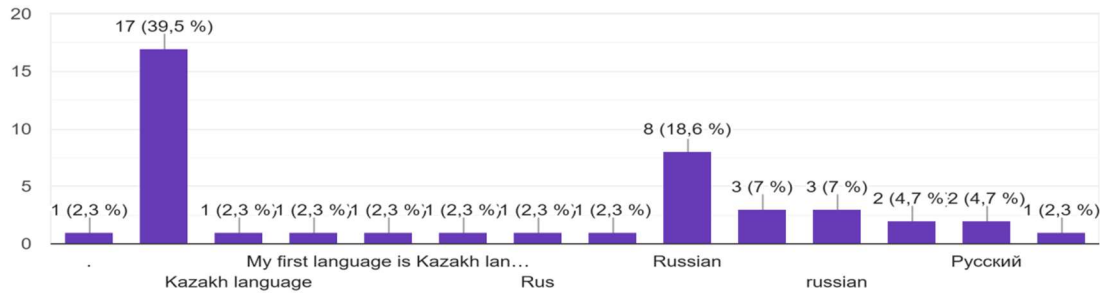


Diagram 2.

Which language do you consider your primary language for daily communication?

43 ответа

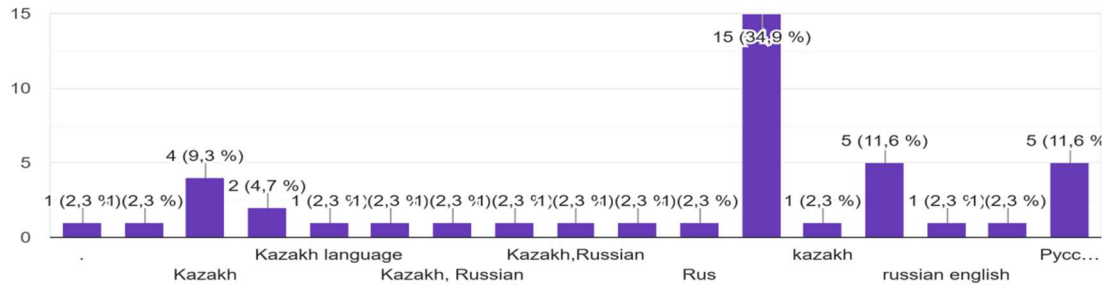


Diagram 3.

How fluent are you in Kazakh? (Scale: Beginner to Native)

43 ответа

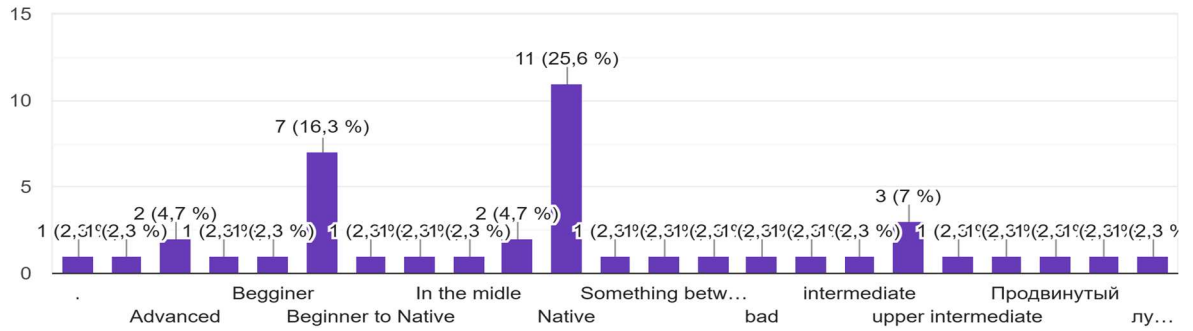


Diagram 4.

How fluent are you in Russian? (Scale: Beginner to Native)

43 ответа

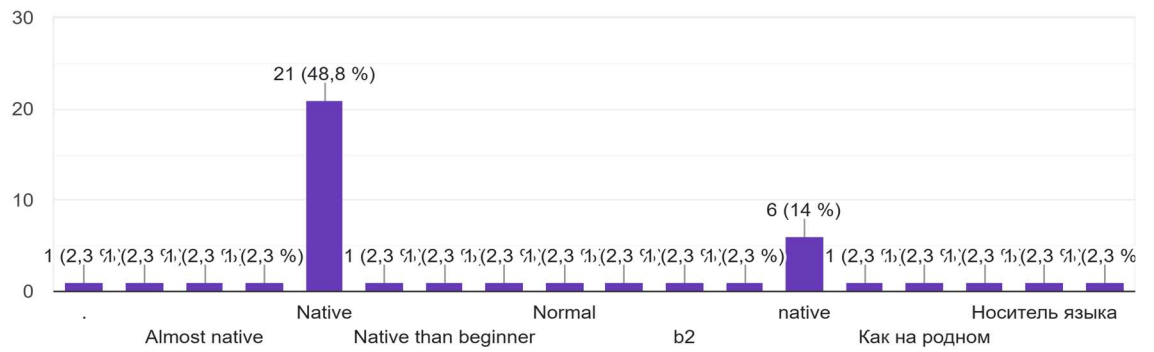


Diagram 5.

Do you come from a predominantly Kazakh- or Russian-speaking family background?

43 ответа

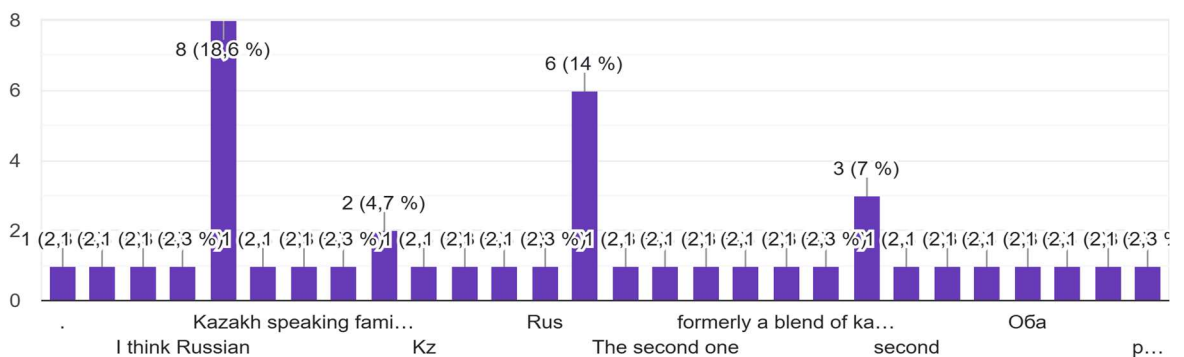




Diagram 8.

Do you feel a shift in your personality when you speak Kazakh versus Russian? (Please describe.)  
33 ответа

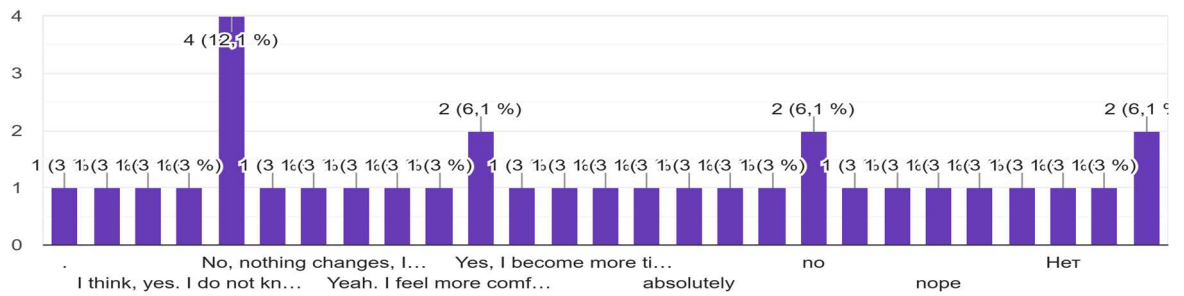


Diagram 9.

Does speaking Kazakh or Russian affect your confidence or sense of authenticity?  
33 ответа

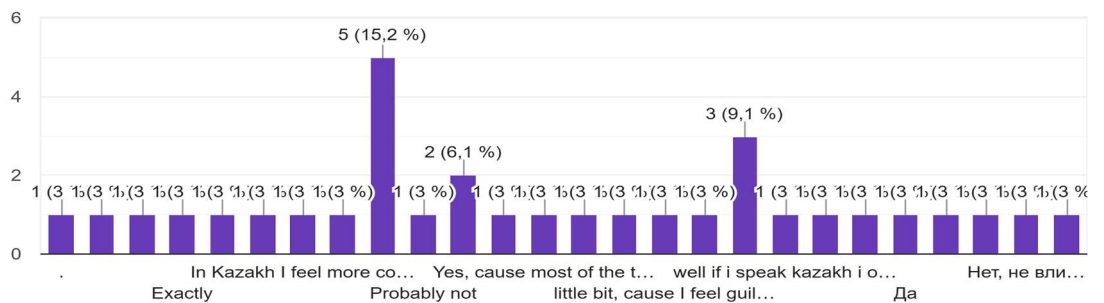


Diagram 10.

On a scale from 1 to 5, how strongly do you feel that language shapes your self-image?  
33 ответа

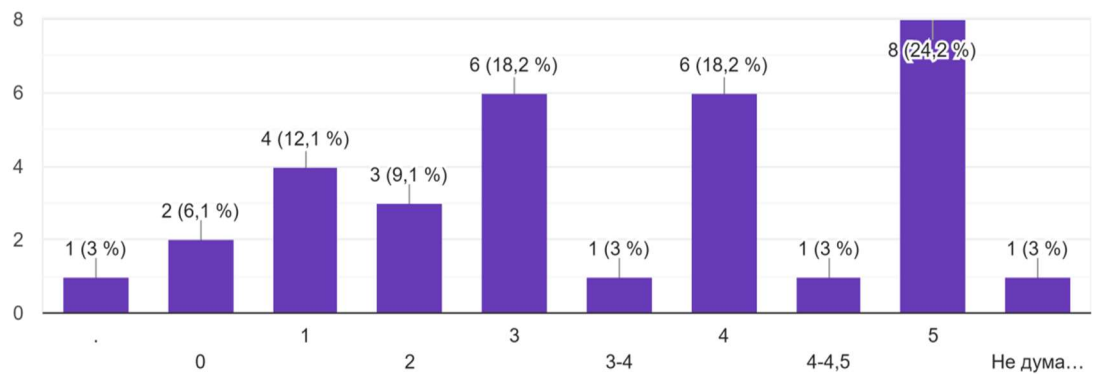
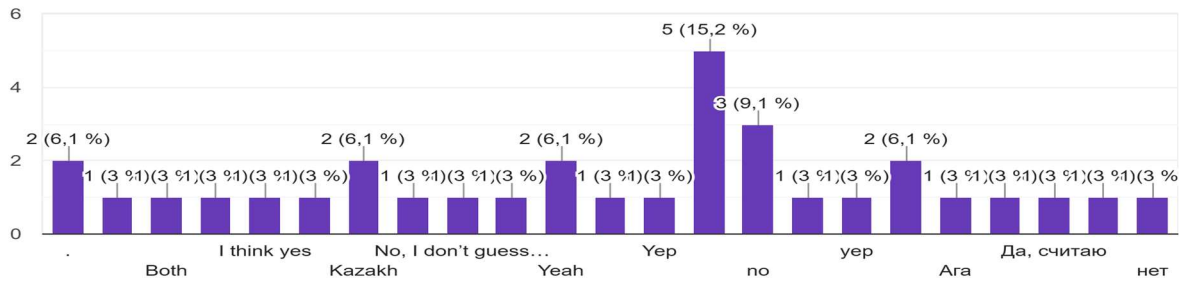


Diagram 11.

Do you feel that certain aspects of your identity (e.g., cultural, personal, social) are tied to speaking either Kazakh or Russian?

33 ответа



In terms of self-perception, responses suggest that bilingual individuals in Kazakhstan navigate complex relationships with language. While 21 participants report feeling more "themselves" in Kazakh, and 19 in Russian, this division underscores the psychological duality many individuals face. The split between those who feel a shift in personality when switching languages (20 "yes" vs. 20 "no") further complicates the issue, suggesting that language is not only a tool of communication but also deeply intertwined with individual identity. The majority (24 participants) also agree that language influences their confidence and authenticity, a finding that points to the psychological weight attached to language use in shaping personal and social identity. This sense of self is further tied to linguistic boundaries, as 20 participants acknowledge that aspects of their identity are closely linked to speaking either Kazakh or Russian.

### 3. Psychological Well-Being

Diagram 12.

How comfortable do you feel expressing personal or emotional matters in Kazakh vs. Russian?

36 ответов

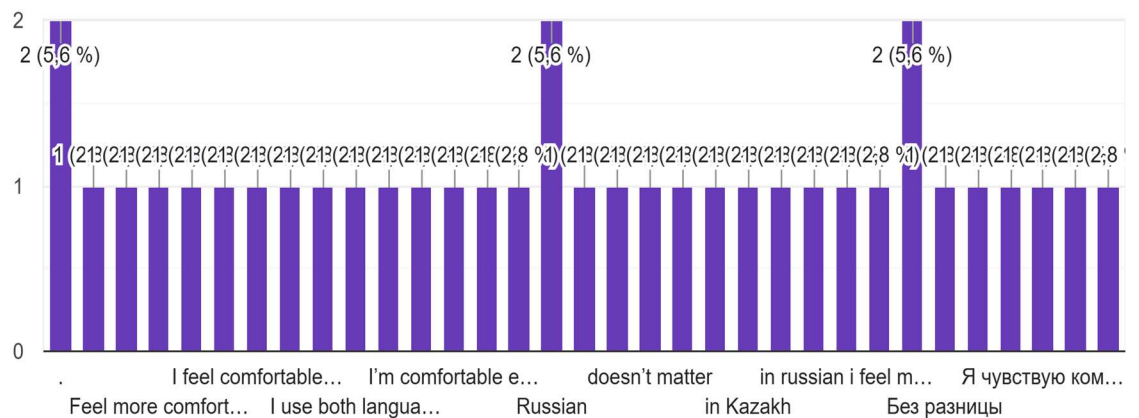


Diagram 13.

Does speaking Kazakh or Russian affect your mood or sense of well-being?

36 ответов

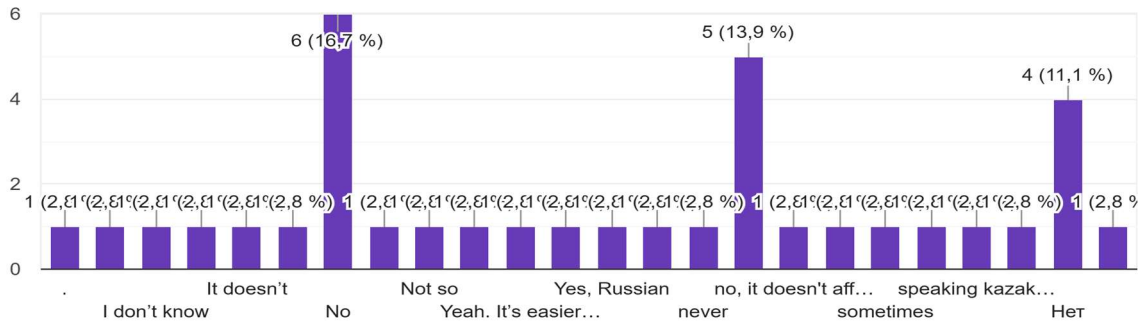


Diagram 14.

Have you experienced any psychological stress related to choosing which language to speak in certain contexts?

36 ответов

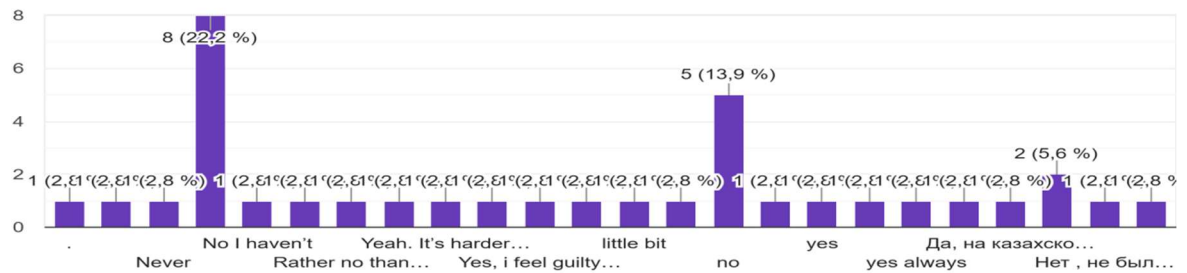
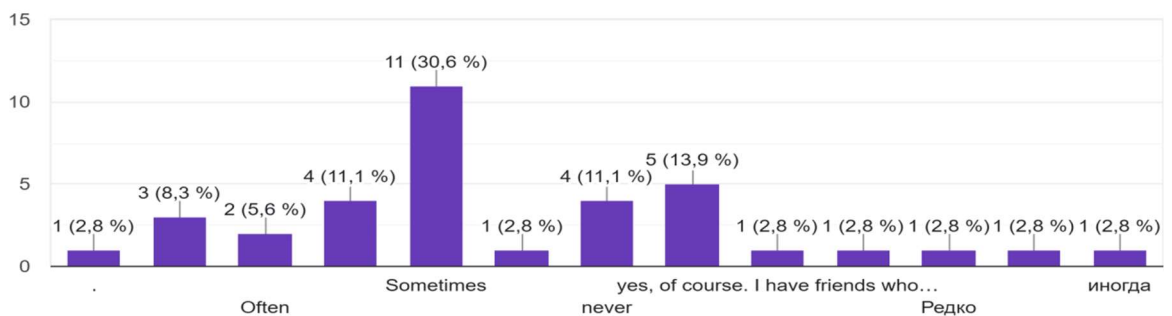


Diagram 15.

Do you feel that speaking one language over the other affects your relationships with others?

(Scale: Never, Rarely, Sometimes, Often, Always)

36 ответов



Psychological well-being, however, is not immune to the pressures of language choice. While 30 participants do not report mood changes based on language, 10 express that their emotional state is affected, signaling the potential psychological cost of language switching. Additionally, the discomfort expressed by some participants when choosing which language to use in certain contexts (15 participants experienced stress) implies that the societal and familial expectations to choose one language over another can create tension. The strong sense of pressure to conform to societal expectations, with 15 participants feeling high levels of pressure, has serious implications for individual well-being, as it may foster feelings of guilt, exclusion, or

identity conflict. These emotional challenges, particularly when navigating between two languages, reflect the broader societal divisions in postcolonial Kazakhstan, where language use becomes a symbol of belonging, power, and cultural identity.

### **Conclusion**

The present paper examines the complex interaction between language choice, individual identity, and mental health in post-colonial Kazakhstan. Bilingual individuals face an opposition between Kazakh, symbolizing cultural dignity and independence, and Russian, symbolizing the vestiges of Soviet control. The findings show that language choice is strongly related to identity because participants reported a change in self-identification with language shifts. This diglossia can lead to psychological problems, such as stress and anxiety, since the people will face societal pressures to adhere to one language and not the other.

The research underscores the emotional repercussions associated with bilingualism, wherein language transcends its role as a mere communication medium and influences personal identity and psychological health. These results further enrich the extensive discourse concerning the psychological effects of language within postcolonial contexts, accentuating the necessity to confront the difficulties involved in reconciling conflicting cultural and linguistic identities.

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2. The Languages We Speak Affect Our Perceptions of the World. O.Yu. Mykhailyuk, H.Ya. Pohlod. 2020
3. "Language and Mental Health: Investigating the Relationship between Linguistic Expression and Psychological Well-being". Fakhru'l Abedin Tanvir and Mahabuba Islam Mitu in the study. 2024

## Culturology

# ПОСТАНОВКА ПРОБЛЕМЫ ГОСУДАРСТВЕННОГО ЯЗЫКА В РЕСПУБЛИКЕ КАЗАХСТАН: КРАТКИЙ ЛИНГВОКУЛЬТУРОЛОГИЧЕСКИЙ ЭКСКУРС ЯЗЫКОВОМУ ЗАКОНОДАТЕЛЬСТВУ

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Впервые вопрос о языковом строительстве, механизмах реализации языковой политики в республике был поднят после принятия в 1989 году *«Закона о языках в Казахской ССР»*. На наш взгляд, данный документ не только закрепил за собой постановку вопроса языка и изменяющейся языковой действительности, но и заложил фундамент будущих политических и научных дебатов, относительно социокультурного статуса казахского и других языков.

Государственная языковая политика в Казахстане регламентирована законодательными документами, которая включает: Конституцию Республики Казахстан (1995), Концепцию языковой политики Республики Казахстан (1996г.), Закон Республики Казахстан «О языках в Республике Казахстан» (1997г.), Государственную программу функционирования и развития языков (1998г., 2001г.), Концепцию расширения сферы функционирования государственного языка, повышения его конкурентоспособности на 2007-2010 годы, Государственную программу развития и функционирования языков в Республике Казахстан на 2011-2020 годы и другие документы, регулирующие государственно-правовые аспекты языковых отношений.

Рассмотрим вкратце важнейшие законодательные и нормативные акты, определившие языковое строительство в Республике Казахстан за годы суверенитета.

В *Концепции языковой политики Республики Казахстан от 4 ноября 1996 года* был дан анализ языковой ситуации в Республике Казахстан на тот период. Определена цель Концепции – «разработка стратегии государственной политики в области сохранения и функционального развития языков в переходный период, определение задач государства по созданию условий для развития казахского языка как государственного» [1].

В качестве задач было намечено определение приоритетных направлений языкового развития и выработка механизма функционирования языков. Подчеркивалось, что формирование языковой ситуации обусловлено различными обстоятельствами, в том числе взаимодействием языковых и неязыковых (социальных, политических, экономических, психологических, исторических, географических и иных) факторов.

*Особо подчеркивался тот факт, что статус казахского языка как государственного лишь декларирован, но не подкреплён в достаточной мере механизмом, который обеспечил бы его повсеместное изучение и использование.*

Известно, что десятилетиями функционирование казахского языка ограничивалось несколькими языковыми подсистемами, что было обусловлено объективными социально-политическими факторами, поэтому в концепции ставится проблема расширения его возможностей в отображении новых **социокультурных** реалий путем взаимодействия с другими мировыми языками, а также путем использования в этом внутреннего потенциала языка.

В Концепции прописываются характеристики государственного языка, функции, сферы его применения, правовой статус. Указывалось, что требования к государственному языку и его статусу, изложенные выше, должны стать основными параметрами модели, к которой должен постепенно, последовательно приближаться казахский язык. **Со временем казахский язык должен был стать языком межнационального общения.** Исходя из постулата, что «государственная политика в отношении создания условий для развития языков должна быть ориентирована на корректировку реально существующей иерархии языков в направлении приоритетного развития государственного языка», следует, что «задачи государства по отношению к государственному и другим языкам будут различны». [1]

Значительное место было уделено проблеме научного и научно-методического обеспечения статуса казахского языка как государственного, в том числе отмечалось, что социологический и социолингвистический мониторинг должен обеспечить постоянную коррекцию языковой политики и статус государственного языка, расширяющий его социальные функции, требует серьезного научного анализа происходящих в нем инновационных изменений. [1]

Представляет большой **лингвокультурологический интерес** один из первых принятых в суверенном Казахстане законов - «О Языках в Республике Казахстан» (от 11.07.1997 г.), в котором говорится об **объявлении всех языков народов Казахстана национальным достоянием, историко-культурным наследием страны.**

В Государственной программе функционирования и развития языков на 2001-2010 годы, принятой Указом Президента Республики Казахстан от 7 февраля 2001 года N 550, были определены стратегические цели и задачи языкового строительства в Казахстане на долгосрочную перспективу, а также намечены основные направления, конкретные механизмы реализации языковой политики, проблемы экономической поддержки развития государственного и других языков, функционирующих на территории Республики. Конкретные действия по осуществлению намеченных целей, задач и приоритетов разрабатываются в форме двухгодичных краткосрочных планов мероприятий по реализации Программы (на 2001-2002, 2003- 2004, 2005-2006, 2007-2008, 2008-2009гг.).

В Программе были оговорены направления долгосрочного языкового строительства: «В соответствии с функциональным принципом формирования лингвистического поля в республике, закрепленным Конституцией Республики Казахстан и нашедшим отражение в Законе «О языках в Республике Казахстан, целесообразно осуществление языкового строительства по трем направлениям на основе дифференцированного подхода: расширение и укрепление социально - коммуникативных функций государственного языка; сохранение общекультурных функций русского языка; развитие других языков народов Казахстана». [2]

В Программе также подчеркивалось, что сугубо административные методы развития языка, не подкрепленные дополнительными мерами стимулирующего характера, оказались недостаточно эффективными. Необходима разработка правовых основ для создания эффективной системы мер по материальному поощрению работников государственных органов, организаций и учреждений, использующих государственный язык в своей работе. Решение данного вопроса должно стать одним из наиболее действенных механизмов для

овладения государственным языком. *Подчеркивалось необходимость поэтапного перехода к составлению документации в государственных органах на государственном языке в соответствии с централизованно утвержденным долгосрочным планом. **Официальные международные встречи должны проводиться на государственном языке.*** [2]

Следующий рассматриваемый документ – «Концепция расширения сферы функционирования государственного языка, повышения его конкурентоспособности на 2007-2010 годы» - был разработан и одобрен постановлением Правительства Республики Казахстан от 21 ноября 2007 года N 1122.

Остановимся на некоторых важнейших положениях этой концепции. В Концепции приводятся показатели позитивных изменений в области языкового строительства, вместе с тем аналитическая часть Концепции отличается *критической* направленностью. В частности, отмечается наличие в обществе стереотипа, когда определение функционального назначения языка ставится в зависимость от степени его распространенности, количества носителей и других факторов. Указывается, что отдельные попытки анализа сложившейся ситуации основываются на формальных, количественных показателях документооборота с упором на государственный язык в государственных органах и учреждениях, объемов передач электронных средств массовой информации, выпуска периодических печатных изданий на двух языках, как правило, в меньшем объеме и с материалами низкого качества на государственном языке.

Подготовка документов в центральных государственных органах на государственном языке составляет всего лишь 20 - 30 %, а общий документооборот - 45 - 50 %. Показатели, сложившиеся в делопроизводстве местных исполнительных органов, также не отражают адекватную языковую ситуацию в регионах. Даже в регионах с подавляющим большинством казахского населения основная нагрузка при этом ложится на специалистов - переводчиков этих институтов.

Констатируется нехватка специалистов - преподавателей казахского языка, так же, как и специалистов – переводчиков. В документе отмечается, что многие электронные СМИ формально относятся к выполнению норм законодательства. В качестве проблемы названо низкое качество многих передач, отсутствие актуальности, привлекательности программ, которые не могут способствовать формированию культуры языка и речи, в конечном счете, его успешному овладению. «В средствах массовой информации необходимо исключить языковую безграмотность, умело и уместно применять термины, преодолевать монотонность и назидательный характер передач, увеличить объем оригинальных программ на государственном языке, уделять внимание семейному воспитанию и т.д.».[3]

29 октября 2010 года Президентом Республики Казахстан был издан указ о *Государственной программе развития и функционирования языков в Республике Казахстан на 2011-2020 годы*. В данном документе речь шла о развитии языков в новых условиях, совершенствование нормативно-правовой базы, направленной на усиление институционального статуса казахского языка как государственного, на сохранение социолингвистической активности русского языка и на развитие английского языка как средства интеграции в мировое пространство. Основными программными целями были заявлены:

1. Государственный язык - главный фактор национального единства;
2. Популяризация широкого применения государственного языка;
3. Развитая языковая культура - потенциал интеллектуальной нации;
4. Развитие лингвистического капитала казахстанцев.

Анализируя направления Программы, можно сделать вывод, что основной акцент был сделан на следующих моментах: совершенствование и стандартизация методологии

обучения государственному языку; развитие инфраструктуры обучения и стимулирование процесса обучения государственному языку; повышение престижа и востребованности употребления государственного языка; усовершенствование и систематизация лексического фонда казахского языка; сохранение функционирования русского языка в коммуникативно-языковом пространстве; сохранение языкового многообразия в Казахстане; изучение английского и других иностранных языков. Реализация Программы должна будет осуществляться в три этапа: 1-ый этап -2011 - 2013 г.г.; 2-ой этап - 2014 - 2016 г.г.; 3-й этап - 2017 - 2020 г.г.

В Программе были выделены показатели, к которым должна привести целенаправленная языковая политика: доля взрослого населения, владеющего государственным языком к 2017 году - 80 %, 2020 году - 95 %); доля взрослого населения республики, владеющего русским языком к 2020 году - 90 %); доля населения республики, владеющего английским языком к 2014 году - 10 %, 2017 году - 15 %, 2020 году - 20 %); доля населения, владеющая тремя языками (государственным, русским и английским) к 2014 году - 10 %, 2017 году - 12 %, 2020 году - 15 %).

Представляет интерес для исследователя в данном документе положение, что особо актуальной является необходимость создания системы, описывающей лексический и грамматический строй языка, а также фиксирующей процессы непрерывных языковых изменений.

Необходимым компонентом повышения уровня языковой культуры казахстанцев должно стать развитие культуры речи. Также государственная политика нацелена на формирование «лингвистического капитала каждого казахстанца», состоящего из трех компонентов: казахского-русского-английского. [4]

Оценивая языковое планирование в Республике Казахстан как успешное, казахстанские социолингвисты (Э.Д.Сулейменова, Н.Ж.Шаймерденова, Д.Х.Аканова) детально анализируют причины, обусловившие такие результаты. В числе главных причин ученые называют политическую и экономическую стабильность в обществе и улучшение социально-экономической ситуации в республике, изменение общей этнодемографической ситуации в стране, действенность избранных инструментов языкового планирования, конструктивное использование законодательных механизмов, последовательную языковую политику в сфере образования, осуществление квалификационно-аттестационных мероприятий, административное регулирование, взвешенную деятельность различных субъектов планирования, содействие общества языковому планированию.

Анализируя такой фактор, как содействие общества языковому планированию, авторы выделяют три периода в изменении общественных настроений. Первый период характеризовался нечувствительностью к сложностям конкретной языковой ситуации, сложившейся к тому времени, склонностью к простым решениям и крайним средствам изменения языковой ситуации. «Резкий разрыв с существующей традицией и ожидание быстрой победы – функционирования государственного языка во всех сферах в полном объеме его вдохновляли одних, другие же в это время высказывали нескрываемые опасения и страх за судьбу русского языка и будущее своих детей, а также муссировали суждения о том, что казахский язык якобы «не готов исполнять предназначенную ему роль государственного языка» Вторым был период нетерпеливого ожидания, разочарования. Третий период характеризуется взвешенным отношением к динамике процессов языковых жизни. Пришло понимание невозможности радикальных изменений в языковой ситуации в краткие сроки, стала осознанной мотивация к изучению казахского языка, а также необходимости учета возрастных особенностей разных групп населения и дифференцированного подхода к ним. [5, 60-61]

По мнению вышеназванных ученых, изменился и фокус объектов языкового планирования. Если вначале ими были объявлены все группы населения страны, то позже большие ожидания и повышенные требования стали предъявляться к *русскоговорящим казахам и к младшим поколениям казахстанцев*. Изменение вектора языковой политики ученые оценивают как стратегически верное: оно поддерживается самими русскоязычными казахами из-за возросшего этнического и языкового самосознания и снижает давление на представителей других этносов.

Таким образом, в настоящее время социально-политические реалии Казахстана как суверенного государства требуют языковой политики, отвечающей потребностям полиэтнического населения страны и учитывающей особенности языковой, культурной, демографической и политической ситуации. Характер и способы разрешения языковых и лингвистических проблем, составляющих содержание языковой политики Казахстана определяются интересами определенных классов, этнических общностей, политическими и идеологическими целями в области культуры.

По нашему мнению, эффективность языковой политики зависит не только от социально-политических, но и **культурных** факторов.

Мы отмечаем, что изучение современной языковой ситуации в Казахстане с точки зрения лингвокультурологии является одной из актуальных задач. На сегодня в Казахстане сложилась ситуация двуязычия, когда большая часть населения страны владеет казахским и русским языками, и языковая ситуация страны представлена в основном билингвизмом и бикультурализмом. Можно предположить, что расширение сферы государственного казахского языка в Казахстане стало возможным не только за счет деятельности государства, но также за счет **роста функциональности казахского языка, повышения его культурного статуса** в среде нетитульных этносов.

В феврале-марте 2013 года группа ученых провела анкетный опрос населения в 7 регионах Казахстана. На вопрос: «Как Вы думаете, что в первую очередь объединяет понятие «казахский»?» 76,0% респондентов ответили, что это язык. Как видно, для 76% опрошенных, представляющих различные этнические группы казахстанского общества, язык является центральным этнодифференцирующим признаком. ***Следовательно, по мнению исследователей, в анализе трансформации национального сознания и национальной идентичности важным является выявление значимости и функционирования языка, в первую очередь родного.*** [6]

Как мы видим, языковой вопрос в РК остается актуальным. На данный момент казахский язык переходит на латиницу. Что приобретет язык на этот раз, какую культуру она будет формировать и распространять – вопросы, которые требуют всестороннего исследования ученых разных направлений.

Какую роль сыграют языковые процессы, происходящие в современном Казахстане на формирование культуры Казахстана – покажет время.

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## Medical Sciences

# БУЛЛИНГ ОҚУШЫЛАР АРАСЫНДА ЖАРАҚАТТАН КЕЙІНГІ СТРЕССТІК БҰЗЫЛЫСТЫҢ ЖӘНЕ СУИЦИДТІҢ ДАМУ ҚАУПІНІҢ ФАКТОРЫ РЕТІНДЕ

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### Аннотация

Оқушылар арасындағы буллинг – бұл физикалық, вербалды немесе психологиялық зорлық-зомбылықтың кең таралған түрі, ол олардың психикалық және физикалық денсаулығына айтарлықтай әсер етеді. Зерттеулер буллингтің жарақаттан кейінгі стресстік бұзылыс (ЖКСБ) және суицид сияқты ауыр салдарларға әкелуі мүмкін екенін көрсетеді. Бұл шолуда буллингтің осы екі ауыр салдарымен байланысы, оның статистикасы және алдын алу шаралары қарастырылады. Буллинг - буллинг құрбандары үшін де, бұзақылардың өздері үшін де, эмоционалды және физикалық зорлық-зомбылықтың үнсіз куәгерлері үшін де ауыр зардаптарға әкелетін өте күрделі мәселе. Ересектер, ата-аналар мен мұғалімдер бұзақылықты балалар үшін табиғи деп санайтын, балалар "осылай ойнайды", ал ұлдар "әрқашан төбелеседі" деп ақтайтын. Қазіргі таңда, балалар мен жасөспірімдер арасындағы буллинг ақыры бұқаралық ақпарат құралдарының назарына ілікті, ал қоғамдық наразылық ата-аналарды, мұғалімдерді мен саясаткерлерді зорлық-зомбылыққа қарсы шаралар қабылдауға мәжбүр етеді.

**Кілт сөздер:** *жарақаттан кейінгі стресстік бұзылыс (ЖКСБ), құрбандар, бұзақылар, Дүниежүзілік денсаулық сақтау ұйымы.*

**Кіріспе:** Буллинг – бұл басқа адамға қайталанатын және ниетті түрде зиян келтіруді мақсат ететін агрессивті мінез-құлық. Ол үш негізгі түрге бөлінеді:

Физикалық буллинг: ұру, тебу, итеру, заттарды лақтыру сияқты физикалық зорлық-зомбылықты қамтиды. Физикалық буллинг тікелей физикалық жарақаттарға әкеліп қана қоймай, сонымен қатар терең психологиялық бұзылыс тудырып, ЖКСБ дамуына ықпал етеді. Тұрақты физикалық қауіп-қатер сезімі үрей мен ЖКСБ симптомдарының дамуына әкеледі [1].

Вербалды буллинг: мазақтау, қорлау, қорқыту, жала жабу сияқты сөзбен қорлауды қамтиды. Вербалды буллинг өзін-өзі бағалаудың төмендеуіне, депрессияға,

ұайышылдылыққа әкеледі. Қайталанатын сөзбен қорлау ЖКСБ-қа алып келуі мүмкін, өйткені бұл жеке тұлғаның бұзылуына және терең психологиялық жарақатқа әкеледі [2].

Кибербуллинг: интернет, ұялы телефондар немесе басқа технологиялар арқылы қорлауды қамтиды (мысалы, жағымсыз хабарлар жіберу, фотосуреттерді тарату, әлеуметтік желілерде қорлау). Осы түрлердің бірігуі де жиі кездеседі. Мысалы, бір баланы физикалық түрде ұрып, содан кейін оны әлеуметтік желілерде қорлайды. Кибербуллингтің ерекшелігі – оның анонимділігі және тұрақтылығы, бұл оның травматикалық әсерін күшейтеді. Қорлау 24/7 режимінде жалғасуы мүмкін, бұл ЖКСБ дамуына айтарлықтай ықпал етеді [3].

**Материалдар мен әдістер:** жарияланымдарды іздеу алгоритмі PubMed, Scopus, Google Scholar, e-Library электрондық кітапханасының дерекқорында индекстелген зерттеу тақырыбы бойынша әдеби көздерді іздеуді қамтиды. Талданған ғылыми мақалалардың жалпы көлемі 16-ті құрады.

**Негізгі бөлім:** Буллингтің кең таралғандығына байланысты дәл статистика жинау қиын, бірақ әлем бойынша жүргізілген зерттеулер оның кең таралғанын көрсетеді. Дүниежүзілік денсаулық сақтау ұйымының (ДДСҰ) мәліметтері: оқушылар арасында буллингтің кең таралуы туралы деректер ұсынылады, бірақ нақты сандар аймақтар мен елдер бойынша айтарлықтай өзгеруі мүмкін. Ұлттық және аймақтық зерттеулер: Көптеген елдерде буллинг туралы ұлттық зерттеулер жүргізілген, олар белгілі бір елдегі буллингтің деңгейін көрсетеді. Бұл зерттеулер әртүрлі демографиялық топтардағы буллингтің таралу жиілігін, буллингтің түрлерін және оның ұзақ мерзімді әсерлерін зерттейді [4]. Қазақстан бойынша деректер: Қазақстандағы оқушылар арасындағы буллинг туралы нақты статистиканы табу қиын, бірақ әлеуметтік зерттеулер мен мектептердегі сауалнамалар буллингтің бар екенін және оның мәселе екенін растайды. Нақты статистикалық деректер үшін Қазақстан Республикасы Білім және ғылым министрлігінің немесе басқа да тиісті ұйымдардың статистикалық мәліметтерін іздеу керек [5].

Шет ел зерттеушілерінің пікірінше, буллингке ұшырау көрсеткіштер мынадай:

1.АҚШ: американдық жасөспірімдердің шамамен 30% - ы буллингке тап болды және бұл көрсеткіш соңғы бірнеше жылда тұрақты болып қалды.

2.Ұлыбритания: Ұлыбританияда балалар мен жасөспірімдердің 50% - дан астамы буллинг жағдайлары туралы хабарлады, олардың себебі негізінен әлеуметтік медианы пайдалану болып табылады.

3.Австралия: австралиялық балалардың шамамен 35% - буллинг болды және бұл желіде қол жетімді мобильді құрылғылардың таралуына байланысты өсуде.

4.Жапония: Жапонияда мектеп оқушыларының шамамен 25% - ы буллингке тап болады және бұл білім беру ортасында үлкен проблемаға айналды [6].

Ал Қазақстандық зерттеулер бойынша статистика мынадай көрсеткіштерді көрсетті. Қазақстанда таралуы бойынша: ұлттық зерттеулердің деректері бойынша Қазақстандағы жасөспірімдердің 40% - дан астамы цифрлық буллингке ұшырады, бұл ретте бұл пайыз біртіндеп өсуде. Қорқыту және жеке ақпаратты жария ету - Қазақстандағы оқушылар арасында Цифрлық зорлық-зомбылықтың негізгі нысандары. Қазақстанда цифрлық буллинг құрбандарының шамамен 50% - ы психологиялық проблемаларды, соның ішінде депрессияны, мазасыздықты және өзін-өзі бағалаудың төмендеуін бастан кешіреді [7].

Буллинг – бұл травматикалық оқиға, өйткені ол қорқыныш, үрей және басқа да теріс эмоцияларды тудырады. Қайталанатын буллинг баланың психикасына ауыр салдар тигізіп, ЖКСБ дамуына әкелуі мүмкін. Буллингтің салдарынан дамиды ЖКСБ келесі белгілермен сипатталады:

1) Қайталанатын жағымсыз естеліктер: буллинг эпизодтарының қайталанатын естеліктері, түнгі түстер.

2) Травматикалық оқиғаны еске түсіретін жағдайлардан аулақ болу: буллингке байланысты адамдардан, жерлерден және жағдайлардан аулақ болу.

3) Гиперкозғыштық: ұйқының бұзылуы, шошыну, концентрацияның бұзылуы.

4) Теріс эмоциялар: қорқыныш, үрей, қайғы-қасірет, кінә сезімі. ЖКСБ буллингке ұшыраған балалардың өмір сапасын айтарлықтай төмендетіп, олардың әлеуметтік және академиялық өміріне әсер етеді [8].

Буллингтің өзінен басқа, ЖКСБ дамуына ықпал ететін басқа факторлар бар: буллингтің ұзақтығы және қарқындылығы: ұзақ уақыт бойы және жоғары қарқындылықпен жүретін буллинг ЖКСБ даму қаупін арттырады; қолдаудың болмауы: отбасы, достар немесе мұғалімдер тарапынан қолдаудың болмауы баланың жағдайын нашарлатады және ЖКСБ дамуына ықпал етеді; басқа травматикалық оқиғалар: егер бала басқа травматикалық оқиғаларды бастан кешірген болса, буллинг ЖКСБ дамуына қосымша ықпал етеді; жеке тұлғаның ерекшеліктері: кейбір балалар басқаларына қарағанда буллингке сезімтал болуы мүмкін; мектептің атмосферасы: агрессиялық атмосферасы бар мектептерде буллингтің алдын алу қиынға түседі. Кез келген адам буллингтен зардап шегуі мүмкін. "Жәбірленуші" терминін қолдану стигматизацияға және дәрменсіз позицияны нығайтуға әкеледі. Алайда, жәбірленушінің рөлдері мен сценарийлерін қабылдаған балалар буллингке жиі ұшырайды. Бұл ата-аналық сценарийді немесе алыс туыстарының немесе ата-бабаларының өмірлік сценарийлерін қабылдау болуы мүмкін [9]. Құрбандық және тағдырлы өмірлік сценарийлерді анықтау және олар бойынша жұмыс тек психотерапия процесінде мүмкін болады. Әдетте буллингке достар тобына кірмейтіндер қорқытуға бейім, өйткені олар әлсіз болып көрінеді. Жасөспірімдер топта болған кезде, басқа достар арасында олар әлсіз болып көрінбейді. Бұзақылардың мақсаттары көбінесе оқу мүмкіндігі шектеулі немесе ерекше қажеттіліктері бар балалар мен жасөспірімдер болып табылады. Мысалы, аутизммен ауыратын балаларда қорқыту қаупі жоғары болуы мүмкін. Олар сондай-ақ ерте балалық шақта агрессивті болуы мүмкін, бұл олардың құрдастарын одан бас тартуға немесе оларды оқшаулауға мәжбүр етеді [10].

Буллинг – бұл суицидтің маңызды қауіп факторы. Буллингке ұшыраған балаларда суицид туралы ойлар пайда болуы, суицидтік әрекеттер жасауы және өз-өзіне қол жұмсауы мүмкін. Буллингтің әсерінен балалар өзін жалғыз, қорғалмаған және үмітсіз сезінеді, бұл суицидтік ойлардың пайда болуына әкелуі мүмкін [11]. Суицидтің алдын алу үшін буллингті анықтап, онымен күресу өте маңызды. Балалардың үнемі буллингке ұшырауының ұзақ мерзімді психологиялық әсерлері оның травматикалық сипатымен тікелей байланысты. Бұл әсерлер кең ауқымды болуы мүмкін және баланың өмірінің барлық саласына, оның психикалық денсаулығынан бастап, әлеуметтік бейімделуіне және болашақтағы қарым-қатынастарына дейін әсер етеді [12].

Буллингтің ұзақ мерзімді әсерлерін бірнеше негізгі категорияларға бөлуге болады:

1) Психологиялық бұзылыстар: Буллинг ЖКСБ, депрессия, мазасыздық сияқты ауыр психикалық бұзылыстардың даму қаупін арттырады. Бұл бұзылыстар баланың өмірінің сапасын төмендетеді және ересек өмірінде де мәселелер тудыруы мүмкін. Тұрақты қорқыныш, үрей және жалғыздық сезімі баланың эмоциональды дамуына теріс әсер етеді.

2) Өзін-өзі бағалаудың төмендеуі: Үнемі буллинг баланың өзіне деген сенімін төмендетеді, өзін-өзі бағалауын нашарлатады және өзін-өзі күмәндандыруға әкеледі. Бұл өз кезегінде депрессияға, мазасыздыққа және басқа да психикалық мәселелерге ықпал етеді. Бала өзін жеткіліксіз, қабілетсіз және сүйіспеншілікке лайық емес сезінуі мүмкін.

3) Әлеуметтік бейімделудің қиындықтары: Буллингке ұшыраған балаларда әлеуметтік қарым-қатынасқа түсуде қиындықтар болуы мүмкін. Олар достар табуда, қарым-қатынасты орнатуда және сақтауда қиналады, сенімсіздік және басқаларға деген қорқыныш сезімі

басым болуы мүмкін. Бұл оқшаулануға, жалғыздыққа және әлеуметтік оқшаулануға әкеледі [13].

4) Оқу үлгерімінің төмендеуі: Буллинг баланың оқуына теріс әсер етеді. Үнемі қорқыныш және стресс концентрацияны нашарлатады, есте сақтау қабілетін төмендетеді және оқуға деген ынтасын жояды. Нәтижесінде оқу үлгерімі нашарлайды, академиялық жетістіктерге жету қиынға соғады.

5) Денсаулық мәселелері: Ұзақ мерзімді стресс физикалық денсаулыққа кері әсер етеді. Буллингке ұшыраған балаларда бас ауруы, асқазан-ішек жолдарының аурулары, ұйқының бұзылуы, иммунитеттің төмендеуі және басқа да соматикалық шағымдар жиі кездеседі [14].

6) Ересек өмірге әсері: Буллингтің ұзақ мерзімді әсерлері ересек өмірде де көрініс табуы мүмкін. Депрессия, мазасыздық, өзіне-өзі сенімсіздік және әлеуметтік бейімделудің қиындықтары жұмысқа орналасуда, қарым-қатынас орнатуда және отбасын құруда мәселелер тудыруы мүмкін [15].

Буллингтің алдын алу және онымен күресу үшін кешенді тәсіл қажет:

Мектептегі білім беру: Буллинг туралы білім беру бағдарламаларын енгізу және балаларды буллингтің түрлері, оның салдарлары және онымен күресу жолдары туралы ағарту.

Мектептегі саясат: Мектептерде буллингке қарсы нақты саясатты енгізу және оны қатаң орындау, буллингке ұшыраған балаларды қорғау және буллинг жасаған балаларды жазалау.

Қолдау көрсету: Буллингке ұшыраған балаларға психологиялық және әлеуметтік қолдау көрсету, оларға кәсіби көмек беру.

Отбасылық қолдау: Отбасыларға буллингтің алдын алу және онымен күресуде қолдау көрсету, балалармен ашық диалог жүргізу және олардың сезімдерін түсіну.

Қоғамдық сананы арттыру: Буллинг туралы қоғамдық сананы арттыру және онымен күресу бойынша халықты ағарту, буллингке қарсы жалпы ұстанымды қалыптастыру [16].

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# Occupational Safety and Health Monitoring for Medical Facility Employees: Risk Assessment and Preventive Measures Mechanisms

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**Abstract.** This article aims to discuss effective methods for ensuring occupational safety and monitoring the health of medical personnel, including risk assessment and the implementation of preventive measures. The study is based on an analysis of the working environment of medical staff, encompassing physical, chemical, biological, and psychosocial factors. It examines existing practices and approaches aimed at improving the safety of work processes for medical personnel. The article highlights the importance of regular health monitoring and its impact on the well-being of employees. The conclusion provides recommendations for enhancing risk assessment systems and fostering a culture of occupational safety. The findings of this research are significant not only for the management of medical institutions but also for improving occupational safety policies nationwide.

**Key words:** Laboratory Health and Safety, Biosafety, Biological threat, Chemical threat, Physical threat.

## Introduction

Currently, the study of occupational safety in the field of laboratory medicine is a new area of interest in Georgia, driven by the current state of the sector. It is crucial to refine the management methodology for occupational and health protection in laboratory medicine to safeguard employee health and reduce the risks associated with laboratory activities by creating a safe working environment.

Professional activities in the field of laboratory medicine are associated with physical, chemical, biological, and psychosocial risks. Enhancing mechanisms for protecting the safety and health of personnel plays a decisive role in ensuring occupational well-being.

The aim of this research is to identify key risk factors and assess their impact on the health of personnel employed in the field of laboratory medicine.

## Discussion

Laboratory work poses significant risks to employees, as workplaces often involve handling various patient samples containing numerous biological agents and toxins. Biohazards become even more pronounced in high-risk zones where manipulations are performed on pathogenic biological agents, whether for clinical or research purposes.

This article is based on a mixed research method incorporating both quantitative and qualitative analysis. Questionnaires were used for data collection, and the analysis considered international occupational safety standards and national regulations.

To ensure the safety of laboratory employees, medical institutions must implement continuous biosafety training programs. Laboratory personnel may face additional threats in various forms. Therefore, occupational safety training is essential.

Medical oversight aims to prioritize the safety and health of laboratory workers, which is achieved through preventive measures such as vaccination and health monitoring. Medical monitoring is vital for identifying the causes of illnesses or injuries and implementing preventive actions.

A medical supervision program should be developed and implemented at the institutional level. Its purpose is to identify and eliminate the causes of health deterioration. Additionally, regular medical screenings are crucial for early diagnosis and treatment.

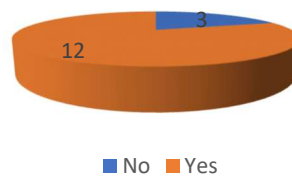
Pre-employment medical examinations are conducted for newly hired employees to assess their health status and determine whether any conditions exist that could increase the risk of harm while working in a laboratory.

Immunization is recommended for laboratory employees involved in research on infectious microorganisms, as laboratories are considered high-risk zones with a heightened probability of infection. For this reason, vaccination is a primary means of protecting employee health and is often a prerequisite for employment.

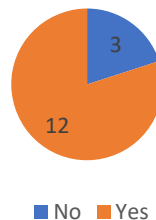
All health-related information about employees must remain confidential.

A study was conducted involving laboratory employees to address these issues. Specifically, employees from industrial and clinical microbiology, molecular diagnostics, clinical chemistry and immunology, and clinical diagnostic laboratories were surveyed. The results of the study are as follows:

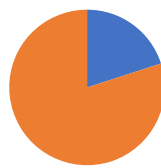
1. Is a pre-employment medical examination conducted for new (recently hired) employees before they start work?



2. Is periodic medical examination conducted for laboratory personnel?



## 3. Do you undergo the recommended immunization?



■ No ■ Yes

Psychological stress and emotional overload significantly reduce employee productivity. Therefore, it is important for medical institutions to have adequate support mechanisms for staff. There should be a continuous update of occupational safety regulations in accordance with international standards.

Identifying professional risks and implementing effective prevention mechanisms are essential for improving the working conditions of staff. The results of the study showed that improving occupational safety policies, including training and regular monitoring, ensures the protection of the health of employees working in the field of laboratory medicine.

### conclusion

The changes in the health status of laboratory staff should be a subject of study in medical centers. Employees are obligated, in case of symptoms that may be related to hazards present in the laboratory, to act according to established procedures and refer to the appropriate person. If necessary, proper medical intervention should be carried out, and records should be made.

It is also important for laboratories to have a health and safety management plan, which should include the identification of workplace hazards, risk management and assessment, the required competencies, training, and the documentation of health and safety system records.

Monitoring occupational safety and health status is essential for protecting the staff employed in medical institutions. The recommendations presented by the study will contribute to improving working conditions, ensuring employee well-being, and minimizing professional risks. This approach will have a significant impact not only on staff health but also on the quality of medical services.

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## Journalism

# Strategies for Engaging Students with Poetry Through Print and Non-Print Media

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### Abstract

This paper explores effective strategies for engaging students with poetry through print and non-print media. Recognising the educational value of poetry in fostering language development, cultural awareness, and emotional expression, the study outlines a dual approach that incorporates traditional textual resources, such as anthologies and poetry collections, alongside innovative digital formats like podcasts, videos, and social media. By examining the benefits and challenges of each medium, the paper highlights the potential for a blended learning environment that accommodates diverse learning styles and preferences. Practical applications and case studies demonstrate how educators can create dynamic and inclusive poetry experiences, ultimately aiming to enhance student engagement and understanding. The findings underscore the importance of integrating various media to foster a deeper appreciation for poetry in contemporary educational contexts.

**Keywords:** Poetry Education, Student Engagement, Print Media, Non-Print Media, Digital Learning, Literary Analysis, Multimedia Approaches, Creative Writing, Blended Learning,

### Introduction

Poetry has long been recognized as a powerful tool in education, providing a unique avenue for students to explore language, emotion, and culture. As a form of artistic expression, poetry invites students to engage with words in a way that can enhance their literacy skills, foster critical thinking, and promote an appreciation for the nuances of language. However, despite its inherent value, many students find traditional approaches to poetry daunting or disengaging, leading to a disconnect between their experiences and the rich possibilities that poetry can offer.

Recognizing the importance of engagement in learning, particularly in subjects that demand creativity and interpretation, educators must seek innovative strategies that resonate with students' diverse interests and learning styles. Engagement is not merely about participation; it involves forging meaningful connections that inspire curiosity and enthusiasm. When students actively participate in their learning process, they are more likely to find personal relevance in the material, leading to deeper understanding and lasting retention.

The purpose of this paper is to explore various strategies for engaging students with poetry through both print and non-print media. This study aims to provide educators with practical insights and tools for creating dynamic poetry experiences by examining the effectiveness of traditional texts alongside contemporary digital formats. The scope of the paper will encompass a review of relevant literature, a discussion of blended learning approaches, and case studies that illustrate the successful implementation of these strategies in classroom settings. Ultimately, this exploration seeks to demonstrate that, when thoughtfully integrated, diverse media can invigorate the study of poetry and cultivate a lifelong appreciation for this vital literary form.

### Engaging Students through Print Media

Engaging students in poetry education through print media involves utilizing traditional textual approaches that foster deep connections with the material. This chapter explores various

strategies, resources, and assignments that enhance students' interaction with poetry, cultivating a rich learning experience.

a) Traditional Textual Approaches

Traditional textual approaches to poetry education emphasize the importance of close reading and critical analysis. Educators can employ literary anthologies that provide curated selections of poets and movements, allowing students to explore diverse voices and styles. These anthologies serve as foundational texts, offering historical context and thematic relevance.

b) Literary Anthologies and Poetry Collections

Literary anthologies compile notable works from various poets, providing students with a broader understanding of poetic traditions. Poetry collections, which focus on specific poets or themes, allow for deeper exploration of an individual's unique voice and vision. Engaging students with these print resources encourages them to analyze the stylistic and thematic elements present in poetry.

c) Creative Assignments

Creative assignments, such as poetry writing workshops, can inspire students to express themselves through their own works. These workshops create a collaborative environment where students share their poetry, receive feedback, and refine their craft. Activities like illustrating poems can foster creativity by allowing students to visualize and interpret their chosen pieces through art.

d) Reading Strategies

Effective reading strategies are crucial for unlocking the depth of poetry. Close reading techniques help students engage deeply with the text, focusing on language, structure, and meaning. By encouraging students to annotate their texts, identify literary devices, and explore figurative language, educators can enhance their analytical skills.

e) Thematic Discussions

Thematic discussions provide a platform for students to connect personal experiences with poetic themes. Facilitating conversations around topics such as identity, love, and nature allows students to form connections with the text and each other. These discussions can be framed around specific poems, inviting students to share their interpretations and insights.

Engaging students through print media in poetry education involves a multifaceted approach that includes traditional textual methods, creative assignments, and strategic reading practices. By leveraging literary anthologies, poetry collections, and thematic discussions, educators can create a vibrant and engaging learning environment that fosters a deeper appreciation for poetry and its diverse expressions.

**Engaging Students through Non-Print Media**

In an increasingly digital world, poetry education is not confined to the pages of printed anthologies or collections. Non-print media has emerged as a powerful tool for engaging students, allowing them to interact with poetry in innovative and dynamic ways. This chapter will explore various non-print media forms, including digital poetry, online resources, multimedia presentations, and social media engagement. By utilizing these modern mediums, educators can enhance students' understanding of poetry, making it more accessible and relevant to their lives.

a) Digital Poetry Forms

Digital poetry encompasses a vast array of creative expressions that leverage technology to create interactive and engaging poetic experiences. Forms such as interactive poetry websites, poetry games, and hypertext poetry allow students to engage with text in ways that are non-linear and non-traditional. As students navigate these digital spaces, they can explore multiple meanings, experiment with structure, and interact with poetry in a manner that stimulates their creativity and critical thinking.

For example, websites that feature interactive poetry allow users to rearrange lines, combine fragments from different poems, or create new works from existing texts. This interactivity encourages students to think about poetry as a living, evolving form, rather than a static artifact. Exploring digital poetry can lead to discussions about the future of the genre and how technology influences literary expression.

b) E-Books and Online Poetry Collections

E-books and online poetry collections offer students unprecedented access to a wealth of poetic works from a diverse range of authors and cultures. Digital platforms can host entire anthologies or individual collections, making it easier for students to discover new poets and explore different themes. Many online resources also include author biographies, critical essays, and links to related works, enhancing students' context for understanding poetry.

Educators can guide students through the process of exploring e-books and online collections. Assignments may include comparing poems from different cultures or time periods, analyzing how form shifts in digital formats, or creating digital annotations for selected texts. Using technology in this manner can transform the learning environment, making poetry studies more flexible and engaging.

c) Poetry Podcasts and Audiobooks

The rise of podcasts and audiobooks has transformed the way poetry can be experienced and appreciated. Poetry podcasts present a unique platform for poets to read their own work, discuss their inspirations, and engage in conversations about craft. Students can listen to contemporary poets and gain insights into their creative processes, which is often not accessible through print alone.

Additionally, poetry audiobooks provide students with the opportunity to experience the musicality and rhythm of poems through spoken word. Audio interpretations can illuminate nuances in language and voice that may not be as apparent on paper. Teachers might assign specific podcasts or audiobooks for group discussions or reflections, integrating auditory experiences into the study of poetry.

d) Multimedia Approaches

Multimedia approaches to poetry engage students on multiple sensory levels, combining visual, auditory, and textual elements. Projects that integrate poetry with film, music, or visual art encourage students to think critically about how different media interact and enhance meaning in poetic expression.

For instance, students might create poetry videos that pair their original poems with images, animations, or music. These projects demand that students consider how elements such as imagery, sound, and pacing can amplify the emotional impact of their words. The act of curating visuals and sounds to accompany their poetry fosters a deeper understanding of their artistic intentions and the multifaceted nature of poetic expression.

e) Poetry Videos and Short Films

Poetry videos and short films serve as powerful mediums for visual storytelling that complements poetic texts. Engaging with these forms allows students to explore the intersection of poetry and visual arts, encouraging them to express their interpretations creatively.

For assignments, students can be tasked with creating short films based on a poem or a theme explored in class. This might involve screenplay writing, directing, and collaborating on production elements. By translating a poem into a visual narrative, students gain insight into poetic devices and thematic explorations, enhancing their analytical skills.

f) Visual Poetry and Multimedia Presentations

Visual poetry takes traditional poetic forms and infuses them with visual elements, often blurring the lines between text and image. Students can experiment with shaping their poems into

visual artwork or using design software to combine text and imagery creatively. This approach invites exploration into how layout, typography, and color can affect the reading experience.

Multimedia presentations can further enhance this exploration by incorporating sound, video, and text into a cohesive performance. Students can create presentations that analyze visual poetry's impact on meaning while connecting their creative projects to broader themes discussed in class. This form of engagement deepens their understanding of poetic language as well as their ability to convey complex ideas through multiple formats.

#### g) Interactive Platforms

Interactive platforms provide avenues for students to engage collaboratively with poetry and connect with other learners. Websites that focus on collaborative poetry writing or virtual workshops allow students to share their work, provide feedback, and engage in discussions with peers beyond the classroom.

For instance, platforms like Wattpad or poetry-focused forums enable users to publish their poetry and receive reactions from wider audiences. Educators can facilitate usage of these platforms in structured assignments, where students draw inspiration from their interactions and create new works based on peer feedback.

#### h) Social Media Engagement (e.g., Instagram Poetry)

Social media has transformed the dissemination and appreciation of poetry, particularly through platforms like Instagram and TikTok. These platforms allow poets to share bite-sized verses, often accompanied by eye-catching visuals. The accessibility of social media poetry can inspire students to explore their poetic voices in an informal and engaging way.

Teachers can encourage students to create their own poetry posts, connecting them to larger discussions about audience, visibility, and the role of social media in contemporary poetry. Exploring this medium allows students to consider how poetry can take on new forms while still maintaining its core elements. It highlights the evolving nature of poetry and its ability to resonate with digital native audiences.

#### i) Poetry Apps and Websites

Various apps and websites dedicated to poetry offer additional resources for students, ranging from writing prompts to instructional videos. These digital tools can provide students with regular engagement with poetry outside of the classroom, cultivating a routine practice of reading and writing.

Apps such as Poetizer and Poetizer Pro allow users to connect with fellow poets, share their work, and explore poetic styles. Teachers can incorporate these resources into curriculum by assigning virtual writing exercises or creating competitions that encourage students to upload their work to these platforms.

Engaging students through non-print media offers exciting opportunities for exploring the vast landscape of poetry. By harnessing digital forms, audio experiences, multimedia projects, and social media platforms, educators can make poetry more accessible and relevant to today's learners. These innovative methods foster creativity, collaboration, and critical thinking, igniting a passion for poetry that transcends the boundaries of traditional print media. Ultimately, incorporating non-print media into poetry education enriches students' literary experiences and opens their eyes to the ever-evolving nature of poetic expression in a digital world.

### **Integrating Print and Non-Print Media**

In an era where the boundaries between print and digital media are increasingly blurred, integrating these two modalities in poetry education can create a richer and more dynamic learning environment. By leveraging both print and non-print resources, educators can tailor their teaching methods to meet diverse student needs and preferences. This section will explore blended learning approaches, the combination of textual and digital resources, various projects that integrate both formats, and the benefits of creating an inclusive, differentiated classroom.

### Blended Learning Approaches

Blended learning combines traditional face-to-face instruction with online learning experiences, creating a flexible and engaging environment for students. In poetry education, this approach allows students to explore and understand texts through simultaneous exposure to both print and digital formats. For example, teachers can assign students to read a poem from a print anthology while simultaneously accessing multimedia analyses online.

Through this format, students have the opportunity to discuss their readings in class and reflect on additional resources outside the classroom—such as podcasts, videos, or interactive digital poetry. This blend fosters a comprehensive understanding of poetic works, as students can engage with diverse interpretations and contemporary voices from multiple sources.

### Combining Textual and Digital Resources

Combining textual and digital resources enhances students' learning experiences and allows them to approach poetry from different angles. Teachers can curate live readings of poets reciting their work alongside the print version in class, creating a multidimensional exposure that can be particularly engaging.

Incorporating e-books and online articles that provide context can also enrich students' appreciation of the poetry being studied. By organizing lessons around a poem or poet, educators can encourage students to explore both traditional analyses and contemporary discussions, reflecting the multifaceted nature of poetry.

### Projects that Incorporate Both Media

Projects that integrate print and non-print media can foster creativity and deeper engagement with poetry. For instance, students can create multimedia poetry portfolios that include printed poems, their analytical reflections, and digital components like videos, audio recordings, or interactive digital artwork.

Another potential project is to have students pair up to write a poetry analysis essay using print resources, as well as a corresponding video presentation that synthesizes their findings visually and audibly. By bridging these two media, students not only develop analytical skills but also enhance their technological literacy.

### Creating a Diverse Learning Environment

Integrating both print and non-print media can be a powerful means of fostering a diverse learning environment. Students have varying preferences for how they engage with material, and using multiple formats allows them to choose the mediums that resonate most with them.

For instance, visual learners might excel with projects that allow them to illustrate their understanding of poetry through digital media, while auditory learners might benefit from listening to poetic readings or creating spoken word pieces. This inclusiveness can boost motivation and engagement in the classroom.

### Differentiated Instruction and Student Choices

Differentiated instruction is essential for meeting the varied learning needs within a classroom. Integrating print and non-print media provides multiple options for students to engage with poetry on their terms.

Teachers can present students with choice assignments that allow them to select how they want to analyze a poem. Some might choose to write a traditional essay based on print sources, while others might create a digital presentation featuring video interpretations and visual analyses. Such flexibility can increase student investment in the content and promote agency in their learning.

### Collaborative Learning Opportunities

Integrating print and non-print media also opens doors for collaborative learning opportunities. Students can work together in small groups to create a digital anthology that combines their favorite printed poems with their interpretations or multimedia responses.

By engaging in peer discussions and collaborative projects, students not only deepen their understanding of poetry but also develop essential skills such as communication, collaboration, and critical thinking. This social aspect of learning can be particularly instrumental in a poetry classroom where interpretation and discussion are key.

#### Group Projects and Peer Review

Group projects that require students to combine print and non-print resources can serve as excellent tools for peer review and feedback. For example, students might work in teams to create a digital poetry zine that includes printed poems, original works, and multimedia responses.

Following the completion of the projects, incorporating a peer review phase allows students to share insights and constructive feedback with one another. This collaborative process not only develops students' analytical abilities but also fosters a supportive classroom community where individuals feel valued and heard.

Integrating print and non-print media in poetry education offers a wide range of opportunities for enriching student engagement and learning. Through blended learning approaches, diverse projects, and differentiated instruction, educators can create dynamic and inclusive environments where all students can thrive. As poetry continues to evolve in a digital age, adopting these integrative strategies prepares learners to navigate and appreciate the complexities of poetic expression in various forms, ultimately fostering a lifelong passion for literature.

#### Conclusion

In the exploration of engaging students through both print and non-print media in poetry education, we have highlighted a range of effective strategies that can foster a deeper appreciation and understanding of the poetic form. The incorporation of traditional textual approaches, such as literary anthologies and creative assignments, sets a solid foundation for students as they delve into the richness of poetry. Activities like poetry writing workshops and thematic discussions create vibrant classroom environments where students can connect personally and creatively with texts, enhancing their analytical and expressive skills.

Equally important is the integration of non-print media, which introduces contemporary forms of engagement that resonate with students in today's digital landscape. Digital poetry, e-books, podcasts, and multimedia approaches broaden the horizons of poetic expression, allowing students to experience poetry in diverse formats. Leveraging platforms like social media and interactive poetry apps empowers students to share their voices and explore the community aspect of poetry in innovative ways.

The chapter also emphasizes the importance of a blended learning approach that combines print and non-print media. By implementing differentiated instruction and collaborative projects, educators can cater to varied learning styles and preferences, creating an inclusive and dynamic learning environment.

Overall, integrating diverse media enriches the poetry education experience, promoting student engagement and fostering a lifelong love for literature. By equipping students with both traditional and modern tools, educators can prepare them to navigate and appreciate the complexities and joys of poetry in all its forms.

Educators should also consider the diverse cultural backgrounds and preferences of their students when curating reading materials. Identifying a range of voices—both classic and contemporary—from various traditions can create a richer literary experience.

Integrating print and non-print media into poetry education comes with its own set of challenges and considerations. By addressing student resistance, balancing traditional and modern

approaches, and developing effective assessment strategies, educators can create a comprehensive and engaging learning experience. Embracing these challenges not only enriches poetry education but also prepares students to navigate the complexities of contemporary literary forms, contributing to their growth as both readers and creators.

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# Investigating Trends and Research on the Influence of Media in Contemporary Poetry

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## Abstract

This article, Investigating Trends and Research on the Influence of Media in Contemporary Poetry, delves into the dynamic interplay between modern media and poetic expression, focusing on several significant themes that have emerged in recent years. Beginning with an overview of Flarf Poetry, the article explores this avant-garde movement, characterized by its embrace of language from the internet and everyday life, which challenges traditional poetic forms and expands the boundaries of poetic practice. The discussion then shifts to the healing potential of poetry, highlighting how contemporary poets leverage media platforms to create spaces for reflection, resilience, and emotional healing in a fast-paced digital world. Additionally, the impact of personal narratives is examined, illustrating how poets draw from lived experiences and social media to construct authentic voices that resonate with diverse audiences. Finally, the article addresses the rise of visual poetry, where text and imagery converge, reflecting the multifaceted nature of modern communication and aesthetics. Through this comprehensive analysis, the article demonstrates how contemporary poetry is not only a reflection of societal changes but also a vital medium for processing experiences and fostering connections in an increasingly interconnected world.

**Keywords:** Contemporary Poetry, Micro poetry, Flarf Poetry, Avant-Garde Movement, Media Influence, Healing Poetry, Personal Narratives, Visual Poetry, Digital Communication, Artistic Expression, Poetic Practice.

## Introduction

The intersection of media and poetry has undergone significant transformation in the digital age, reshaping how poetry is created, distributed, and consumed. As technological advancements continue to proliferate, contemporary poetry has increasingly found a home across various media platforms, allowing poets to bypass traditional publishing routes in favour of direct engagement with audiences. This shift not only democratizes access to poetic works but also influences the thematic and stylistic content of poetry itself, reflecting broader societal changes and cultural dialogues.

Research has indicated that the advent of digital platforms—ranging from social media to blogging sites—has given rise to new forms of poetic expression, including micro-poetry and multimedia poetry. These innovations challenge conventional notions of what poetry can be, prompting scholars to explore how the aesthetic and performative dimensions of poetry adapt in response to the demands of digital media. In parallel, the proliferation of spoken word performances and poetry slams has revitalized interest in poetry as a live art form, highlighting the interactive role of audience participation in shaping poetic narratives.

Furthermore, contemporary poets increasingly engage with pressing social and political issues, utilizing media as a powerful tool for advocacy and connection. Through platforms such as Instagram and Twitter, poets can harness the speed and reach of digital communication to explore

themes related to identity, justice, and mental health, fostering a sense of community among diverse voices.

This paper aims to investigate the current trends and research surrounding the influence of media on contemporary poetry. By examining the implications of digital technology, performance dynamics, and community engagement, we seek to contribute to a deeper understanding of how media continues to transform poetic practices. In doing so, this study will underscore the relevance of poetry as a vital form of expression and a means of navigating the complexities of modern life.

Research and trends in the influence of media on poetry encompass a variety of themes, mediums, and contexts, reflecting the evolving relationship between poetry and contemporary modes of communication. Here are some key areas of focus:

#### Rise of Digital Platforms and Accessibility

The rise of digital platforms, including social media and blogging sites, has democratized poetry, allowing poets to reach wider audiences without the need for traditional publishing. Platforms like Instagram (often referred to as Instagram poetry), Tumblr, and Twitter have enabled poets to share their work instantly and connect with readers globally. This trend has led to the emergence of micro-poetry and visual poetry, where the formatting and presentation of text are as significant as the language itself.

#### Attributes of Micropoetry

Micro-poetry refers to a succinct form of poetry that usually consists of very brief pieces, often just a few lines or even a single sentence. This genre embraces brevity and precision, aiming to convey profound emotions or thoughts in a compact format. Micro-poetry has gained popularity primarily through social media platforms, particularly Twitter and Instagram, where character limits or visual representation encourage the creation of concise works. This format aligns well with the fast-paced nature of digital communication, allowing for immediate interaction and sharing among readers.

Micro-poetry often employs techniques such as imagery, metaphor, and wordplay to create an emotional impact despite its brevity. Poets who engage with this form generally aim to evoke strong feelings or reflections in readers, often focusing on personal experiences, observations, or universal themes. Notable examples of micro-poetry can be found in hashtags like `#micropoetry` or `#twitpoem`, and celebrated poets like Rupi Kaur and Atticus Poetry have successfully leveraged this style to reach large audiences.

Micropoetry constitutes a distinct genre of poetic expression, encompassing forms such as tweetku (alternatively known as twihaiku, twaiku, or Twitter poetry) and CAPTCHA poetry, the latter of which derives its textual content from responses generated through CAPTCHA anti-spamming software. The term `micropoem` may have been first utilized by novelist W. G. Sebald, who described the poems in his 2004 work, *Unrecounted*, which typically comprised approximately twenty words. The contemporary usage of `micropoetry` to designate works of 140 characters or fewer appears to have originated independently as a portmanteau combining `microblogging` and `poetry`, first noted in a communication on the microblogging platform *Identica* on January 23, 2009, which announced the establishment of a group for poetry enthusiasts on that service. (Bonta.2010) A subsequent communication from the same platform provided an example of micropoetry authored by another user, characterized by its lyrical qualities yet lacking alignment with any established poetic forms such as haiku or tanka.

Although brevity in poetry is most associated with the traditional haiku, the advent of microblogging platforms in the 21st century fostered a new environment conducive to epigrammatic verse. One of the earliest proponents of micropoetry was the daily haiku journal *tinywords*, which began publishing brief haiku via short message service in the year 2000.[3]

Micro-poetry frequently exhibits affinities with the concept of found poetry, wherein a poetic aesthetic is discerned within texts not initially intended as poetic. A notable early instance of this phenomenon was the Twitter feed of former Alaskan Governor Sarah Palin, which was humorously appropriated as poetic material by comedian Conan O'Brien and actor William Shatner.[5] This interplay between conventional texts and poetic interpretation highlights the evolving boundaries of poetic discourse in the digital age

#### Visual Poetry

Visual poetry is an art form that combines poetry and visual elements to enhance its meaning and impact. This genre encompasses a broad range of styles, from typographical experimentation where the layout and arrangement of the text contribute to the poetic message, to the incorporation of images, colours, and graphic designs. Visual poetry invites readers to engage with the text not only through its linguistic content but also through its visual representation, creating a multi-sensory experience.

The origins of visual poetry can be traced back to movements such as concrete poetry, where the physical shape and appearance of the poem played a vital role in its interpretation. Contemporary visual poetry often emerges in digital formats, making use of tools such as graphic design software and social media. Poets may create digital collages or gifs that incorporate text within images, blurring the boundaries between literary and visual art. This interdisciplinary approach allows poets to explore themes in innovative ways and reach broader audiences who are more accustomed to visual storytelling in the digital age.

Micro-poetry and visual poetry exemplify the evolving landscape of contemporary poetry shaped by modern media. Micro-poetry emphasizes brevity and immediacy, while visual poetry harnesses a fusion of text and imagery to create rich, multi-dimensional experiences for readers. Together, these forms highlight the adaptability of poetry in a rapidly changing cultural environment.

#### Flarf Poetry within Avant-Garde Movement

Flarf poetry represents an avant-garde movement within the domain of contemporary poetry, emerging in the early 21st century. The nomenclature 'flarf' was introduced by poet Gary Sullivan, who is recognized for producing and disseminating some of the earliest examples of Flarf poetry. The initial practitioners of this movement operated in a loosely aligned collaborative framework through an email mailing list, adopting a methodological approach that explicitly repudiated traditional standards of literary quality. These poets frequently engaged with subject matter and tonalities that are typically deemed inappropriate or unconventional within the poetic canon.

A central methodological innovation of the Flarf movement, developed by poet Drew Gardner, involved the utilization of unconventional search terms to mine Internet content, subsequently synthesizing the retrieved results into humorous or unsettling poetic works, plays, and related texts.(Fischer. 2009)

Notable figures who contributed to the advancement of the Flarf movement include Jordan Davis, Katie Degentesh, Drew Gardner, Nada Gordon, Mitch Highfill, Rodney Koeneke, Michael Magee, Sharon Mesmer, Mel Nichols, Katie F-S, K. Silem Mohammad, Rod Smith, Gary Sullivan, and several others. Together, these poets have significantly redefined the parameters of poetic expression by embracing the absurd and the unconventional, thereby challenging the established norms of literary production and reception.

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### Spam Poetry: An Exploration of Digital Absurdity and Surrealism

Spam poetry, a subgenre that emerged in the wake of the internet age, uniquely intersects the realms of modern technology, language, and artistic expression. It consists of poetry crafted from unsolicited and often nonsensical messages that inundate users' email inboxes, chat rooms, and social media platforms. Spam poetry exploits the inherent absurdities of commercial, automated, and spam communications, transforming the mundane or intrusive messages of the digital landscape into art. This chapter explores the origins, methodologies, and implications of spam poetry, situating it within the broader context of contemporary poetics and cultural commentary.

Spam poetry can trace its origins to various avant-garde movements, including Dadaism and Futurism, that sought to challenge conventional artistic norms and the boundaries of language. Early 20th-century Dadaists celebrated randomness and absurdity, often employing cut-up techniques, collage, and chance operations to create art that subverted established meanings. Similarly, spam poetry utilizes the erratic and often illogical nature of spam messages to generate unexpected combinations of words, phrases, and imagery.

The rise of digital communication in the late 20th and early 21st centuries laid the groundwork for spam poetry's development. As people increasingly transitioned their interactions from physical to digital spaces, the phenomenon of unwanted emails and automated messages proliferated. The term *spam*, coined in reference to the ubiquitous canned meat product featured in a Monty Python sketch, aptly captures the essence of unsolicited communication—ubiquitous, often low-quality, and sometimes absurd. Poets began to recognize the potential of these disregarded messages as a rich source of material for poetic exploration.

### Methodologies of Spam Poetry

The creation of spam poetry typically involves appropriating and recontextualizing text extracted from spam emails, advertisements, and other unsolicited communications. Poets may cut and splice these texts, manipulating them into coherent or intentionally incoherent poetic forms. The process often embraces randomness, allowing the peculiarities of the source material to dictate the structure and themes of the poems.

Common techniques employed in spam poetry include:

1. **Cut-Up and Collage** : Following in the footsteps of Dadaists like William S. Burroughs, poets dissect spam messages and reassemble their fragments. This method creates disjointed yet intriguing associations that challenge conventional syntax and semantics.

2. **Surreal Juxtaposition** : The inherent absurdity of spam messages allows poets to juxtapose incongruous ideas and imagery, producing poetic results that can be both humorous and unsettling. Such contrasts evoke a sense of surrealism, as the texts often reflect a disconnection from reality.

3. **Erasure and Redaction** : Some spam poets employ erasure techniques, removing selected words and lines while retaining significant fragments to create new meanings. This method highlights the latent poetry present within mundane or commercial language.

4. **Stream of Consciousness** : Some spam poetry adopts a stream-of-consciousness approach, preserving the erratic flow of thought and language found in spam messages. This technique evokes a sense of urgency and spontaneity, mirroring the chaotic nature of digital interactions.

5. **Visual Poetry** : Spam poetry can also manifest as visual or concrete poetry, where the arrangement of text itself forms shapes or patterns that complement the content. This visual element underscores the materiality of language in the digital format and prompts readers to engage with the text beyond its linguistic meaning.

#### Themes and Cultural Commentary

Spam poetry engages with several themes, reflecting the complexities of contemporary society and the digital age. Some of the prominent themes found in spam poetry include:

1. **Consumer Culture** : Many spam messages are advertisements for products, services, or dubious schemes, prompting poets to critique rampant consumerism. By transforming these messages into poetry, spam poets can spotlight the absurdity of the consumerist mindset and the often exploitative nature of advertising.

2. **Isolation and Connectivity** : Spam poetry emerges from a paradoxical context where digital communication simultaneously fosters global connectivity and can lead to feelings of isolation. The deluge of unsolicited messages creates a sense of overwhelm, prompting poets to reflect on the complexities of human interaction in the digital realm.

3. **Surveillance and Data Privacy** : The prevalence of spam emails often raises concerns about the commodification of personal data. Spam poetry critiques the intrusive nature of targeted advertising and the surveillance capitalism that underpins much of the digital economy, inviting readers to question the implications of their online presence.

4. **Absurdity and Meaning** : At its core, spam poetry embodies a celebration of absurdity. By engaging with the nonsensical nature of spam communications, poets explore the fluidity of meaning in language and the ways in which context shapes interpretation. The resulting works challenge readers to reconsider their established notions of poetry and meaning.

Spam poetry offers a distinctive lens through which to examine the intersections of language, technology, and culture in the digital age. By transforming the detritus of unsolicited communications into poetic works, spam poets challenge conventional notions of artistry and authorship while simultaneously engaging with pressing societal themes. The genre embodies a celebration of absurdity and creativity, prompting readers to reconsider the potential for poetry to emerge from even the most banal and intrusive aspects of modern life. As the digital landscape continues to evolve, spam poetry remains a vital and thought-provoking form of artistic expression, inviting both creators and audiences to navigate the complexities of language and meaning in an increasingly interconnected world.

#### Artificial Intelligence and Poetry Generation

The exploration of artificial intelligence (AI) in creating poetry represents a fascinating trend. AI programs that generate poetry challenge traditional notions of authorship and creativity, prompting discussions about the future of poetry as both human expression and technological innovation.

### Emotional Resonance and Mental Health

Research into the emotional impact of poetry consumption, particularly through media, highlights poetry's role in mental health. The rise of healing poetry and the practice of sharing personal experiences through poetic forms underscores poetry's therapeutic potential in addressing trauma and fostering community support.

Research into the emotional impact of poetry consumption, particularly through media, highlights poetry's profound role in mental health. The rise of healing poetry and the practice of sharing personal experiences through poetic forms underscores poetry's therapeutic potential in addressing trauma and fostering community support.

### The Therapeutic Potential of Poetry

The therapeutic potential of poetry has long intrigued psychologists, educators, and mental health professionals. Engaging with poetry allows individuals to articulate feelings and experiences that often feel inexpressible. For those grappling with mental health issues, the act of reading or writing poetry can be a powerful means of processing emotions. The structured yet expressive nature of poetic language often resonates with individuals who may find more straightforward forms of expression inadequate.

1. **Articulating the Inexpressible** : Mental health challenges can often make it difficult for individuals to find language for their feelings. Poetry provides a unique linguistic medium that grants users a myriad of ways to convey their inner worlds. The use of metaphor, imagery, and rhythm can encapsulate complex emotional experiences, allowing readers and writers to express nuanced feelings of sadness, anger, joy, and hope.

2. **Catalyst for Reflection** : Poetry often serves as a mirror, prompting readers or writers to reflect on their own experiences. The process of engaging with a poem can inspire introspection, prompting individuals to consider their emotional states and the experiences that shape them. This reflective practice can facilitate a deeper understanding of one's mental health, leading to personal growth and healing.

3. **Creating Connections** : The act of sharing poetry can foster community and create connection among individuals facing similar struggles. Platforms such as social media, poetry readings, and workshops have emerged as spaces for the exchange of poetic expressions focused on mental health, trauma, and recovery. When individuals share their stories through poetry, they may find solidarity in others' experiences, thus reducing feelings of isolation. This sense of community is vital for mental health, as it encourages collective healing and support.

### Healing Poetry in Modern Practices

The contemporary landscape of poetry includes a growing emphasis on healing poetry, a genre that specifically seeks to address mental health issues and emotional wellness. This movement is reflective of a broader cultural acknowledgment of mental health challenges and the importance of emotional well-being.

1. **Social Media and Accessible Platforms** : Social media platforms, such as Instagram and TikTok, have democratized the sharing of poetry, allowing poets with lived experiences to reach wide audiences. The hashtag `MentalHealth` or `HealingPoetry` often accompanies such works, creating online communities where users can connect over shared experiences. The accessibility of these platforms enables diverse voices to emerge, providing a sense of representation and understanding to people struggling with their mental health.

2. **Workshops and Poetry Therapy** : Various mental health practitioners employ poetry therapy as part of their treatment strategies. Workshops that focus on writing and reading poetry can be therapeutic spaces where individuals explore their feelings in a safe environment. Trained facilitators guide participants through the poetic process, encouraging them to use creativity as a means of coping and self-discovery.

3. Institutional Support : Educational and mental health institutions have increasingly recognized the benefits of poetry in therapy. Programs that incorporate poetry into their curricula or therapeutic practices help to normalize discussions around mental health. By fostering environments where poetry is valued, institutions encourage individuals to embrace their inner voices and emotional complexities.

#### The Impact of Personal Narratives

Personal narratives expressed through poetry often resonate deeply with readers, as individuals find solace and validation in familiar themes of struggle and resilience. This connection between poet and audience can be profoundly healing.

1. Empowerment Through Vulnerability : Writing about personal trauma can empower poets by reclaiming their narratives. The act of storytelling through poetry allows individuals to assert their identities, transforming pain into art. This process can serve as a catalyst for healing, enabling poets to navigate their circumstances with newfound agency.

2. Facilitating Conversation : Poetry that addresses themes of mental health opens the door for crucial conversations. It can normalize discussions around issues such as depression, anxiety, and grief, helping to dismantle stigmas surrounding mental health. Readers who encounter these themes in poetry may feel inspired to share their own stories or seek help, thus contributing to a cultural shift toward recognizing and addressing mental health challenges.

3. Resilience and Hope : Many poets find solace in using their art to express the journey from despair to hope. This transformation is a common thread in healing poetry, which often culminates in themes of resilience, growth, and the possibility of recovery. Such narratives reinforce the idea that healing is a journey shaped by both struggle and triumph, offering a beacon of hope to those in similar situations.

#### Conclusion

The emotional resonance of poetry as a therapeutic medium illustrates its profound potential to enhance mental health and foster community. As poetry continues to evolve within digital and communal spaces, it remains an essential instrument for addressing emotional struggles, sharing personal narratives, and creating connections. In a world increasingly acknowledging the importance of mental health, the role of poetry as a vehicle for healing and understanding is more vital than ever. By embracing poetry's capacity for articulation, reflection, and connection, individuals can navigate their emotional landscapes and contribute to broader conversations about mental health in an empathetic and meaningful way.

The therapeutic potential of poetry serves to illuminate its profound capacity for emotional resonance and mental health support. As poetry continues to evolve within both digital and communal spaces, it remains a vital instrument for addressing emotional struggles, sharing personal narratives, and creating connections. In a world increasingly recognizing the importance of mental health, poetry's role as a vehicle for healing and understanding is more crucial than ever. By embracing poetry's capacity for articulation, reflection, and community building, individuals can navigate their emotional landscapes and contribute to broader conversations about mental health in empathetic and meaningful ways.

#### Conclusion

The intertwining of media and contemporary poetry has ushered in a transformative era, redefining how poetry is created, consumed, and understood. As we have explored throughout this article, the influence of various media—ranging from social platforms to traditional publications—has democratized access to poetry, allowing diverse voices and narratives to flourish. The convergence of technology and art has not only broadened the audience for poetry but also enhanced its capacity to foster therapeutic engagement and community dialogue.

One of the most significant trends highlighted is the emergence of healing poetry, which serves as a powerful tool for individuals grappling with mental health challenges. The accessibility of platforms such as Instagram and TikTok has created spaces where poets can share their stories and lyrical expressions, resonating deeply with audiences seeking connection and understanding. This movement reflects a larger cultural shift towards recognizing the importance of mental health and emotional well-being, affirming poetry's role as a means of catharsis and reflection.

Research has underscored the therapeutic potential of poetry, revealing how engagement with poetic forms can facilitate introspection, articulate the inexpressible, and build community. The personal narratives shared through poetry enable individuals to reclaim their experiences and foster connections with others who have faced similar struggles. This shared space not only reduces feelings of isolation but also promotes resilience and hope, reinforcing poetry's ability to heal.

Moreover, the role of poetry in contemporary media challenges traditional notions of authorship and consumption. By encouraging collaborative creation and dialogue, modern media platforms invite new ways of thinking about poetic expression. This shift not only allows for a greater diversity of voices but also invites audiences to become active participants in the poetic dialogue, shaping the way poetry is interpreted and appreciated.

As we navigate this evolving landscape, it becomes clear that the study of trends and research on the media's influence in poetry will continue to uncover rich insights into the art form's relevance in contemporary society. Poetry's ability to resonate emotionally, address mental health, and foster community connection positions it as a vital component of cultural discourse. The ongoing exploration of these themes will deepen our understanding of poetry's impact, ensuring its continued evolution and significance in an ever-changing world. Ultimately, the dynamic relationship between media and poetry not only enriches the art form but also offers profound pathways for healing, expression, and connection in the lives of individuals and communities alike.

The interplay between media and poetry continues to evolve, driven by technological advancements and cultural shifts. As poets adapt to these changes, new forms and expressions of poetry emerge, reflecting the changing landscape of communication and artistic expression. Researchers are increasingly focused on how these trends influence not only the production and dissemination of poetry but also its engagement with readers and communities.

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