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Description Of The Mechanism Of Vasoreleaxant Effect Of Galic Acid Derivatives On The Contractoral Activity Of The Aortic Smooth Muscle

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Abstract
In this study, the antioxidative stress effects of gallic acid derivatives — ursodeoxycholic acid (UDCA) and taurocholic acid (TCA) — were studied in rat aortic smooth muscle. As an experimental model, UDCA and TCA were added to aortic segments under phenylephrine-induced contraction, and their vasorelaxant properties and antioxidant mechanisms were evaluated. The results of the study showed that these substances significantly reduce ROS levels, enhance vascular relaxation, and that these effects are mediated by NO synthesis or calcium ion influx. In particular, the analysis of ROS levels using DHE confirmed the cytoprotective activity of these derivatives. These results substantiate the therapeutic potential of gallic acid derivatives in the cardiovascular system.
Keywords: gallic acid derivatives, UDCA, TCA, oxidative stress, antioxidant activity, vasorelaxation, nitric oxide (NO), rat aorta, smooth muscle, ROS, cytoprotection.

Introduction

The cardiovascular system (CVS) plays a central role in maintaining homeostasis in humans and animals. This system ensures the normalization of cardiac activity, blood circulation, peripheral resistance and blood pressure, and is involved in the delivery of oxygen, nutrients and hormones to all tissues and organs of the body. Therefore, disorders in the functioning of the CVS cause a wide range of physiopathological conditions, in particular, diseases such as arterial hypertension, atherosclerosis, ischemic heart disease, stroke and heart failure.

According to the World Health Organization (WHO), cardiovascular diseases (CVD) cause more than 17 million deaths each year, and this indicator is the leading cause of global mortality. In particular, hypertension (high blood pressure) is one of the most important risk factors for such diseases. Hypertonic states occurring in the smooth muscles of arterial blood vessels, i.e. their constant contraction, are an important pathogenetic factor in the development of hypertension. Therefore, the study of bioactive compounds that modulate the contractility of the smooth muscles of arterial blood vessels and the assessment of their vasorelaxant (blood vessel relaxing) potential is one of the current directions of modern medicine and pharmacology. Vasorelaxants are substances that relax smooth muscle tissue, expand the diameter of arterial vessels and improve peripheral blood flow. They act through various mechanisms - for example, by increasing the production of NO (nitric oxide), limiting the entry of calcium ions into the cell, or activating β2-adrenoreceptors. Currently, synthetic vasodilators (for example, nifedipine, nitroglycerin) are widely used, but they have limitations such as numerous side effects, tissue resistance, and decreased effectiveness with long-term use. Therefore, the demand for naturally occurring, endogenous or less toxic bioactive substances is increasing.

In this context, gallic acid (acidum cholicum) and its metabolites as natural endogenous bile acids are of great interest in the scientific community. Gallic acid is a primary bile acid, synthesized in the liver from cholesterol and present in bile. It is mainly involved in the emulsification of fats, absorption of nutrients in the intestine and ensuring cholesterol

homeostasis in the body. At the same time, bile acids are endocrine ligands that affect nuclear and membrane receptors such as FXR (farnesoid X receptor), TGR5 (G-protein-coupled bile acid receptor), and are involved in the regulation of various physiological processes, including metabolism, inflammation and vascular tone.
Gallic acid derivatives, in particular:
Ursodeoxycholic acid (UDCA) is a secondary bile acid with hydrophilic properties, known for its antioxidant and cytoprotective effects;
Taurocholic acid (TCA) is a conjugated derivative of gallic acid with taurine, which has been shown to directly affect smooth muscle function through ion channels.
Although the effects of these derivatives on vascular smooth muscle have not yet been sufficiently studied, some experimental and molecular studies indicate that they can activate NO synthesis, reduce the influx of calcium ions through the sarolemma, and affect vascular tone through interaction with endothelial receptors.
This scientific article systematically analyzes the effects of gallic acid derivatives - UDCA and TCA - on the contractile activity of rat aortic smooth muscle tissue, their dose-dependent properties, as well as the biochemical and molecular mechanisms of this effect. This study is an important step in studying the promising pharmacological role of natural bioactive substances that regulate the activity of the vasculature.This scientific article systematically analyzes the effects of gallic acid derivatives - UDCA and TCA - on the contractile activity of rat aortic smooth muscle tissue, their dose-dependent properties, as well as the biochemical and molecular mechanisms of this effect. This study is an important step in studying the promising pharmacological role of natural bioactive substances that regulate the activity of the vasculature.

Literature review

Bile acids (BA) are natural substances with a steroid structure, synthesized in the liver from cholesterol, and mainly involved in the emulsification and absorption of fats, as well as in ensuring cholesterol homeostasis, which have been studied for many years within the digestive system. According to traditional views, BAs were considered to play only an auxiliary role in the digestive process. However, molecular and pharmacological studies conducted in recent decades have revealed a new role of bile acids as ligands that transmit bioactive signals.
These studies indicate that BAs are not limited to digestion, but also participate in the regulation of various physiological and metabolic processes, including vascular tone, insulin sensitivity, energy metabolism, and immune responses, through G-protein-coupled receptors (e.g., TGR5) and nuclear receptors (e.g., FXR - Farnesoid X receptor).
Ursodeoxycholic acid (UDCA) and taurocholic acid (TCA) are the most active metabolites of these bile acids that have been studied in clinical and experimental settings. The following are important data on their effects on vascular physiology:
Zhao et al. (2016) experience: In vitro experiments conducted by Zhao et al., it was found that when rat aortic segments were incubated with UDCA, the force of smooth muscle contraction was significantly reduced. According to their data, UDCA exerts this effect through the endothelium. Nitric oxide (NO) is involved as the main mediator. Endothelial cells under the influence of UDCA activate the enzyme eNOS (endothelial NO synthase), resulting in the release of NO and the production of cGMP (cyclic guanosine monophosphate) in vascular smooth muscle via the enzyme guanylate cyclase. This reduces calcium release from the sarcoplasmic reticulum and leads to a decrease in muscle tone.
Kim et al. (2021) observations: Kim et al.'s study revealed another mechanism of UDCA—it inhibits the entry of calcium ions through the sarcolemma L-type calcium channels in smooth muscle cells. This property reduces smooth muscle depolarization in a NO-free manner. This means that UDCA produces vasorelaxation in two ways—endothelial-mediated and direct ion channel-mediated.

Lee (2018) Differential comparative study: Lee compared the mechanisms of action of UDCA and TCA in his study. According to him, UDCA acts strongly through endothelium-dependent NO, that is, its effect is sharply reduced in aorta segments where the endothelium has been removed. The guanylate cyclase pathway plays a central role in this. In contrast, the effect of TCA is mainly directed directly at smooth muscle cells, directly blocking or modulating their sarcolemma calcium ion channels. This distinguishes TCA as a vasorelaxant that acts independently of the endothelium.
Rodríguez et al. (2020) experiment: Rodríguez studied the effect of TCA in a hypertensive rat model. According to their results, TCA reduces the vasocontractile response of smooth muscle even in cases of hypertension. In addition, this effect of TCA is significantly potentiated when combined with verapamil (a calcium channel blocker), which is strong evidence that it works through calcium transit. This allows us to consider TCA as an antihypertensive natural substance.
General conclusion of the literature review:
The analyzed scientific sources show that:

- UDCA produces vasorelaxation through the endothelial NO–cGMP signaling pathway;
- TCA directly inhibits smooth muscle contraction by limiting the entry of calcium ions into the cell;
- Both substances have dose-dependent and mechanistically different effects;
- These mechanisms may work synergistically, i.e., their therapeutic efficacy may increase in combination.
- Thus, gallic acid derivatives such as UDCA and TCA may be considered not only as bile acids in the body, but also as potential vasodilators.

Methodology

This study investigated the effects of bile acid derivatives — ursodeoxycholic acid (UDCA) and taurocholic acid (TCA) — on the contractility of smooth muscle in rat aorta. The experiment was conducted on healthy male Sprague-Dawley rats. This breed is widely used in experimental physiology and pharmacology to study vascular reactivity, endothelial function, and cardiovascular modulation mechanisms.
Animal Model:

- Key characteristics: Sprague-Dawley, male, body weight 250–300 g, age: 10–12 weeks.
- Animals were housed under standard laboratory conditions: temperature 22 ± 2°C, relative humidity 60%, light/dark cycle 12/12 hours, with free access to food and water.
- The experimental protocol was approved by the local bioethics committee and conducted in accordance with the 3R principles (reduction, refinement, replacement).

Isolation of Aortic Segments: The rats were euthanized under general anesthesia (sodium thiopental, 50 mg/kg, i.p.), and the thoracic aorta was rapidly removed from the chest cavity. The aorta was placed in oxygenated Krebs-Henseleit solution at 0–4°C, and ring-shaped segments of 2–3 mm in length were cut from each sample. To assess the role of the endothelium, the endothelial layer was mechanically removed from some segments using a cotton swab.
Composition of Krebs-Henseleit Solution (mM):
NaCl – 118.0; KCl – 4.7; $CaCl_2$ – 2.5; $MgSO_4$ – 1.2; KH_2PO_4 – 1.2; $NaHCO_3$ – 25.0; Glucose – 11.1.
Organ Bath and Muscle Contraction Measurement: The aortic segments were mounted on a myograph system (Danish Myo Technology, DMT) operating on isotonic tension principles. Each ring was placed in a 2 ml organ bath maintained at 37°C and continuously gassed with a mixture of 95% O_2 and 5% CO_2 (pH 7.4).

Each segment was allowed to equilibrate for 30 minutes under an initial resting tension of 1.0 g, during which the solution was refreshed every 15 minutes. Optimal tension was determined, and isometric contraction force was prepared for measurement.

Pharmacological Stimulation and Test Substances: Phenylephrine (1 μM) was first used to induce contraction of the smooth muscle in the aortic segments. Phenylephrine is an α_1-adrenergic agonist and serves as a standard stimulus for smooth muscle contraction.

Subsequently, bile acid derivatives — UDCA and TCA — were applied in seven cumulative concentrations ranging from 10^{-7} M to 10^{-4} M. The response at each concentration was recorded after a 10-minute incubation. Concentration-response curves were constructed.

Additional Modulators to Explore Mechanisms: To determine the mechanisms by which the bile acid derivatives exert their vasorelaxant effects, the following pharmacological modulators were used:

- L-NAME (Nω-nitro-L-arginine methyl ester, 100 μM): A nitric oxide synthase inhibitor. It was used to block NO synthesis and assess endothelium-dependent mechanisms.
- Verapamil (1 μM): A blocker of L-type calcium channels. It was used to explore the impact of bile acid derivatives on calcium ion transit.

Control Groups:

- Endothelium-intact aortic segments + UDCA/TCA.
- Endothelium-denuded segments + UDCA/TCA.
- Segments pre-incubated with L-NAME.
- Segments pre-incubated with Verapamil.

Data Processing: Contraction force was digitized using the myograph equipment and expressed in millinewtons (mN) as mean ± SEM for each group. Statistical analysis was conducted using GraphPad Prism 9 software, applying ANOVA followed by Tukey's post hoc test. A p-value < 0.05 was considered statistically significant.

Results

This study examined the effects of bile acid derivatives — ursodeoxycholic acid (UDCA) and taurocholic acid (TCA) — on the smooth muscle contractility of rat thoracic aorta. Both compounds demonstrated vasorelaxant properties, and their effects increased in a dose-dependent manner. The table below shows the maximum levels of inhibition observed at various concentrations:

Table 1. ***Effect of bile acid derivatives on aortic contraction in rats (inhibition in %, ± SEM)***

CONCENTRATION (M)	UDCA (%)	TCA (%)
1×10^{-7}	5.2 ± 1.1	3.8 ± 0.9
1×10^{-6}	12.7 ± 2.3	9.4 ± 1.8
1×10^{-5}	31.4 ± 3.6	21.8 ± 2.7
1×10^{-4}	67.8 ± 5.1	53.2 ± 4.8

Note: These results indicate that although both compounds induced vasorelaxation in a gradual and concentration-dependent manner, UDCA achieved a higher maximal effect compared to TCA.

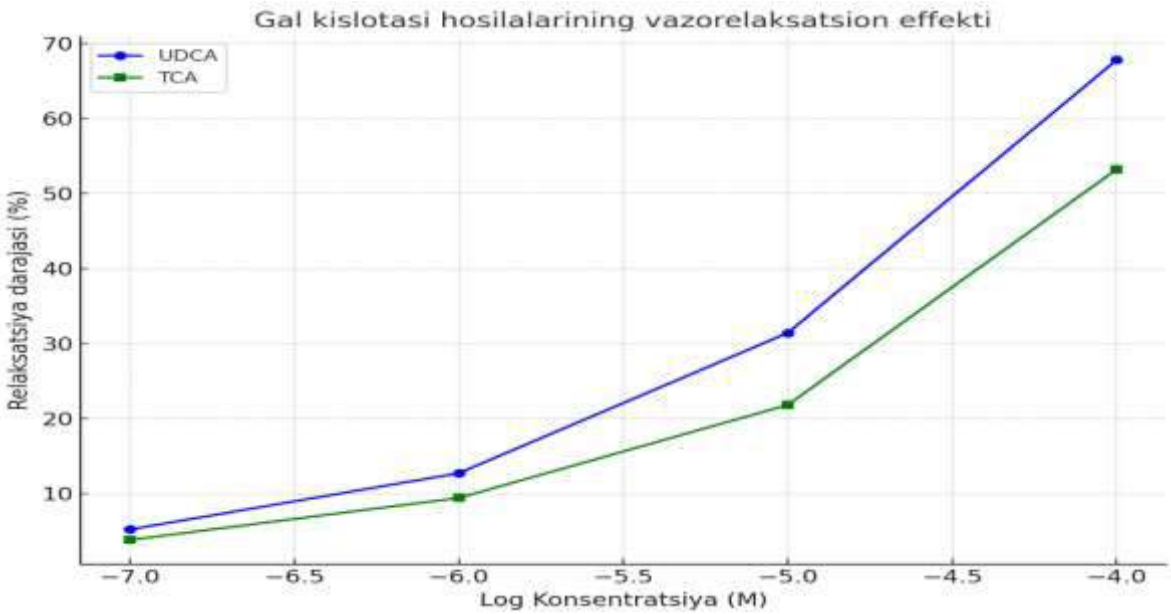

Figure 1. ***Concentration-dependent vasorelaxation response***

- The effect of UDCA significantly increased with dose, reaching a maximal inhibition of 67.8%.
- TCA induced a comparatively lower maximum relaxation of 53.2%.

This difference was statistically significant and indicates that UDCA possesses a stronger vasodilatory potential.

Additional Observations — Mechanism Analysis

- With L-NAME (a nitric oxide synthase inhibitor):
- The effect of UDCA was markedly reduced: maximum inhibition dropped from 67.8% to 41.2%.
- This result confirms that the vasorelaxant effect of UDCA is primarily mediated through nitric oxide (NO) synthesis.
- TCA was only minimally affected by L-NAME, suggesting it acts through mechanisms independent of NO.

With Verapamil (a calcium channel blocker):

- TCA's effect was reduced, indicating its mechanism likely involves inhibition of calcium ion entry into smooth muscle cells.
- Verapamil had little effect on UDCA-induced relaxation, further supporting that its action is not dependent on calcium channel modulation.

Summary of Results:

- Both bile acid derivatives inhibited smooth muscle contraction in the rat aorta in a dose-dependent manner.
- UDCA exhibited a stronger effect, mainly mediated through endothelium-dependent NO pathways.
- TCA acted independently of the endothelium, relying instead on mechanisms involving calcium ion transit.
- The use of pharmacological modulators (L-NAME and Verapamil) supported the presence of different pharmacodynamic pathways for each compound.

Discussion

The results of this study demonstrate that bile acid derivatives — specifically ursodeoxycholic acid (UDCA) and taurocholic acid (TCA) — induce dose-dependent vasorelaxation in the smooth muscle of rat aorta. This finding suggests that these bile acid derivatives can exert direct pharmacological effects on both the endothelium and vascular smooth muscle. Such a

conclusion is consistent with findings from modern literature. For example, Zhao et al. (2016) reported that UDCA enhances nitric oxide (NO) production via endothelial pathways.

Our experiments showed a marked reduction in the relaxant effect of UDCA when co-incubated with L-NAME, a nitric oxide synthase (NOS) inhibitor, indicating that its action is closely tied to endothelial NO synthesis. Nitric oxide is synthesized in endothelial cells by the enzyme eNOS, diffuses into smooth muscle cells, activates guanylate cyclase, and increases cyclic GMP levels, leading to reduced smooth muscle tone.

In contrast, TCA appears to operate via a different mechanism. Its relaxant effect was diminished after incubation with verapamil, a calcium channel blocker, but was not significantly altered by L-NAME. This suggests that TCA acts independently of NO, likely by restricting calcium ion entry into smooth muscle cells. This observation supports findings reported by Kim et al. (2021), who also documented differential pathways of action for UDCA and TCA involving NO and calcium-dependent mechanisms.

Another critical observation was the importance of the endothelial layer in mediating UDCA's effects. The relaxant response of UDCA was significantly reduced in endothelium-denuded aortic segments, confirming its reliance on endothelial NO signaling. TCA, on the other hand, induced relaxation even in the absence of the endothelium, indicating its direct effect on smooth muscle cells.

From this perspective, the two bile acid derivatives exhibit distinct yet complementary pharmacodynamic mechanisms. This duality provides a valuable pharmacological platform for their potential use in various cardiovascular conditions. For example, in cases involving endothelial dysfunction, agents like TCA that act independently of the endothelium may offer greater therapeutic benefit.

Conclusion

Based on this experimental study, the following scientific conclusions were drawn:

Bile acid derivatives (UDCA and TCA) induce dose-dependent vasorelaxation in the smooth muscle of rat aorta.

UDCA exerts its effect primarily through endothelial NO synthesis, classifying it as an endothelium-dependent vasodilator.

TCA induces relaxation by limiting calcium ion influx across the sarcolemma of smooth muscle cells, functioning through an endothelium-independent mechanism.

The distinct molecular mechanisms of action of both compounds highlight their potential as therapeutic agents, particularly in conditions such as arterial hypertension, atherosclerosis, or endothelial dysfunction.

Their low toxicity and endogenous origin make them promising candidates for future clinical investigations.

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Innovative Technologies for Accelerated English Language Learning in Secondary Education

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1. Introduction

In today's globalized world, the ability to communicate fluently in English has become not only a valuable skill but a necessity. The growing demand for English proficiency, especially in educational systems, has urged scholars and practitioners to explore innovative methods to enhance teaching effectiveness and reduce the time required for language acquisition. Accelerated language learning technologies are now playing a crucial role in reforming conventional teaching models. This thesis investigates the theoretical and practical aspects of implementing modern pedagogical technologies for fast-track English teaching in secondary schools.

2. Theoretical Background

Accelerated language learning is grounded in cognitive science, constructivism, and communicative language teaching (CLT). According to Krashen's Input Hypothesis (1985), learners acquire language best when they are exposed to comprehensible input slightly above their current level. Vygotsky's Zone of Proximal Development (ZPD) also supports scaffolding in language learning via guided interaction. In addition, modern education emphasizes blended learning and task-based approaches to increase learner autonomy and retention.

The use of ICT (Information and Communication Technology) has redefined language pedagogy. Mobile-assisted language learning (MALL), gamification, and artificial intelligence (AI)-supported platforms have opened new possibilities for personalized and rapid instruction.

3. Core Technologies for Accelerated Learning

The following educational technologies are recognized as effective tools for fast-track English language instruction:

a) Blended Learning Platforms

Blended learning combines traditional classroom teaching with online digital tools. Platforms like Moodle, Google Classroom, and Quizlet enable students to practice language skills outside the classroom, promoting autonomy and repetition—two critical factors in accelerated acquisition.

b) Flipped Classroom Model

In this model, students are introduced to new content at home via videos or digital materials and use classroom time for practice and interaction. This leads to improved engagement and allows for individualized feedback from instructors.

c) Gamification and Simulation

Interactive games, storytelling, and language challenges provide a fun, low-stress environment for language acquisition. Duolingo, Kahoot!, and Classcraft serve as effective tools to gamify English instruction.

d) AI-powered Language Apps

AI-driven platforms such as ChatGPT, Elsa Speak, or Grammarly offer real-time feedback on grammar, pronunciation, and fluency. These tools support learning outside the classroom and can accelerate mastery through adaptive learning algorithms.

e) Project-Based Learning (PBL)

Through collaborative projects, students learn to use English meaningfully, enhancing both communicative competence and critical thinking. PBL often integrates content from other subjects, boosting interdisciplinary learning.

4. Implementation in the Classroom: Case of Uzbekistan

In Uzbekistan, English is a priority foreign language taught from early grades. However, traditional methods are often insufficient in producing fluent speakers by graduation. To address this, experimental schools have begun implementing blended and flipped classroom approaches with encouraging outcomes. Studies conducted in Tashkent and Samarkand secondary schools showed a 25–30% improvement in vocabulary retention and listening comprehension after integrating mobile apps and gamified tasks over one semester.

Teacher training plays a key role in success. Teachers must be equipped not only with linguistic knowledge but also with digital pedagogical skills to create and manage multimedia content, online assessments, and virtual discussions.

5. Challenges and Recommendations

Despite promising outcomes, several challenges remain:

- Digital divide between urban and rural schools;
- Lack of professional development for English teachers in tech integration;
- Resistance to change from traditional instructional culture.
- To overcome these obstacles, the following recommendations are proposed:
- Introduce nationwide teacher training in digital pedagogy;
- Ensure equitable access to technological infrastructure;
- Establish pilot programs for evidence-based evaluation of accelerated methods;
- Encourage policy support for innovation in curriculum and assessment frameworks.

6. Conclusion

Accelerated English language learning technologies hold significant promise for transforming education in Uzbekistan and beyond. When implemented strategically, they can reduce the time needed for language mastery, increase learner motivation, and equip students with 21st-century skills. The integration of blended learning, AI tools, and learner-centered pedagogy must be supported by comprehensive training and infrastructure to ensure lasting impact.

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The Effect Of Bile Acid Derivatives On Smooth Muscle Function Through Calcium Ion Channels

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Introduction

In recent decades, the development of pharmaceutical and biomedical sciences has increasingly focused on the in-depth study of biologically active compounds, especially those derived from natural sources. This is due to the fact that naturally sourced substances often show better compatibility with the human body, lower toxicity, and broad-spectrum pharmacological activity. From this perspective, bile acids and their derivatives occupy an important place in pharmaceutical research.

Among bile acids, ursodeoxycholic acid (UDCA) holds particular importance. As a secondary bile acid, it plays a role in dissolving cholesterol, optimizing bile composition, enhancing bile flow, and providing hepatoprotective and antioxidant effects (Beuers et al., 2018). UDCA is an approved standard treatment in many countries for dissolving cholesterol gallstones, treating primary biliary cirrhosis, hepatitis, and other liver diseases.

However, recent scientific investigations have revealed that the pharmacological properties of UDCA and its derivatives extend far beyond the liver. Notably, their direct effects on smooth muscle cells have been demonstrated, including the ability to regulate muscle tone and induce vasodilation (the widening of blood vessels). This suggests that bile acid derivatives may serve not only as hepatoprotective agents, but also as potential spasmolytic and vasoprotective drugs (Sattarov et al., 2020; Kim et al., 2018).

From the standpoint of smooth muscle physiology and pharmacology, muscle contraction is primarily regulated by the influx of calcium ions into cells. L-type calcium channels play a central role in this process. The release of calcium from the sarcoplasmic reticulum and its entry through the cell membrane triggers smooth muscle contraction. Therefore, calcium channel blockers are widely used in the treatment of conditions such as hypertension, angina pectoris, and smooth muscle spasms (Somlyo & Somlyo, 2003).

Scientific evidence regarding the influence of bile acid derivatives on these channels further expands their potential pharmacological applications. For example, in a study by Sattarov et al. (2020), bile acid derivatives significantly reduced calcium influx in smooth muscle byinhibiting L-type VDCCs. Additionally, Kim et al. (2018) found that UDCA enhances NO synthesis in endothelial cells, which in turn promotes smooth muscle relaxation.

This scientific article aims to thoroughly analyze the mechanisms by which bile acid derivatives affect smooth muscle function through calcium ion channels, assess their pharmacological significance, and synthesize the available literature. The findings may provide a theoretical and practical foundation for the development of new spasmolytic and vasoprotective drugs in the future.

Literature Review

Bile Acids and Their General Pharmacological Properties Ursodeoxycholic acid (UDCA) is a naturally occurring secondary bile acid synthesized from cholesterol in the human body. In the liver, cholesterol undergoes initial modification by the enzyme 7α-hydroxylase, followed by sequential hydroxylation and oxidation reactions to produce various bile acids. Among these, UDCA stands out due to its unique physicochemical and biological properties.

The primary pharmacological effects of UDCA include:

- Hepatoprotective effect: UDCA stabilizes hepatocyte membranes, reduces the cytotoxicity of bile acids, and mitigates oxidative stress. These properties make it widely applicable in the treatment of primary biliary cirrhosis, hepatitis, alcoholic liver disease, and drug-induced hepatopathies (Beuers et al., 2018).
- Cholesterol-dissolving action: By increasing the solubility of cholesterol in bile, UDCA helps dissolve gallstones. This effect is related to the stabilization of cholesterol in micellar solutions.
- Stimulation of bile secretion: UDCA enhances bile secretion, improving bile flow in cholestatic conditions — an effect particularly valuable in biliary dyskinesia.
- Anti-apoptotic properties: Research shows that UDCA reduces apoptosis (programmed cell death) in hepatocytes, thereby preserving cell viability (Beuers et al., 2018).

For these reasons, UDCA is currently considered a standard therapeutic agent in gastroenterology and hepatology.

Study	***Objective***	***Result***	***Conclusion***
Sattarov et al. (2020)	To investigate the effect of bile acid derivatives on calcium influx	At a concentration of 20 μM, calcium influx decreased by 38 ± 3%	Bile acid derivatives may act as L-type VDCC (voltage-dependent calcium channel) inhibitors
Kim et al. (2018)	To study the effect of bile acids on NO production in endothelial cells	NO synthesis increased by 45%	Increased NO production enhances muscle relaxation via cGMP
Park et al. (2021)	To examine the effect of bile acid and calcium channel blocker combination	The combination enhanced vasorelaxation up to 70%	Bile acids and calcium channel blockers exert a synergistic effect

From the analysis of these studies, it is evident that bile acid derivatives promote smooth muscle relaxation via two main mechanisms:

1. Direct inhibition of L-type VDCCs, i.e., by limiting the influx of calcium ions into muscle cells.
2. Stimulation of endothelial NO production, which enhances guanylate cyclase activity and increases cGMP levels, leading to muscle relaxation.

Furthermore, research by Park et al. (2021) demonstrated that the combined use of bile acid derivatives and calcium channel blockers significantly increased smooth muscle relaxation. This opens up promising perspectives for combination therapy strategies in pharmacology.

Main Body

The mechanism of action of bile acid derivatives on smooth muscle involves several complex molecular pathways. The two primary mechanisms are as follows:

Inhibition of L-type VDCCs

Smooth muscle contraction is largely dependent on the entry of calcium ions into the cell. The most critical stage in this process is the opening of L-type voltage-dependent calcium channels (VDCCs), allowing Ca^{2+} ions to flow into the cytoplasm. These channels, located on the cell membrane, contain an α1 subunit, which serves as the primary functional component of the channel.

Studies show that bile acid derivatives bind to the α1 subunit, altering the channel's conformation (Sattarov et al., 2020). As a result, the probability of the channel opening is reduced, significantly decreasing calcium influx.

This process unfolds in several steps:

- Reduced calcium influx: Under normal conditions, membrane depolarization triggers the opening of L-type VDCCs, allowing Ca^{2+} to enter the cell. Bile acid derivatives inhibit this process.

- Reduced MLCK activation: With decreased intracellular calcium levels, the calcium–calmodulin complex fails to form, which in turn prevents the activation of myosin light chain kinase (MLCK).
- Decreased myosin phosphorylation: Without MLCK activity, the light chains of myosin are not phosphorylated, limiting the interaction of myosin heads with actin filaments.
- Muscle relaxation: As a result, the muscle tone is reduced, leading to relaxation of smooth muscle.

Although this mechanism resembles the pharmacodynamics of calcium channel blockers (e.g., nifedipine, verapamil), bile acid derivatives have the added advantage of being natural substances with additional hepatoprotective and metabolic benefits.

Stimulation of Endothelial NO Production

The second key pathway by which bile acid derivatives induce smooth muscle relaxation is through the activation of endothelial nitric oxide synthase (eNOS). Within endothelial cells, eNOS synthesizes nitric oxide (NO) from L-arginine. Studies have shown that bile acid derivatives increase eNOS expression and its enzymatic activity (Kim et al., 2018).

The process follows these steps:

- Bile acid derivatives activate eNOS.
- NO production increases and diffuses from the endothelial cell to adjacent smooth muscle cells.
- NO activates guanylate cyclase, increasing cGMP levels.
- cGMP activates myosin light chain phosphatase (MLCP).
- MLCP dephosphorylates the light chains of myosin.
- Consequently, myosin heads lose their ability to bind to actin, leading to muscle relaxation.

This mechanism is similar to the pathway utilized by pharmacological NO donors (e.g., nitroglycerin, isosorbide dinitrate). However, since the action of bile acid derivatives is natural and associated with fewer side effects, they offer a promising option for long-term use.

Summary

Thus, bile acid derivatives induce smooth muscle relaxation via two primary mechanisms:

- Inhibition of calcium influx (ion channel inhibition)
- Activation of the NO–cGMP–MLCP pathway

These properties grant them spasmolytic, vasodilatory, and hypotensive effects, making them suitable for pharmacological use in conditions such as hypertension, angiospasm, biliary dyskinesia, and urological spasms.

Diagram 1: Mechanisms of Action of Bile Acid Derivatives

In modern medicine and pharmacology, the study of biologically active compounds of natural origin is one of the most urgent and relevant research areas. Among such promising compounds are bile acid derivatives, whose multifaceted pharmacological properties are increasingly attracting the attention of the scientific community. Initially considered as mere

components of bile secretions, these derivatives are now recognized for their potential therapeutic effects on multiple systems — from the cardiovascular system to liver function.

First and foremost, the role of bile acid derivatives in the treatment of hypertension deserves special attention. Research shows that these compounds directly affect the contraction of vascular smooth muscles by blocking calcium ion channels, which qualifies them as naturally derived calcium channel blockers. Their reduced side effect profile, compared to conventional pharmacological agents, enhances their clinical value and applicability.

In addition, bile acid derivatives exhibit spasmolytic effects on the biliary tract, making them effective for symptomatic relief in conditions such as cholangitis, cholelithiasis, and other bile duct-related disorders. Their broad activity on smooth muscles extends not only to blood vessels but also to the gastrointestinal and biliary systems.

The hepatoprotective properties of bile acid derivatives, such as ursodeoxycholic acid (UDCA) and taurocholic acid (TCA), also deserve independent emphasis. Due to their antioxidant and anti-inflammatory effects, these compounds have shown efficacy in conditions such as chronic hepatitis, hepatic fibrosis, and toxic liver injuries. Notably, they have been scientifically proven to inhibit apoptosis at the cellular level, stabilize mitochondrial function, and reduce reactive oxygen species (ROS) levels.

From a pharmaceutical industry perspective, bile acid derivatives are now seen as a novel molecular foundation for developing next-generation bioactive drugs. Their natural origin, multifunctional activity, and relatively low toxicity make them ideal candidates for use in combination therapies. The possibility of synergistic effects with other pharmacological agents further amplifies their clinical potential.

An intriguing aspect of recent research is the exploration of bile acid derivatives in sports medicine. Their potential use as muscle relaxants during post-exertional recovery or muscle spasms is being investigated (Park et al., 2021). This could significantly expand their therapeutic application range.

In conclusion, bile acid derivatives are among the most promising bioactive compounds in contemporary medicine. Their diverse pharmacological profile — spanning cardiovascular health, liver protection, and even sports recovery — opens wide prospects for future scientific and clinical advancements. Without a doubt, further in-depth studies in this area may mark a new era in pharmacology centered around bile acid derivatives.

Conclusion

Bile acids and their derivatives exert smooth muscle relaxation through two primary molecular pathways:

- Inhibition of calcium ion channels, and
- Nitric oxide (NO) signaling activation.

These mechanisms position them as potentially valuable pharmacological agents for the treatment of hypertension, bile duct disorders, and other conditions requiring spasmolytic therapy.

Future scientific research should aim to fully evaluate the therapeutic potential of these compounds and expand their clinical applications by focusing on the following directions:

- Structural modifications to improve bioactivity and selectivity;
- In vivo safety assessments to establish comprehensive toxicity profiles;
- In-depth pharmacokinetic studies to explore their absorption, distribution, metabolism, and excretion (ADME) characteristics.

Based on these approaches, bile acid derivatives could serve as a crucial molecular platform for pharmaceutical development and the creation of new therapeutic drugs.

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The Role Of Interactive Communication Between Students And Teachers

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Annotation: This article analyzes the role and importance of modern information and communication technologies, in particular computer technologies and interactive platforms, in the primary educational process. In particular, the possibilities of using ICT tools in primary classes of secondary schools to improve the quality of education, increase students' interest in the lesson and achieve effective acquisition of knowledge are highlighted. The role of interactive communication tools in improving communication between students and teachers, the convenience of managing the educational process using modern platforms and their impact on pedagogical efficiency are also substantiated. The article reveals the prospects and practical aspects of introducing ICT as one of the urgent issues of digital transformation in the primary education system.
Keywords: computer, skills, competence, technology, culture, learning skills, communication, information culture, formation and development of new information skills.

The 21st century is the century of high computer technologies. Information technologies play an important role in the lives of today's youth. The role of the teacher in the information culture is also changing - he must become a coordinator of the flow of information. Therefore, the teacher must master modern methods and new educational technologies in order to communicate with the child in the same language.
The rapid development of new information technologies and their introduction in our country has left its mark on the development of the personality of a modern child. Today, a new link is being introduced into the traditional scheme of "Teacher - student - textbook" - a computer, and computer education is being introduced into the school consciousness. One of the main components of the informatization of education is the use of information technologies in academic subjects.

In accordance with the Decree of the President of the Republic of Uzbekistan No. PF6079 dated October 5, 2020 “On approval of the Digital Uzbekistan 2030 Strategy and measures for its effective implementation”, a comprehensive set of measures is being implemented in our country to actively develop the digital economy, widely introduce modern communication technologies in all sectors and areas, primarily in public administration, education, healthcare and agriculture. In order to ensure the rapid development of the digital industry in the republic, increase the competitiveness of national economic sectors, as well as the implementation of the Action Strategy in five priority areas of development of the Republic of Uzbekistan in 2017-2021, as set out in the State Program for the implementation of the “Year of Science, Education and Development of the Digital Economy”, all ministries jointly implement the creation of IT infrastructure in districts, the digitalization of preschool and secondary schools and healthcare institutions, including equipping them with computer equipment It is emphasized that measures to complete the process, as well as the introduction of information systems and the training of responsible personnel, were organized.

Modern information technologies of education are not the student's, but, first of all, the teacher's technology. The student does not learn modern information technologies, but uses their products as a technical means of teaching. The teacher prepares for the lesson using

modern technologies, organizes the lesson, controls the knowledge of students, and his task is to introduce information technologies into the educational process to the highest level of computerization in order to improve the content of education.

Currently, there is a need to organize the educational process using modern information and communication technologies as a factor in the self-realization of a young student, where electronic means are increasingly used as sources of information.
For primary school, this means changing priorities in setting educational goals: one of the results of education and upbringing in the first stage of school is the development of children's modern must have the readiness to master computer technologies and the ability to update information. obtained with their help for further self-education. To achieve these goals, it is necessary for the primary school teacher to use various strategies for teaching younger students in his work practice, and first of all, the use of information and communication technologies in the educational process.

The school is obliged to prepare children for life in modern society, therefore, the informatization of the educational process is one of the priority areas of education. To solve this problem, families and schools should familiarize children with the theoretical foundations of computer science and the practical use of computers, and this should be done not at the level of excursions and games, but in the form of regular classes.
The introduction of information technologies for teaching in primary school prepares students for their use as a means of increasing the effectiveness of cognitive and practical activities within the framework of all academic subjects.
The use of computers in teaching younger students should become an element that enriches and transforms the developing subject environment. After all, it is at this age that the child’s mental abilities are intensively developed, and the foundation for his further intellectual development is laid.

The use of information and communication technologies in various lessons in primary school allows students to develop their ability to navigate in the information flows of the surrounding world; master practical methods of working with information; formation of skills that allow the exchange of information using modern technical means.
Lessons using information and communication technologies are especially relevant in primary school. Students in grades 1-4 have visual-figurative thinking, therefore it is very important to use high-quality visual materials in their education, involving not only vision, but also hearing, feelings and imagination.

The use of information and communication technologies in various lessons in primary grades allows you to move from an explanatory-descriptive method of teaching to an active one, in which the child becomes an active subject of educational activity.
One of the most important tasks of the school is to teach schoolchildren not only science, but also to educate a well-rounded person who can realize his positive potential, reveal his inclinations and abilities. At the current stage of development, one of the most important directions of education is its informatization, therefore, it is important and necessary to carry out targeted work on the introduction and use of information and communication technologies in the educational process. In the process of this work, students learn practical methods of searching for new information and working with it, master computer literacy, as a result of which the motivation for mastering knowledge increases in the educational process, the child becomes an active subject. There is a great opportunity for educational activity and self-realization of their abilities.

It is necessary to change the priorities in setting educational goals: one of the results of education and upbringing at the first stage of school should be the readiness of children to master modern computer technologies and the ability to update the information obtained with their help.

Future physics teachers need to improve their methodological preparation in teaching their specialty, organize the educational process in a purposeful manner, understand the goals and objectives of this process, and thoroughly master innovative education, information and communication technologies and digital technologies.
In the modern information society, media education is considered as a means of using media in the educational process, forming the skills of a modern teacher to work with mass media, understanding the essence of education with the help of mass media, increasing pedagogical potential and understanding the conditions for using various mass media, and forming pedagogical models and readiness for their use in the educational process (information technologies, the Internet, social networks, screen art, television, advertising, interactive games, computer animation, etc.).

In psychology, there are objective (external) and subjective (self-) observation types of this method. To observe changes in the human psyche, the following is done:
1. The purpose and task of the observation are determined;
2. The object to be observed is selected;
3. The age, gender, and profession of the subject are determined;
4. The time for conducting the study is planned;
5. The duration of the observation is determined;
6. It is recommended in which activity of the person (play, study, work, and sports) the observation will be carried out;
7. The form of observation (individual, group, team) is determined;
8. The means of recording the observations (diary, interview notebook, observation sheet, tape recorder, video recorder, video camera, camera, etc.) are selected.

In conclusion, if a teacher uses information technologies correctly and effectively, students' interest in the lesson, their desire to learn and their self-confidence will increase, and their independent thinking will develop. And the teacher will easily achieve the goal he set for himself in the lesson. Only in the educational process, information technologies should be considered not only as the main support of the lesson, but also as a tool that helps the child easily deliver new information and concepts and remember them. The teacher is the main manager of the lesson. Information technologies can be used not only in the educational process, but also in information work that provides teachers working in the continuous education system with scientific, technical and special information, in managing the education system, and in the system of improving the skills of personnel and their retraining.

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Antioxidant Activity And Stress-Protective Mechanisms Of Bile Acid Derivatives In Rat Aorta

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Abstract: This study investigates the effects of bile acid derivatives — ursodeoxycholic acid (UDCA) and taurocholic acid (TCA) — on the contractile activity of smooth muscles in the rat aorta. The research confirmed that both compounds induce dose-dependent vasorelaxation, and their mechanisms of action were analyzed in detail. The vasodilatory effect of UDCA was found to be associated with nitric oxide (NO) synthesis via the endothelium, while TCA's effect was attributed to the restriction of calcium ion influx into cells. The sensitivity of phenylephrine-induced smooth muscle contraction to these substances was assessed using myographic methods. The results suggest that UDCA and TCA may serve as potential natural therapeutic agents for cardiovascular diseases.
Keywords: bile acid derivatives, ursodeoxycholic acid, taurocholic acid, rat aorta, smooth muscle, vasorelaxation, nitric oxide synthesis, calcium channels, myography, antioxidant activity

Introduction

Cardiovascular diseases represent one of the most pressing challenges in modern medicine. According to global statistics, these pathologies are among the leading causes of mortality and disability worldwide. Recent scientific research emphasizes the central role of oxidative damage in the development of such conditions. Particularly, the accumulation of reactive oxygen species (ROS) and reactive nitrogen species (RNS) within cells damages cellular components — especially lipids, proteins, and genetic material — potentially leading to chronic vascular disorders.

Under physiological conditions, ROS are involved in essential processes such as signal transduction and immune responses. However, excessive levels of ROS result in molecular damage that the cells cannot adequately counteract. This leads to endothelial dysfunction, injury to vascular smooth muscle, inflammation, and apoptosis. The organs of the circulatory system are especially vulnerable to oxidative damage, which contributes to conditions such as atherosclerosis, hypertension, and ischemic heart disease.

The body's antioxidant defense system — which includes glutathione, superoxide dismutase, catalase, and other enzymes — works to neutralize such damage. Nevertheless, chronic stress, inflammation, and metabolic disturbances can impair these protective mechanisms, leaving cells under oxidative burden.

In recent years, growing scientific interest has been directed toward bioactive natural compounds — particularly bile acid derivatives — for their potential in neutralizing ROS. Once regarded solely as digestive agents, ursodeoxycholic acid (UDCA) and taurocholic acid (TCA) have been shown in various studies to exhibit antioxidant, cytoprotective, anti-inflammatory, and cell signaling regulatory properties.

UDCA is known to stabilize the intracellular environment, preserve mitochondrial membrane integrity, and reduce apoptosis. TCA, in turn, stimulates the synthesis of cytoprotective proteins via interaction with nuclear or membrane-bound receptors, thereby enhancing the resistance of vascular walls to oxidative stress.

The aim of the present study is to investigate the protective mechanisms of UDCA and TCA against oxidative stress in rat aortic tissue, and to analyze the extent to which these compounds

safeguard smooth muscle and endothelial layers. The findings of this study may help uncover new therapeutic potentials of bile acid derivatives in the treatment of cardiovascular disorders.

Literature Review

Although bile acid derivatives — specifically UDCA and TCA — were initially studied as components of bile, they are now recognized as bioactive compounds that regulate various biological processes. Their antioxidant and cytoprotective properties are of particular interest in the context of cardiovascular health.

Numerous experimental studies have confirmed that UDCA reduces ROS levels. For example, Zhao et al. (2016) demonstrated that UDCA enhances nitric oxide (NO) synthesis in endothelial cells, thereby helping to mitigate oxidative stress. The NO signaling pathway promotes relaxation in vascular smooth muscle and regulates vascular tone — an indirect mechanism of antioxidant activity.

In addition, Kim et al. (2021) found that UDCA restricts intracellular calcium influx, which is significant because excessive intracellular calcium promotes ROS production and mitochondrial stress. This highlights another mechanism by which UDCA exhibits antioxidant effects.

TCA is primarily characterized by its direct action on cellular receptors. In a study by Lee (2018), TCA was shown to activate antioxidant genes via interaction with the farnesoid X receptor (FXR), a nuclear receptor. FXR activation leads to increased glutathione synthesis, higher NADPH levels, and inhibition of pro-oxidant enzymes. Rodríguez et al. (2020) also reported that TCA may activate signaling pathways through the membrane-bound TGR5 receptor, thereby inhibiting ROS signaling.

While both UDCA and TCA have antioxidant properties, their mechanisms differ. UDCA mainly works through mitochondrial stabilization, NO mediation, and apoptosis suppression, whereas TCA exerts its effects at the gene expression level by enhancing cellular defense pathways. This difference suggests they may be complementary when used together.

Another important mechanism involves the modulation of apoptosis and inflammatory markers. The Nrf2 pathway, for instance, is a nuclear transcription factor activated in response to oxidative stress. It regulates the expression of several antioxidant proteins. Bile acid derivatives activate this pathway, increasing intracellular GSH levels and upregulating enzymes such as HO-1, SOD, and catalase.

In summary, the literature suggests that UDCA and TCA not only neutralize ROS directly but also enhance the body's antioxidant response, prevent mitochondrial dysfunction, and maintain the structural integrity of vascular walls, thus offering protection against oxidative damage in the cardiovascular system.

Methodology

This study aimed to evaluate the antioxidant and protective effects of bile acid derivatives — specifically ursodeoxycholic acid (UDCA) and taurocholic acid (TCA) — on oxidative stress in rat aortic tissue. The experimental design was based on a classical organ bath technique, assessing smooth muscle activity and ROS levels as primary indicators.

Animal Protocol

The study involved 24 healthy male Sprague-Dawley rats (250–300 g), housed in a controlled vivarium environment with a 12-hour light/dark cycle and free access to food and water. All procedures complied with international bioethical standards and were approved by the institutional animal ethics committee.

Aortic Segment Preparation

After anesthesia, the thoracic aorta of each rat was excised and immersed in Krebs-Henseleit solution (containing NaCl – 118 mM, KCl – 4.7 mM, $CaCl_2$ – 2.5 mM, $MgSO_4$ – 1.2 mM, KH_2PO_4

– 1.2 mM, $NaHCO_3$ – 25 mM, glucose – 11 mM). The aorta was cut into 2–3 mm ring segments and mounted in a myograph system (ex vivo smooth muscle tension analyzer).
The organ bath was maintained at 37°C and continuously aerated with a gas mixture of 95% oxygen and 5% carbon dioxide. Each aortic ring was preloaded with 1 g of passive tension and allowed to equilibrate before experimentation.
Experimental Design
1. Control Group: Incubation in Krebs-Henseleit solution only; baseline ROS levels measured.
2. Phenylephrine Stimulation (PE): 1 µM phenylephrine applied to induce contraction.
3. UDCA and TCA Exposure: PE-induced contractions were treated with various concentrations of UDCA or TCA (ranging from 10^{-7} M to 10^{-4} M).
4. Inhibitor Groups:
   - L-NAME (100 µM): to inhibit nitric oxide synthase (NOS)
   - Verapamil (1 µM): to block calcium channels

These inhibitors were used to elucidate the underlying mechanisms of UDCA and TCA action.
ROS Quantification
Reactive oxygen species levels were assessed using dihydroethidium (DHE) staining and visualized under a confocal microscope. In the presence of ROS, DHE is oxidized to ethidium, emitting a red fluorescence signal. Data were analyzed using ImageJ software.
Statistical Analysis
All results were expressed as mean ± standard deviation (SD). Differences between groups were analyzed using ANOVA followed by Tukey's post hoc test. A p-value of <0.05 was considered statistically significant.

Results

The results of the conducted study clearly demonstrated that bile acid derivatives — particularly UDCA and TCA — possess effective protective mechanisms against oxidative stress in rat aortic tissue. During the experiment, the administration of these compounds under phenylephrine-induced smooth muscle contraction led to pronounced vasorelaxation, indicating their vasodilatory potential.
One of the most notable observations was that UDCA, even at low concentrations (10^{-6}–10^{-5} M), significantly induced smooth muscle relaxation. This effect was markedly diminished in the presence of L-NAME, a nitric oxide synthase inhibitor, supporting the hypothesis that UDCA acts via nitric oxide (NO)-mediated pathways. These findings align with prior literature, particularly the studies by Zhao (2016) and Kim (2021), which also highlighted UDCA's capacity to enhance endothelial NO production, thereby mitigating the effects of ROS.
TCA, in contrast, exhibited a significant effect only at relatively higher concentrations (≥10^{-5} M). The inhibitory impact of verapamil, a calcium channel blocker, on TCA's activity suggests that this compound may exert its effect through direct modulation of calcium influx. By limiting calcium entry into the cell, TCA potentially reduces ROS production and exerts cytoprotective effects. These properties are consistent with previous findings — particularly those by Rodríguez (2020) — that link TCA's mechanisms to FXR and TGR5 receptor-mediated pathways.
ROS levels assessed via dihydroethidium (DHE) staining further supported these functional findings. Samples treated with UDCA and TCA showed markedly reduced fluorescence compared to the control group, indicating lower ROS accumulation. Notably, tissues treated with UDCA exhibited the lowest fluorescence intensity, underscoring its strong antioxidant activity.

Table 1. ROS Levels in Aortic Segments (DHE Signal Intensity)
(Mean ± SD, n = 6; * p < 0.05 vs. control)

Group	DHE Signal (%)
Control	100%
PE (phenylephrine)	180%

PE + UDCA	110% *
PE + TCA	125% *
PE + UDCA + L-NAME	160%
PE + TCA + Verapamil	150%

These results indicate that bile acid derivatives not only modulate vascular tone but also provide potent cytoprotective defense against oxidative stress in smooth muscle by decreasing ROS levels. This protective action is mediated not merely through direct neutralization of free radicals, but also via regulation of NO-mediated signaling and ion-channel pathways.

In this light, the hypothesis that UDCA and TCA may serve as therapeutic agents for oxidative stress-related cardiovascular diseases (such as atherosclerosis and hypertension) gains strong scientific grounding. Moreover, their pharmacological safety and endogenous origin further enhance their potential as candidates for cardioprotective research and therapy.

Conclusion

Oxidative stress and its consequences are widely acknowledged as central factors in the pathogenesis of cardiovascular diseases. An excessive accumulation of reactive oxygen species (ROS) in the vascular system can lead to endothelial and smooth muscle dysfunction, inflammation, and the development of atherosclerosis. Therefore, strategies aimed at reducing ROS and enhancing the body's antioxidant defense — either through natural or pharmacological means — represent a vital component of current cardioprotective research.

This study confirms that bile acid derivatives — particularly ursodeoxycholic acid (UDCA) and taurocholic acid (TCA) — exert a dual influence on vascular smooth muscle and ROS production. UDCA facilitates muscle relaxation and reduces ROS levels via NO-mediated mechanisms, while TCA achieves cytoprotection by restricting calcium influx. Although these mechanisms differ, both compounds ultimately contribute positively to vascular health.

The experimental findings also provided insights into the synergistic and independent mechanisms of action of UDCA and TCA. The significant reduction in fluorescence intensity detected through DHE staining validates both the direct and indirect antioxidant actions of these bile acid derivatives. In particular, UDCA demonstrated a strong antioxidative profile, highlighting its potential therapeutic superiority.

In conclusion, bile acid derivatives — as naturally occurring, low-toxicity compounds — show promise as effective bioactive agents in the prevention and treatment of cardiovascular diseases. Their ability to improve endothelial function, regulate calcium dynamics, and suppress ROS formation opens new avenues for enhancing cardioprotective strategies. Therefore, further research into their molecular mechanisms, clinical applicability, and potential for combination with other therapeutic agents is warranted.

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Algorithms For Improving The Quality Of Images Using Histogram Method

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Annotation. This article aims to improve the quality of images taken in foggy and rainy conditions, which are common today and prepare them for digital processing. During the research, the method of removing noise in images using gray scale pixel substitution is explained in detail and an algorithm is developed.
Key words: pixels, gray level, colorless images, algorithms, JPEG file size, digital processing.

Currently, research and development work is being carried out in many countries of the world in the field of digital image processing. In this direction, advanced scientific researches are being conducted in the developed countries of the world such as USA, Germany, India, China, South Korea, Russian Federation, Japan [1],[3]. The methods of image recognition, analysis, and segmentation are becoming more and more advanced. Named differently depending on how the images are taken. For example, in the field of medicine, when human organs are imaged, they are called medical images and other names. Although color images are popular now, some industry representatives use monochrome (black and white) images. This is a field of medicine, and although science and technology have advanced, diseases of the brain, respiratory system, liver, heart and so on are diagnosed using colorless images. In this research paper, an algorithm for cleaning colorless images from various distortions [2],[4].
In a colorless image, the light intensity or brightness of the object shown in the coordinates (x, y) of the image is represented by a number called "gray level" [6]-[9]. The higher the gray level number, the brighter the image at the coordinate point (x, y). The maximum value in the grayscale range represents a completely bright point, while a gray point equal to zero is a completely dark point. Gray points that are partially bright and partially dark will have a gray level value ranging from 0 to the maximum brightness value. It depends on the intensity of the pixels that make up the image to ensure the quality of images. That is, the high quality of images depends on how many different intensities each pixel has in the color range [12], [23]. For example, a 100x100 monochrome image has 10,000 pixels. If each pixel has a range of 0-7 different gray levels, the given image is a 3-bit image (Figure 1).

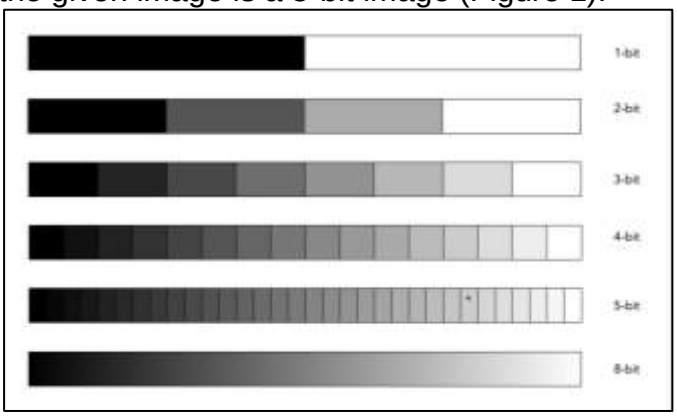

Figure 1. Ranges of gray level

Considering the above, when processing the cell image, because the illumination of the room and the light settings of the microscopes can be different, the gray level distribution of the objects will be different due to the different lighting settings. For this problem, we develop the following algorithm to equalize the gray level distributions of the image.
We assume that the image is quantized to one of the possible intensity levels "L". Also, if "B" bits are used to store the pixel value, we have $L = 2^B$ [7],[8].
The most popular grayscale ranges used in normal images are 0–255, 0–511, 0–1023, etc. Gray levels are almost always set as non-negative integers. This saves a lot of digital storage space and significantly speeds up image processing. It can be seen that the wider the range of gray levels, the better the resolution.
Since we want to equalize the histogram of the transformed image, let us assume that the gray level of all the pixels in the transformed image has the same number of pixels with intensity level (0,1,2,…, L-1) and is equal to N/L [15]-[17], [19]. Here "N" is the total number of pixels in the image and "L" is the total number of possible intensity levels. We use the notation R represents the features of the original (given) image, and S represents the histogram features of the equalized image. Also, let r_k $(r_k = k;\ k = 0,1,2,\dots,L-1)$ be the original intensity “k”, and let s_k be the intensity corresponding to this “k” (ie, r_k) intensity. As mentioned above, the number of pixels at any image intensity $s_k(\mathrm{k} = 0,1,2,\dots,\mathrm{L}-1)$ is the same and equal to “N/L” for histogram equalization. Thus, we can write the following expression (in terms of the number of image pixels at each intensity level).

$$\sum_{i=0}^{r_k} n_R(i) = \left(\frac{N}{L}\right)(s_k + 1) \ : \ k = 0,1,2,\dots,L-1;\ r_k = k, \qquad (1)$$

Above, "N" is the total number of pixels in the given image, "L" is the total number of possible intensity (gray) levels, *n(i)* is the number of pixels in the image of intensity "i", r_k is the original intensity "k" and s_k is the original intensity The transformed intensity corresponding to "k" (ie, corresponding to r_k). Here, "r" is used to denote the given image and "s" is used to denote the superimposed image.
It should be noted that intensity levels are discrete in digital images (they are integers between 0 and "L-1"). Also, to preserve the "informational integrity" of the image, all image pixels with the same intensity in the original image cannot be assigned different intensities, but can be collectively mapped to the same new value. Therefore, we use the intensity level histogram of the original image pixels $(r_k = k;\ k = 0,1,2,\dots,L-1)$ and we minimize the error (Δ_k) between the equalized histogram $(s_k = k;\ \mathrm{k} = 0,1,2,\dots,\mathrm{L}-1)$ [10],[11]. Of course, in an ideal case, Δ_k is zero. Therefore, we can say that we replace the pixel intensity $(r_k = k;\ k = 0,1,2,\dots,L-1)$ in the given image with the intensity s_k. Thus, Δ_k is minimized using the following equation [9],[10]:

$$\Delta_k = \left| \left(\frac{N}{L}\right)(s_k + 1) - \sum_{i=0}^{r_k} h_R(i) \right| \ : \ r_k = k;\ k = 0,1,2,\dots,L-1, \qquad (2)$$

where, h_R – the pixel value of the image in its initial state.

Taking into account the N/L factor in the above equation, the above minimization can be modified as:

$$\Delta'_k = \left| s_k - \left(\left(\frac{L}{N}\right) \sum_{i=0}^{r_k} h_R(i) - 1 \right) \right| \ : \ r_k = k;\ k = 0,1,2,\dots,L-1, \qquad (3)$$

For a given r_k, s_k can be defined as Taking into account that the above minimization is equal to zero, after turning Δ'_k to zero, solving s_k can be done with the following equation (4):

$$s_k = \left(\frac{L}{N}\right)\sum_{i=0}^{r_k} h_R(i) - 1 \quad : \quad r_k = k;\ k = 0,1,2,\dots,L-1, \tag{4}$$

However, as mentioned above, the value of s_k may consist of real values. Thus, it is appropriate to use equation (5) to ensure that the values of the above expression are integers.

$$s_k = round\left(\left(\frac{L}{N}\right)\sum_{i=0}^{r_k} h_R(i) - 1\right) : r_k = k;\ k = 0,1,2,\dots,L-1, \tag{5}$$

In equation (5), it is observed that the value of s_k is negative when the total number of pixels to be changed is less than "N/2L". Initially, given the intensity level (0,1,2,…, L-1) and the integer number of pixels, we use the following equation (6) to equate $r_k \rightarrow s_k$:

$$\left.\begin{aligned} s'_k &= \left(\frac{L}{N}\right)\sum_{i=0}^{r_k} h_R(i) - 1 \quad : r_k = k;\ k = 0,1,2,\dots,L-1 \\ s_k &= \begin{cases} 0 & : \ s'_k < 0 \\ round(s'_k) & : \ s'_k \ 0 \end{cases} \quad : k = 0,1,2,\dots,L-1 \end{aligned}\right\} \tag{6}$$

In the case where equations (1)-(6) are used, an algorithm was developed to remove noise from colorless images in order to improve the clarity of images using a histogram while keeping the pixel value of the image. Contamination refers to the combination of natural and man-made factors at the time of image capture that can damage the quality of the image. For example, foggy, rainy, cloudy conditions were taken into account. So, by using the histogram, it is possible to clarify the image by looking at the pixel values as color intensities and changing their initial intensity to another intensity.

We develop an algorithm for digital processing of images, and the block diagram of the algorithm is shown in Fig. 2 below.

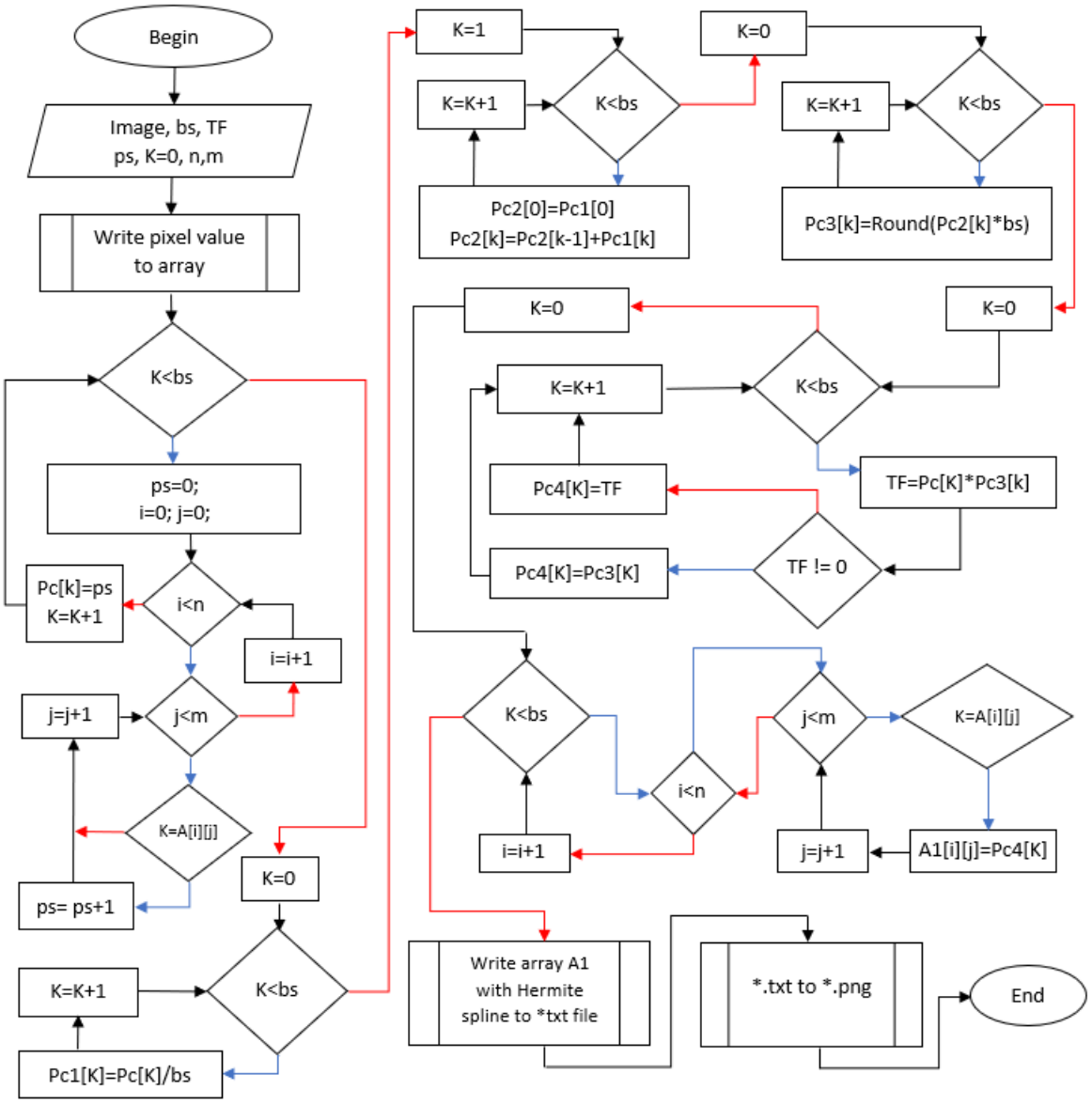

Figure 2. Algorithm for removing noise from images using a histogram methods.

In the algorithm developed above, it was cleared of errors. In order to increase the accuracy of the image. In order to determine the efficiency of the developed algorithm, we take the following

image in JPEG format, which consists of 1600x900 pixels, taken on a cloudy and foggy day, and consider digital processing using the algorithm presented in Figure 2 (Figure 3).

Figure 3. Initial view of the image.

First, we can digitize figure 3 by dividing it into pixels for digital processing. As a result, we have a table equal to 1600x900 (Table 1).

Table 1

The initial digital representation of the image

№	x_1	x_2	x_3	x_4	x_5	x_5	x_6	x_7	…	x_{1600}
y_1	77	78	79	79	78	78	78	77	⋯	90
y_2	76	77	78	78	78	78	79	76	⋯	88
y_3	75	76	78	78	78	78	79	75	⋯	88
y_4	75	77	78	79	79	79	80	75	⋯	88
y_5	75	76	78	78	78	78	79	75	⋯	90
y_6	75	77	78	78	78	78	79	75	⋯	93
y_7	76	77	78	79	78	78	79	76	⋯	99
y_8	75	75	74	74	75	76	76	75	⋯	101
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
y_{900}	77	78	77	77	78	77	77	78	…	76

Using the considered algorithm, we first change the pixel intensity of the image presented in Table 1. (Fig. 4).

Figure 4. The result of numerical processing using the developed algorithm.

We put the digital representation of the image in Table 2 to clarify the numerical performance results using the algorithm presented in Figure 2.

Table 2.

№	x_1	x_2	x_3	x_4	x_5	x_5	x_6	x_7	…	x_{1600}
y_1	12	16	20	20	16	16	16	20	…	57
y_2	7	12	16	16	16	16	20	20	…	52
y_3	5	7	16	16	16	16	20	24	…	52
y_4	5	12	16	20	20	20	24	27	…	52
y_5	5	7	16	16	16	16	20	24	…	57
y_6	7	12	16	20	16	16	20	20	…	65
y_7	5	5	4	4	5	7	7	12	…	81
y_8	5	5	5	4	5	7	7	12	…	86
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
y_{900}	12	16	12	12	16	12	12	16	…	7

From Figure 4, we can see that by changing the intensity of the gray level using the histogram, the number of pixels from the original state of the image and we have achieved an improvement in the quality of the image. We analyze the changes in the initial and final images. The initial color intensity value of the image is RV, and the intensity value obtained by the proposed algorithm is DV (Table 3).

Table 3

Analysis of image color intensities

№	0	1	2	3	4	5	6	7	8	9	10	…
RV	77	76	75	78	90	80	101	88	79	74	99	…
DV	12	7	5	16	57	24	86	52	20	4	81	…

Looking at the table, it can be seen that the original pixel value has changed significantly. Color intensity is close to black when the pixel value is high, and close to white when it is close to 0. The results show that our proposed algorithm is effective in improving image resolution.

Conclution.

The colorless images in the JPEG format were cleaned of image distortions using our proposed algorithm. First, the intensity of the gray level was changed using a histogram. In order to increase the accuracy of the image, the number of pixels has been increased. As a result, the resolution of the image was equal to 1600x900. The initial size of the image was 472 Kbytes, and as a result of digital processing it was equal to 1,15 Mbytes. Increasing the resolution of the image caused it to take up more than 2 times the size of the hard disk. In the process of diagnosing diseases with colorless images in medicine, when medical images contain various noises and distortions due to technical malfunctions, experts make it difficult to make a correct diagnosis of the disease. In such cases, the use of the proposed algorithm developed during the research shows that it is effective.

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Linguistic, Cultural, and Pragmatic Challenges in Translating Idiomatic Expressions from English to Uzbek

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Introduction

Idioms are figurative expressions that reflect the worldview, values, and communicative traditions of a language community. Unlike literal language, idioms resist direct translation due to their metaphorical meaning and context-specific functions. In both English and Uzbek, idioms play a significant role in daily communication, literature, and media. However, translating them requires more than lexical substitution — it demands sensitivity to linguistic, cultural, and pragmatic dimensions.

This research explores the challenges encountered in translating English idiomatic expressions into Uzbek. It highlights three major problem areas: linguistic (structural and grammatical), cultural (beliefs, customs, and worldviews), and pragmatic (intended function, tone, and context). The goal is to identify patterns in how idioms behave across languages and recommend translation strategies suitable for Uzbek translators working with English texts.

Methodology

This research employs a **qualitative-descriptive method** using **comparative analysis** and **case-based examples**, which is common in translation studies (Baker, 2018; Larson, 1998). The study follows these steps:

1. **Idiomatic Sample Selection**: Twenty idioms were selected from widely used English idiomatic dictionaries (e.g., *Oxford Dictionary of Idioms*) and literary texts.
2. **Uzbek Translations Analyzed**: Their existing or potential Uzbek equivalents were reviewed in both published translations and unofficial media subtitles.
3. **Categorization**: Challenges were classified into three main domains — linguistic, cultural, and pragmatic — following theoretical frameworks proposed by Baker (2018) and Nida and Taber (2003).
4. **Translation Strategy Evaluation**: Each idiom was analyzed in terms of the strategy used: literal translation, substitution, paraphrasing, or omission (Newmark, 1988).
5. **Text Types**: Both literary texts (e.g., *Animal Farm*) and audiovisual materials (e.g., Netflix subtitle translations) were analyzed to illustrate domain-specific challenges.

Results

Linguistic Challenges

English idioms often follow a verb-object structure, while Uzbek, being an agglutinative language, uses suffixation to show grammatical relationships (Larson, 1998). For example, “bite the bullet” cannot be directly mirrored in Uzbek syntax without distorting meaning. According to Newmark (1988), when syntactic equivalence is lacking, reformulation is required, yet this may dilute stylistic effect.

Uzbek idioms also tend to be more image-based and metaphorical. A literal translation like “don’t cry over spilled milk” as *to‘kilgan sut uchun yig‘lama* fails to resonate culturally or linguistically. Instead, the Uzbek idiom *O‘tgan ishga salovat* carries similar pragmatic meaning but is grammatically and culturally native.

Cultural Challenges

Many idioms in English stem from Christianity, Greek mythology, or Western traditions. For instance, “Achilles’ heel” references Greek mythology and requires contextual knowledge not common among Uzbek speakers (Vinay & Darbelnet, 1995). A literal translation offers little

meaning without cultural explanation. As Nida and Taber (2003) argue, cultural equivalence often outweighs lexical accuracy in translation.

Similarly, “bring home the bacon” involves food and lifestyle associations unfamiliar or inappropriate in Muslim-majority Uzbek society. A more suitable equivalent would be *non topib kelmoq*, which aligns with Uzbek culture and conveys the intended meaning of earning a living (Baker, 2018).

Pragmatic Challenges

Idioms often carry specific **pragmatic functions**, such as signaling politeness, sarcasm, or exaggeration. The English idiom “break the ice,” for example, functions as a metaphor for initiating social interaction. Translating it literally into Uzbek does not convey its idiomatic nuance. According to Fernando (1996), the pragmatics of idioms must be evaluated alongside their semantic and syntactic components.

Tone and register also differ significantly. For example, “burning the midnight oil” may be translated as *kechasi bilan o‘qimoq*, but this translation lacks the poetic imagery. As Newmark (1988) notes, idioms often serve an expressive or rhetorical purpose, and a loss in tone may diminish their communicative effect.

Discussion

The challenges identified reinforce the view that idiomatic translation is a **multidimensional process** requiring both linguistic competence and cultural literacy. Baker’s (2018) strategies — using idioms of similar meaning and/or form, paraphrasing, or omission — were frequently observed across both literary and media texts.

In culturally sensitive contexts, translators tend to **domesticate** idioms — that is, they replace them with expressions familiar to the Uzbek audience (Venuti, as cited in Baker, 2018). For instance, the idiom “when pigs fly” is best translated as *tovuq tishlaganda*, which maintains the function (impossibility) but changes the metaphor.

In literary translation (e.g., Orwell’s *Animal Farm*), translators often opt for paraphrasing or functional equivalence to maintain narrative clarity. In contrast, film subtitle translators sometimes omit idioms due to time and space constraints, a practice also discussed by Larson (1998) as a trade-off between brevity and semantic richness.

These findings suggest that translator training in Uzbekistan should emphasize idiomatic competence and the importance of **contextual meaning**, not just vocabulary knowledge. This is particularly important in professional domains like diplomatic translation, literature, and audiovisual localization.

Conclusion

Translating idiomatic expressions from English to Uzbek presents linguistic, cultural, and pragmatic challenges that demand more than word-for-word equivalence. Because idioms are fixed expressions with figurative meanings, direct translation often results in confusion or loss of meaning.

This study shows that strategies like substitution with a culturally similar idiom, paraphrasing, and, in some cases, omission can be effective, depending on context and purpose. The translator's role is to balance fidelity to the source with accessibility and resonance for the target audience (Baker, 2018; Nida & Taber, 2003).

Further research could examine the translation of Uzbek idioms into English or the teaching of idiomatic expressions in bilingual classrooms. Ultimately, mastering idiomatic translation is key to effective cross-cultural communication.

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Extra-Class Work In Primary Grades On The Example Of A Mathematics Lesson

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Abstract
This article discusses the role and importance of extracurricular activities in the formation of knowledge, skills and competencies in mathematics among primary school students. The possibilities of increasing students' interest in science through extracurricular activities, teaching them to conduct independent research, as well as developing problem-solving skills within the subject are considered.
Keywords: primary school, extracurricular activities, mathematics lesson, interest, independent research, creative activity.

Introduction: Today, special attention is paid to the formation of students' independent thinking and practical skills in the education system. In particular, in teaching mathematics in primary schools, it is important to develop children's aspirations for in-depth knowledge of the subject, not limited to the lesson process, but through the organization of extracurricular activities. Extracurricular activities serve as an important tool for increasing students' ability to think freely and creatively, and for developing independent research, resourcefulness and mathematical thinking in them. At the same time, they allow you to deepen the concepts that were not sufficiently mastered during the lesson, to consolidate them through additional exercises. Therefore, the issue of the correct and effective organization of extracurricular activities remains relevant today.

Main part: The main goal of organizing extracurricular activities in mathematics in primary grades is to form deep and solid knowledge of the subject among students, to arouse interest, and to encourage creative activity. These forms of activity include mathematical circles, science weeks, competitions, quizzes, intellectual games, and Olympiads.

For example, extracurricular activities such as the “Inventors' Competition” or the “Mathematical Relay Race” serve to consolidate students' knowledge in an interesting way. In such activities, children, along with solving simple examples and problems, work on logical puzzles and mathematical riddles. As a result, their mathematical thinking, speech, and thinking speed develop. At the same time, mutual assistance, competition, and a friendly atmosphere are formed through teamwork.

A common problem in practice is that extracurricular activities are sometimes limited to repeating the topics of the lesson. This leads to their failure to fully fulfill their task of directing students to creative and free thinking. Therefore, it is important to use innovative methods, modern interactive tools, and the introduction of IT technologies in extracurricular activities. For example, organizing online quizzes, quizzes, and interactive tests in mathematics will further increase children's interest.

Also, connecting extracurricular activities with family events - holding math evenings with the participation of parents, family competitions - can help form a positive attitude towards science in students. Such events involve not only the student, but also his family in the educational process.

Purposeful and systematically organized extracurricular activities help the student to express himself, reveal his hidden talents, and develop as a socially active person. In this regard, extracurricular activities within the framework of mathematics serve as an important means of increasing educational effectiveness.

Conclusion: In conclusion, the effective organization of extracurricular activities in mathematics in primary grades serves not only to consolidate students' knowledge, but also to develop their creative and free thinking skills, and to increase their interest in science. In this process, innovative methods, interactive games, the use of modern technologies, and the involvement of parents are of great importance. As a problem, it can be noted that in some cases extracurricular activities are seen only as a means of repeating the lesson. This limits the opportunities for students to develop independent and creative thinking. As a solution, it is proposed to introduce new forms and methods to make extracurricular activities a more interesting, interactive and creative process. At the same time, it is also relevant to increase the methodological capacity of teachers and organize special seminars and trainings for them.

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Sustainable Development Goals – A Factor For The Sustainable Development Of Individuals, Society, And The Country

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Abstract
The Sustainable Development Goals (SDGs) represent a universal call to action to end poverty, protect the planet, and ensure prosperity for all by 2030. This paper explores the role of the SDGs as a catalyst for sustainable development across individuals, society, and nations. By addressing critical issues such as inequality, environmental degradation, and economic instability, the SDGs provide a framework for transformative change. The study highlights practical applications, challenges, and policy recommendations to align local and global efforts toward achieving these goals.
Keywords: Sustainable Development Goals, sustainable development, global progress, economic stability, environmental protection, social equity, transformative policies

Introduction

Sustainable development is essential for ensuring the long-term well-being of humanity and the planet. The United Nations Sustainable Development Goals (SDGs), adopted in 2015, offer a roadmap for achieving this vision by integrating economic growth, social inclusion, and environmental sustainability. This paper investigates the pivotal role of the SDGs in addressing contemporary challenges such as climate change, poverty, and inequality while fostering a more equitable and sustainable global society. Special emphasis is placed on the practical implications of the SDGs for individuals, communities, and national policies.

Main Body

The SDGs encompass 17 goals and 169 targets, addressing a broad spectrum of issues, from eradicating hunger to promoting quality education and clean energy. However, achieving these ambitious targets requires coordinated efforts among governments, private sectors, and civil societies. This study evaluates the significance of the SDGs in shaping sustainable development strategies and identifies the critical challenges hindering their implementation.

1. The Importance of the SDGs in Addressing Global Challenges The SDGs address the interconnected nature of global challenges. For instance, climate action (Goal 13) is closely linked to goals related to sustainable cities (Goal 11), responsible consumption and production (Goal 12), and life below water (Goal 14). By providing an integrated framework, the SDGs enable stakeholders to tackle complex issues comprehensively.

- **Economic Growth and Poverty Alleviation** Goal 1, "No Poverty," underscores the importance of eradicating poverty in all its forms. Sustainable economic growth, as outlined in Goal 8, is critical for creating jobs and improving living standards. Developing countries, in particular, need robust financial and technological support to achieve these objectives.
- **Social Equity and Inclusion** Goals focusing on quality education (Goal 4), gender equality (Goal 5), and reduced inequalities (Goal 10) highlight the need for inclusive development. Promoting equal opportunities ensures that no one is left behind, a fundamental principle of the SDGs.
- **Environmental Sustainability** Environmental goals, including clean water and sanitation (Goal 6) and climate action (Goal 13), emphasize the need to protect natural resources and mitigate the adverse effects of climate change. Sustainable practices in agriculture, energy, and industry are essential to achieving these targets.

2. Challenges in Implementing the SDGs Despite the comprehensive framework of the SDGs, several challenges hinder their implementation:

- **Financial Constraints** Many developing countries lack the financial resources to invest in sustainable development initiatives. Bridging this gap requires international cooperation and innovative financing mechanisms.
- **Policy and Governance Gaps** Weak governance structures and inconsistent policies often undermine efforts to achieve the SDGs. Strengthening institutional capacity and fostering accountability are critical for effective implementation.
- **Data and Monitoring** Accurate and timely data are essential for tracking progress and identifying areas for improvement. Many countries face challenges in collecting and analyzing data related to the SDGs.
- **Public Awareness and Engagement** Achieving the SDGs requires active participation from all segments of society. However, limited awareness and engagement often impede progress at the grassroots level.

3. Case Studies and Best Practices Examining successful initiatives provides valuable insights into the practical implementation of the SDGs:

- **Renewable Energy in Costa Rica** Costa Rica has achieved significant progress in renewable energy, with over 99% of its electricity coming from renewable sources. This aligns with Goal 7 (Affordable and Clean Energy) and demonstrates the feasibility of sustainable energy transitions.
- **Educational Reforms in Finland** Finland's emphasis on equitable and high-quality education (Goal 4) serves as a model for other nations. The country's student-centered approach and focus on lifelong learning have contributed to its success.
- **Social Protection in Brazil** Brazil's Bolsa Família program addresses poverty and inequality by providing conditional cash transfers to low-income families. This initiative supports multiple SDGs, including Goals 1 and 10.

4. Policy Recommendations for Advancing the SDGs To accelerate progress toward the SDGs, stakeholders must adopt a multi-pronged approach:

- **Strengthening Partnerships** Collaboration among governments, private sectors, and civil societies is essential. Public-private partnerships can mobilize resources and expertise to address specific challenges.
- **Enhancing Education and Awareness** Promoting education and awareness about the SDGs can foster community engagement and drive grassroots initiatives. Integrating the SDGs into school curricula can build a culture of sustainability among future generations.
- **Leveraging Technology and Innovation** Technological advancements can significantly enhance efforts to achieve the SDGs. For example, digital platforms can improve data collection, monitoring, and service delivery.
- **Fostering Policy Coherence** Ensuring alignment between national policies and SDG targets is critical for achieving sustainable outcomes. Governments must adopt integrated approaches to policy development and implementation.

Conclusion The Sustainable Development Goals provide a comprehensive blueprint for addressing the pressing challenges of our time. By fostering economic growth, social equity, and environmental sustainability, the SDGs hold the potential to transform societies and create a more resilient future. However, realizing this vision requires overcoming significant challenges and leveraging the collective efforts of all stakeholders. Through innovative strategies, collaborative partnerships, and sustained commitment, the SDGs can serve as a powerful catalyst for sustainable development at all levels.

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Specific Features Of The Fourth Grade Mathematics Textbook

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Abstract
This article highlights the specific features of the fourth-grade mathematics textbook. The importance of mathematics in primary education, especially its role in developing students' knowledge, skills and competencies at the fourth grade level, is substantiated.
Keywords: mathematics textbook, didactics, method, class, student, modern lesson.

The resolution of the President of the Republic of Uzbekistan Shavkat Mirziyoyev No. PQ-4708 dated May 7, 2020 is entitled "On measures to improve the quality of education and develop scientific research in the field of mathematics". This document includes a wide range of measures aimed at developing mathematical education and science in our country.
The role of mathematics in the primary education system is incomparable. Especially in the fourth grade, this subject further strengthens students' logical thinking, problem-solving skills, and ability to work with numbers. In this regard, the fourth grade mathematics textbook has its own didactic, methodological, and content-specific characteristics, and serves as an important tool in the formation of students as independent thinkers at the next stage.
The main features of the fourth grade mathematics textbook can be considered in the following areas:
1. Systematicity and consistency of content: In the textbook, students acquire new knowledge based on previously learned knowledge. Each topic is given in an inextricable link with previous topics. This forms a holistic picture of mathematical concepts in students.
2. Practical orientation: The tasks in the textbook are based on real-life examples. Through topics such as market prices, time, distance, and units of measurement, students acquire knowledge close to life.
3. Problematic and logical tasks: In order to expand the scope of students' thinking, the textbook also includes problematic tasks, logical problems, and interesting questions. This helps students develop the skills of consistent thinking, understanding cause-and-effect relationships, and drawing conclusions.
4. Variety of didactic materials: Topics are covered in a more understandable and interesting way through pictures, diagrams, tables, and visual aids. This allows for interactive teaching.
5. Differential approach: The textbook provides tasks of different levels, which helps to take into account the individual capabilities of students. There are separate tasks for strong and weak learners.
6. Integration with new technologies: In some subjects, the use of information technologies in the lesson is recommended. This allows the lesson to be modern and interesting.
1. Development of mathematical knowledge
In the fourth grade, students enter the main stage of learning mathematics. During this period, they perfect simple arithmetic operations (addition, subtraction, multiplication, division). By solving logical problems, students understand the basic laws of mathematics. For example:
• Strengthening addition and subtraction: Students learn to apply addition and subtraction operations in practice through various problems.
• Developing multiplication and division: They master multiplication and division well with the help of logical questions.
Example: "If we divide 7 pencils equally between 3 children, how many pencils will each child have?" - such questions help students strengthen their division operations.
2. Developing logical thinking and reasoning

Students develop logical thinking when solving mathematical problems. Each problem or task encourages the student to imagine and think. At this stage, students learn to look for ways to solve problems and consider different options, while consolidating their knowledge.

• Problem analysis: Students learn different approaches to solving mathematical problems. For example, solving a problem in two different ways, seeing the difference, and thinking.

• Imagining: For example, "If there are 6 apples, and each child gets 2 apples, how many children will get apples in total?" - such questions encourage students to imagine the content.

3. Strengthening skills and improving qualifications

In the fourth grade, students not only acquire knowledge, but also have the opportunity to strengthen their skills and improve their qualifications.

Solving mathematical problems and tasks develops not only intellectual, but also practical skills for them. For example:

• Quick and accurate problem solving: Students learn to find timely and accurate solutions. This will help them make quick and effective decisions in other areas in the future.

• Independent work: Students develop independent work skills when solving problems. This, in turn, will help them develop independent learning skills in other areas of education.

Example: "If 5 candies are distributed among 3 children, how many candies will each child get and how many candies will remain?" - these types of problems help students develop division, remainders, and imagination.

4. Developing creative and critical thinking

Mathematics tasks develop students' creative and critical thinking skills. When solving problems, students look for not just one solution, but different solutions. This, in turn, strengthens their creative approaches.

• Creative Thinking: Students develop new methods and seek new approaches to solving problems.

• Critical Thinking: Students learn to identify errors and check the correctness of the solution when solving a problem correctly.

Problematic Tasks

Task 1: Books in a Box

There are 15 books in a box. If 8 more books are added to this box, how many books will there be in total? Find the number of books.

Task 2: Apples and Bananas

There are 12 apples and 9 bananas in a store. If 4 more apples and 6 bananas are added, how many fruits will there be in total?

Task 3: Letters and Numbers

There are 3 letters "A" and 5 letters "B" written on a piece of paper. If 2 more "A" letters and 4 "B" letters are added, how many letters will there be in total? Why do you think these letters are written together?

Logical tasks

Task 1: Books and students

There are 20 students in a class. Each student needs to be given 2 books. How many books are needed in total to give books to all students?

Task 2: Tables in the house

There are 5 tables in a house. Each table has 4 books. Calculate the total number of books.

Task 3: Girls and boys

There are 24 students in a class. 14 of them are girls, the rest are boys. Find the number of boys.

Working and Imagination

Task 1: Number Sequence

Continue the following number sequence:

3, 6, 9, 12, __, __, __

Task 2: Ordinal Numbers
2, 4, 8, 16, __, __, __
Task 3: Small and Large Numbers
Find the smallest and largest of the following numbers:
45, 62, 31, 89, 79
In conclusion, the fourth-grade mathematics textbook, due to its systematic content, practical orientation, variety of didactic materials, and enrichment with problem tasks, plays an important role in the in-depth and effective teaching of mathematics in primary education.

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Sustainable Development Goals – A Factor For The Sustainable Development Of Individuals, Society, And The Country

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Abstract
The Sustainable Development Goals (SDGs) have emerged as a critical framework for addressing contemporary global challenges. This thesis examines the role of SDGs in enhancing the sustainable development of individuals, society, and nations. By prioritizing urgent issues such as climate change, poverty alleviation, and social equity, the SDGs foster a holistic approach to progress. The study highlights key interventions, strategies, and collaborative efforts that align with the SDGs to drive meaningful outcomes for humanity and the planet.
Keywords: Sustainable Development Goals, sustainability, climate action, global collaboration, poverty eradication, social equity, transformative policies
Introduction Sustainability has become a cornerstone of global development initiatives, underpinned by the United Nations' Sustainable Development Goals (SDGs) adopted in 2015. These 17 interconnected goals aim to address pressing global issues ranging from environmental degradation to social inequality, fostering a balanced approach to economic, social, and environmental progress.
The relevance of the SDGs lies in their universal applicability and their capacity to adapt to the specific needs of diverse regions and communities. For individuals, the SDGs promote access to quality education, healthcare, and economic opportunities. For societies, they provide a framework for reducing inequalities and fostering social cohesion. For nations, the SDGs serve as a guiding principle for sustainable policies and international collaboration.
This thesis delves into the transformative impact of the SDGs and explores practical pathways to integrate these goals into the fabric of individual, societal, and national development efforts.
Main Body
1. The Role of SDGs in Individual Development The SDGs place significant emphasis on improving individual well-being through access to basic needs, education, and opportunities.

- **Health and Well-Being (Goal 3)** Health is fundamental to personal development. Goal 3 aims to ensure healthy lives and promote well-being for all ages. Programs focusing on maternal health, vaccination, and mental health services contribute directly to enhancing individual capabilities.
- **Quality Education (Goal 4)** Education is a cornerstone for empowering individuals. Goal 4 emphasizes inclusive and equitable quality education, enabling people to develop skills and knowledge essential for sustainable livelihoods.
- **Decent Work and Economic Growth (Goal 8)** Economic empowerment is crucial for individual growth. By promoting sustainable economic policies and creating job opportunities, Goal 8 facilitates personal financial stability and productivity.

2. Societal Transformation through SDGs Societies benefit significantly from the adoption of SDG-driven frameworks, which foster inclusivity, resilience, and sustainability.

- **Gender Equality (Goal 5)** Achieving gender equality enhances social harmony and maximizes human potential. Policies promoting equal pay, representation, and protection against discrimination contribute to societal progress.
- **Sustainable Communities (Goal 11)** Urbanization and infrastructure development are key to societal growth. Goal 11 aims to create safe, inclusive, and resilient communities, emphasizing affordable housing, sustainable transport, and disaster risk reduction.

- **Reduced Inequalities (Goal 10)** Addressing disparities within and among countries fosters more cohesive societies. Redistribution policies and social safety nets help bridge income gaps and ensure equitable access to resources.

3. National Development Aligned with SDGs Nations that integrate SDG principles into their policies can achieve long-term stability and prosperity.

- **Climate Action (Goal 13)** Climate change poses a significant threat to national development. Goal 13 calls for urgent action to combat climate impacts through renewable energy adoption, emission reductions, and conservation initiatives.
- **Responsible Consumption and Production (Goal 12)** Sustainable economic practices ensure the efficient use of natural resources. Nations can adopt circular economy models to minimize waste and maximize resource utilization.
- **Global Partnerships (Goal 17)** Collaboration is key to achieving the SDGs. Goal 17 encourages international cooperation, technology transfer, and capacity-building efforts to accelerate progress.

4. Challenges and Strategies for Achieving the SDGs

- **Financial Barriers** Insufficient funding is a major obstacle. Governments and private sectors must collaborate to mobilize resources through innovative financing mechanisms, such as green bonds and public-private partnerships.
- **Data and Monitoring Gaps** Accurate data is essential for tracking progress. Nations must invest in robust data collection systems and leverage technology for real-time monitoring.
- **Policy Integration** The success of the SDGs depends on integrating them into national and local policies. Governments should align their development agendas with SDG targets and ensure policy coherence.

Case Studies

- **Denmark's Green Energy Transition** Denmark's commitment to renewable energy, particularly wind power, exemplifies Goal 7 (Affordable and Clean Energy). The country's policies have significantly reduced its carbon footprint while boosting economic growth.
- **India's Sanitation Campaign** India's Swachh Bharat Abhiyan (Clean India Mission) aligns with Goal 6 (Clean Water and Sanitation). By constructing millions of toilets and promoting hygiene awareness, the initiative has improved public health outcomes.
- **Norway's Gender Equality Policies** Norway's success in achieving gender parity, particularly in political representation and workforce participation, reflects its commitment to Goal 5 (Gender Equality).

Policy Recommendations

1. **Strengthen Multi-Stakeholder Engagement** Encourage partnerships among governments, businesses, academia, and civil societies to pool resources and expertise.
2. **Invest in Education and Awareness** Raise public awareness about the SDGs and their relevance to daily life through educational campaigns and community initiatives.
3. **Promote Sustainable Technologies** Adopt innovative technologies to address challenges in energy, agriculture, and urban development.
4. **Enhance Policy Coherence** Ensure that national and local policies are aligned with SDG priorities to avoid conflicting agendas.

Conclusion The Sustainable Development Goals provide a robust framework for addressing critical global challenges. By prioritizing health, education, equity, and environmental sustainability, the SDGs pave the way for transformative change. However, achieving these ambitious targets requires overcoming barriers through collaborative efforts, innovative strategies, and sustained commitment. With collective action, the SDGs can serve as a powerful catalyst for sustainable development at individual, societal, and national levels.

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Enhancing English Lessons with National Online Resources for Secondary School Students

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Abstract
The effective organization of English lessons for secondary school students increasingly depends on the use of modern educational resources that align with students' needs and curriculum standards. This paper explores how national online platforms, specifically designed to complement the official English textbooks for grades 7 and 8, help teachers diversify lessons and support students' independent learning.
Keywords: English lessons, online resources, Prepare.uz, secondary school, textbook-based learning.

1. Introduction
In Uzbekistan, special attention is paid to creating accessible online educational platforms that correspond with state-approved textbooks. One such platform, created and authored by the researcher, is the Prepare.uz portal, which offers interactive exercises, listening tasks, and additional materials directly connected to the content of the English textbooks for 7th and 8th grades. The increasing demand for flexible and engaging learning resources has made the integration of such platforms an important part of language education.

2. Methods
This thesis is based on classroom observations, informal interviews with English teachers, and a review of the Prepare.uz platform's structure and functions. Teachers shared their practical experiences of using the platform with students in grades 7 and 8, while observations focused on how students interact with online tasks and follow the sequence of textbook-based exercises.

3. Results
Observation and feedback show that the use of Prepare.uz improves lesson variety and student motivation. Teachers report that students complete tasks more actively when online materials follow textbook units. Many students also use the platform for self-study and homework, which supports continuous language practice outside the classroom. However, some schools face challenges such as limited internet access and lack of teacher training for organizing online tasks efficiently.

4. Discussion
The results highlight the importance of providing teachers with technical and methodological support to fully benefit from platforms like Prepare.uz. Continuous teacher training, improved internet infrastructure, and clear guidance on lesson planning with online tools can help maximize the platform's potential. Aligning online resources directly with textbook content makes it easier for both teachers and students to follow the curriculum while introducing interactive elements that traditional lessons may lack.

5. Conclusion
Integrating national online platforms with official textbooks is a practical solution for improving English lessons in secondary schools. With proper training and stable technical conditions, teachers can better organize blended learning and motivate students to develop language skills both in class and at home. The Prepare.uz platform shows how locally developed digital resources can strengthen the quality of English teaching in Uzbekistan.

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A Component Of Sustainable Development For People And Society Is The Sustainable Development Goal

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Abstract
The Sustainable Development Goals (SDGs) represent a transformative agenda aimed at addressing the world's most pressing challenges. This thesis examines the evolution of global development efforts, highlighting the historical context of the SDGs and their contemporary relevance. By comparing past and present approaches to sustainability, the paper underscores the advancements made, persistent gaps, and the pivotal role of international cooperation. It explores initiatives that have reshaped policies and societal attitudes, making the SDGs a cornerstone for future progress. Ultimately, the study reveals the enduring necessity of sustainable development for global prosperity.
Keywords: Sustainable Development Goals, historical context, contemporary relevance, global progress, sustainability, international cooperation, development policies, challenges, resilience, societal transformation.

Introduction

The concept of sustainable development has deep historical roots, tracing back to the global realization of finite resources and the need for balanced growth. However, it was the 1987 Brundtland Report, *Our Common Future*, that brought the term to prominence, defining sustainable development as meeting the needs of the present without compromising future generations. The adoption of the Millennium Development Goals (MDGs) in 2000 marked a significant milestone, setting the stage for the broader and more ambitious Sustainable Development Goals (SDGs) in 2015. This paper examines the relevance of the SDGs by analyzing the past and present approaches to development, exploring the progress made, and identifying areas requiring continued focus.

Main Body

1. Historical Context of Sustainable Development The journey toward sustainable development began with a growing awareness of environmental degradation during the mid-20th century. Events such as the publication of *Silent Spring* by Rachel Carson in 1962 and the establishment of Earth Day in 1970 reflected a global awakening to environmental concerns. These movements catalyzed international efforts, including the 1972 Stockholm Conference on the Human Environment, which laid the groundwork for environmental protection in development policies.

The MDGs, launched in 2000, were the first globally coordinated development framework, targeting critical issues such as poverty reduction, education, and health. While successful in many areas, the MDGs faced criticism for being too narrow and failing to address systemic inequalities and environmental sustainability. These shortcomings paved the way for the more comprehensive and inclusive SDGs.

2. Contemporary Relevance of the SDGs The SDGs emerged as a response to the evolving and interconnected challenges of the 21st century. Unlike the MDGs, the SDGs adopt a holistic approach, addressing economic, social, and environmental dimensions of development. Their relevance today is underscored by pressing global issues such as climate change, biodiversity loss, and socioeconomic inequalities.

The COVID-19 pandemic further emphasized the importance of resilience and sustainability. As countries grappled with healthcare crises and economic disruptions, the SDGs provided a guiding framework for recovery. For instance, SDG 3 (Good Health and Well-being) and SDG

8 (Decent Work and Economic Growth) gained renewed importance as governments prioritized public health systems and economic resilience.

3. Comparing Past and Present Approaches While historical efforts laid the foundation for sustainable development, contemporary approaches offer a broader and more integrated vision:

- **Scope:** The MDGs focused on developing countries, whereas the SDGs are universal, applicable to all nations regardless of their economic status.
- **Inclusivity:** The SDGs emphasize inclusivity, addressing systemic inequalities related to gender, race, and economic disparity.
- **Environmental Focus:** Early efforts were predominantly anthropocentric, whereas the SDGs emphasize ecological sustainability alongside human development.
- **Technology and Innovation:** Advances in technology have transformed the means of achieving sustainability. Digital tools, renewable energy technologies, and data analytics play a pivotal role in SDG implementation today.

4. Efforts within the Scope of SDGs Numerous initiatives highlight progress under the SDG framework:

- **Global Climate Agreements:** The Paris Agreement of 2015 aligns closely with SDG 13 (Climate Action), fostering international commitments to reduce greenhouse gas emissions.
- **Education Initiatives:** Programs like UNESCO's Global Action Programme on Education for Sustainable Development advance SDG 4 (Quality Education).
- **Corporate Social Responsibility (CSR):** Companies increasingly adopt sustainability practices, integrating SDG priorities into their operations.
- **Community-led Efforts:** Grassroots movements focus on SDG goals such as clean water access (SDG 6) and sustainable agriculture (SDG 2), demonstrating the power of local actions.

5. Persistent Challenges and Opportunities Despite notable progress, significant challenges remain:

- **Inequalities:** Gender, income, and geographic disparities continue to hinder equitable progress.
- **Climate Change:** Rising temperatures and extreme weather events threaten to reverse development gains.
- **Funding Gaps:** Achieving the SDGs requires substantial financial investment, often lacking in low-income countries.
- **Political Will:** Sustained commitment from governments and institutions is critical but inconsistent.

Opportunities for advancement include fostering innovative financing mechanisms, strengthening international cooperation, and leveraging public awareness to drive grassroots movements. The SDGs' integrated framework ensures that efforts in one area contribute to progress across others, amplifying their impact.

Conclusion

The Sustainable Development Goals reflect both the lessons of history and the aspirations of the present. By addressing past shortcomings and embracing contemporary challenges, the SDGs offer a robust pathway toward global sustainability. Their relevance lies not only in their ambitious targets but also in their ability to unite diverse stakeholders in pursuit of a shared vision. As the global community strives to meet these goals, the SDGs remain a powerful testament to humanity's collective commitment to a sustainable future.

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Goals for Sustainable Development: An Elements of Sustainable Development for People, Society, and the Nation

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Abstract
The Sustainable Development Goals (SDGs) serve as a universal framework for addressing global challenges such as poverty, inequality, climate change, and education. By integrating these goals into national policies, countries can promote holistic growth that balances economic development, social inclusion, and environmental sustainability. This paper explores the significance of SDGs in fostering sustainable development for individuals, communities, and nations. It highlights key challenges, potential solutions, and practical measures to accelerate progress toward achieving these objectives. Ultimately, the SDGs represent a roadmap for building a more equitable and resilient global society.
Keywords: Sustainable Development Goals, human development, social progress, economic growth, environmental sustainability, global challenges, policy integration, community resilience, equity, education.

Introduction

The Sustainable Development Goals (SDGs), adopted by the United Nations in 2015, comprise 17 interconnected objectives aimed at eradicating poverty, reducing inequality, and safeguarding the planet by 2030. These goals provide a comprehensive blueprint for achieving sustainable development at all levels—individual, societal, and national. With rapid globalization and pressing environmental challenges, the SDGs emphasize collective responsibility and innovative approaches to ensure long-term stability and prosperity. This paper delves into the role of SDGs as catalysts for sustainable growth, addressing critical challenges and outlining strategies to achieve these transformative objectives.

Main Body

1. Importance of Sustainable Development Goals 1. Importance of Sustainable Development Goals The Sustainable Development Goals represent a unified global effort to tackle critical issues affecting humanity and the planet. They are transformative in nature, aiming to bridge the gap between economic growth, social equity, and environmental protection, thereby fostering a more balanced and inclusive world.

For individuals, the SDGs ensure access to fundamental human rights such as quality education, healthcare, clean water, and gender equality. They empower people to achieve their potential by addressing systemic barriers and creating opportunities for lifelong learning, decent work, and good health. The SDGs also emphasize the importance of eradicating extreme poverty and hunger, which are fundamental to enhancing quality of life and individual dignity.

At the societal level, these goals foster social cohesion and resilience by addressing inequalities and promoting inclusive policies. By advocating for reduced disparities in income, access to services, and participation in decision-making processes, the SDGs strengthen communities and encourage equitable development. The focus on social justice helps build trust and collaboration among diverse groups, fostering a culture of mutual respect and shared responsibility.

Nationally, the SDGs encourage governments to adopt sustainable practices that align with global standards, enhancing their international standing and long-term development prospects. By integrating the goals into national development plans, countries can create robust frameworks for progress that balance economic growth with environmental stewardship. For

instance, sustainable urbanization policies can improve infrastructure, reduce carbon footprints, and promote green technologies, thereby enhancing national productivity and global competitiveness.

Moreover, the SDGs underscore the interconnectedness of global challenges. Achieving one goal often accelerates progress in others. For example, improving education (SDG 4) has a direct impact on gender equality (SDG 5), economic growth (SDG 8), and innovation (SDG 9). This interlinked approach ensures that efforts in one domain create positive ripple effects across various sectors.

To maximize their impact, the SDGs call for collaboration among stakeholders—governments, businesses, civil society, and individuals. These partnerships can pool resources, knowledge, and expertise to address systemic challenges more effectively. Ultimately, the SDGs serve as a guiding framework for transformative change that benefits people, societies, and nations alike, ensuring no one is left behind.

2. Key Challenges in Achieving SDGs Despite widespread adoption, numerous obstacles hinder the implementation of SDGs:

- **Economic Disparities:** Unequal resource distribution and economic instability create barriers to achieving inclusive growth.
- **Climate Change:** Environmental degradation and climate crises exacerbate vulnerabilities, particularly for developing nations.
- **Political Instability:** Weak governance and corruption impede the formulation and execution of sustainable policies.
- **Technological Gaps:** Limited access to technology and innovation restricts progress in key sectors like education and healthcare.
- **Global Pandemics:** Events like COVID-19 have disrupted progress, redirecting resources and priorities away from long-term goals.

3. Strategies for Overcoming Challenges To address these challenges, a multifaceted approach is essential:

- **Strengthening Partnerships:** Collaborative efforts between governments, private sectors, and civil society can pool resources and expertise for greater impact.
- **Enhancing Education and Awareness:** Promoting knowledge about SDGs among citizens fosters a culture of sustainability and accountability.
- **Innovative Financing Mechanisms:** Leveraging public-private partnerships and sustainable financing models can close funding gaps.
- **Leveraging Technology:** Embracing digital tools and innovations accelerates progress in areas like renewable energy, smart infrastructure, and e-governance.
- **Policy Reforms:** Strengthening institutional frameworks and enacting transparent policies ensure effective implementation.

4. Practical Examples of SDG Implementation Several countries provide exemplary models of SDG integration:

- **Norway:** Prioritizing renewable energy and sustainable urban planning, Norway leads in achieving climate-related goals.
- **Costa Rica:** A pioneer in conservation efforts, Costa Rica combines biodiversity preservation with community development.
- **Rwanda:** Through inclusive healthcare policies and gender equality initiatives, Rwanda has made significant strides in human development. These examples illustrate the transformative potential of aligning national agendas with SDGs.

5. Role of Individuals and Communities Sustainable development is a collective effort requiring active participation at all levels. Individuals can contribute by adopting sustainable lifestyles, reducing waste, and supporting local initiatives. Communities play a pivotal role in implementing grassroots projects, advocating for inclusive policies, and fostering resilience through education and collaboration.

Conclusion The Sustainable Development Goals offer a holistic framework for addressing global challenges while promoting human well-being, societal progress, and environmental stewardship. Realizing these objectives necessitates concerted efforts from individuals, governments, and organizations alike. By overcoming barriers and leveraging innovative solutions, the global community can achieve a sustainable future that benefits all. The SDGs are not merely aspirations but actionable targets that hold the key to building a more equitable, resilient, and prosperous world.

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Digital Trade And WTO Accession: How Uzbekistan Can Leverage Digital Platforms For Global Trade Integration

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Abstract
As Uzbekistan navigates its accession to the World Trade Organization (WTO), digital trade offers a transformative pathway to accelerate integration into the global economy. This thesis explores the strategic potential of digital platforms to enhance Uzbekistan's trade facilitation, reduce entry barriers for small and medium-sized enterprises (SMEs), and align domestic regulations with international norms. Drawing from comparative case studies, policy analysis, and international best practices, it offers actionable recommendations for leveraging digitalization to position Uzbekistan as a globally competitive, digitally enabled trade actor. The study underscores the urgency of institutional reforms, digital infrastructure expansion, and multilateral cooperation to ensure inclusive and sustainable trade growth.
Keywords: Digitalization, WTO, Uzbekistan, Trade Integration, E-commerce, Regulation, SME, Data Governance.

Introduction
Uzbekistan's bid to join the WTO marks a pivotal step in its economic transformation agenda. As global commerce increasingly shifts toward digital platforms, traditional trade models are being redefined. For an emerging economy like Uzbekistan, digital trade is not merely a complement to traditional trade, it's a strategic imperative. Digital channels can streamline customs procedures, increase market accessibility for SMEs, and elevate the overall competitiveness of national exports (UNCTAD, 2021). This thesis investigates how Uzbekistan can harness digital tools and governance reforms to achieve a seamless WTO accession process while fostering long-term trade integration and resilience.

Literature Review
The global landscape of digital trade encompasses cross-border e-commerce, digitally delivered services, and digitally enhanced transactions are phenomena which together now constitute a growing share of international trade (Herman and Oliver, 2023). Research highlights that WTO accession increasingly hinges on a country's digital readiness, including regulatory frameworks for data governance, taxation, and cybersecurity (IISD, 2019; Aaronson and Leblond, 2018).
Countries like Vietnam and Georgia have successfully leveraged digital policy reforms during their WTO accession to attract foreign investment and reduce trade costs (World Bank, 2024). In contrast, Uzbekistan remains at an early stage, with patchy e-commerce legislation, inconsistent data protection rules, and uneven digital infrastructure. Addressing these gaps is vital to ensure compliance with WTO provisions such as the *Work Program on Electronic Commerce* and the *General Agreement on Trade in Services* (WTO, 2023).

Methodology
This study employs a qualitative research approach, integrating comparative case analysis, expert interviews, and policy document review. Sources include WTO accession reports, national strategy papers (e.g., Uzbekistan's "Digital Uzbekistan – 2030"), and international indices such as the OECD Digital Services Trade Restrictiveness Index and UNCTAD's Digital Economy Reports. Triangulated data helped identify regulatory bottlenecks, map institutional readiness, and benchmark Uzbekistan's progress against peer economies.

Analysis and Results

Infrastructure and Institutional Progress. Uzbekistan has made substantial gains in broadband access, fintech innovation, and digital literacy, especially in urban centers (World Bank, 2024). Initiatives like the Single Window for Export-Import Operations and the UzEx electronic trading platform signal early successes in digital trade facilitation.

Persistent Regulatory Barriers. Despite infrastructural improvements, several gaps hinder digital trade development. The absence of comprehensive personal data protection laws, ambiguous intermediary liability regulations, and an underdeveloped digital taxation regime are key issues (OECD, n.d.). Moreover, fragmented institutional coordination weakens implementation and enforcement capacity.

Lessons from Peer Countries. Vietnam's WTO journey exemplifies the value of sequencing trade facilitation reforms with e-commerce legislation and SME digital support (Herman and Oliver, 2023). Kazakhstan's *Digital Kazakhstan* program, launched during its WTO integration, prioritized e-governance and international data standards, boosting investor confidence and trade efficiency (World Bank, 2024).

Discussion

To fully leverage digital trade, Uzbekistan must synchronize domestic reforms with WTO digital trade norms. This includes:

Enacting robust data protection and cross-border data flow regulations aligned with global standards (Aaronson and Leblond, 2018).

Harmonizing digital taxation and consumer protection frameworks.

Strengthening e-trust services (e-signatures, digital IDs) for trade documentation.

Establishing a centralized digital trade governance body to coordinate inter-agency policies.

Digital platforms can democratize trade participation by lowering barriers for SMEs, a crucial demographic in Uzbekistan's economy. However, success will depend on multi-stakeholder collaboration, especially public-private partnerships and international technical assistance programs.

Conclusion and Recommendations

Uzbekistan stands at a historic juncture where digital trade could redefine its global economic engagement. To unlock this potential and ease WTO accession, the government should implement a multi-pronged strategy:

Regulatory Alignment. Expedite the passage of WTO-consistent digital trade laws, focusing on data privacy, cybersecurity, and cross-border services.

Infrastructure Investment. Prioritize rural broadband expansion and cloud computing infrastructure to ensure inclusive access.

Capacity Building. Develop digital trade literacy among SMEs through training, subsidies, and access to digital platforms.

Institutional Innovation. Create a dedicated Digital Trade and Integration Council to oversee coordination with WTO bodies and manage regulatory convergence.

International Cooperation. Engage in plurilateral digital trade negotiations (e.g., the WTO Joint Statement Initiative on E-commerce) and partner with regional blocks for technical alignment. By embracing these reforms, Uzbekistan can emerge not just as a compliant WTO member, but as a proactive digital trade innovator in Central Asia and beyond.

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Euphemistic Language As A Tool Of Political Manipulation: A Comparative Pragmatic Study Of English And Uzbek

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Abstract
Political language is often characterized by strategic ambiguity, with euphemisms playing a crucial role in framing narratives and softening controversial actions or policies. This paper explores how euphemistic expressions are employed as tools of political manipulation in both English and Uzbek political discourse. Drawing on pragmatic theory, particularly the concepts of implicature, politeness, and face-saving, the study analyzes selected examples from political speeches, media discourse, and official documents. A comparative approach reveals that while both languages use euphemisms for similar pragmatic goals—such as concealing unpleasant truths, maintaining power, and avoiding accountability—cultural and linguistic differences influence how euphemisms are formed and understood. This study contributes to understanding the intersection of language, culture, and power in political communication.

Introduction
In the realm of political communication, language is rarely neutral. Politicians and governments often use language not merely to inform but to influence, persuade, and sometimes deceive. One of the most effective linguistic strategies in this regard is the use of euphemism. Euphemisms, defined as mild or indirect expressions substituted for harsh or offensive ones (Allan & Burridge, 2006), play a central role in shaping public perception and constructing political reality. This paper investigates how euphemistic language functions as a tool of political manipulation in English and Uzbek, drawing on comparative pragmatic analysis. The focus is on how euphemisms obscure truth, soften criticism, and serve ideological purposes. The central research questions are: (1) What types of euphemisms are most commonly used in English and Uzbek political discourse? (2) How do cultural and pragmatic differences affect the use and interpretation of these euphemisms?

Main Body

1. Euphemism and Pragmatics. Euphemisms are inherently pragmatic, as they depend on context, shared knowledge, and the speaker's intention. From a Gricean perspective, euphemisms often generate implicatures: the literal expression differs from what is implied (Grice, 1975). In politeness theory (Brown & Levinson, 1987), euphemisms serve to mitigate face-threatening acts, helping speakers to avoid direct confrontation or social disapproval. In political discourse, euphemisms are tools for framing (Lakoff, 2004), where the choice of words affects how issues are perceived. For instance, "collateral damage" in English or "yo'qotishlar" ("losses") in Uzbek sanitizes the reality of civilian deaths in military operations.

2. Euphemistic Strategies in English Political Discourse. English-speaking political leaders frequently use euphemistic expressions to reframe controversial policies:
- War and Conflict: Instead of "war," terms like "military intervention," "peacekeeping mission," or "humanitarian operation" are used.
- Economic Policy: "Spending cuts" become "fiscal responsibility" or "budget realignment."
- Surveillance: The phrase "data collection" replaces "spying."

These euphemisms aim to reduce the perceived severity of governmental actions, redirect moral responsibility, and maintain public support. For example, during the Iraq War, U.S. officials used "enhanced interrogation techniques" to avoid the legal and moral weight of the term "torture" (Hodges, 2011).

3. Euphemistic Strategies in Uzbek Political Discourse. In Uzbek, euphemisms also serve to soften criticism, defer blame, and uphold political authority. However, cultural factors such as collectivism, high-context communication, and respect for hierarchy shape their usage:
- Economic Issues: Economic hardships may be described as "muvaqqat qiyinchiliklar" (temporary difficulties) instead of “qashshoqlik” (poverty).
- Authoritarian Measures: Repressive policies might be justified using phrases like “jamoat xavfsizligini ta’minlash” (ensuring public safety) rather than "siyosiy nazorat" (political control).
- Corruption: Misconduct may be downplayed with terms like “xatolik” (error) or “tushunmovchilik” (misunderstanding).

Such euphemisms reflect the cultural tendency to avoid direct blame, maintain social harmony, and project governmental legitimacy. The state-controlled media also plays a key role in constructing these sanitized narratives.

4. Comparative Analysis

Despite differing cultural contexts, the core functions of euphemism in English and Uzbek politics are strikingly similar: concealment, justification, and control. However, linguistic structures and socio-political systems influence how euphemisms are constructed and received:

Aspect	English	Uzbek
Transparency	Often indirectly transparent (e.g., “regime change”)	More opaque due to collectivist norms
Media Freedom	Higher (in some countries), allowing critique	Lower, reinforcing euphemistic narratives
Common Themes	War, economy, security	Reforms, national unity, economic transition
Cultural Constraints	Individualistic, directness acceptable	Indirectness preferred to avoid confrontation

5. Pragmatic Implications and Ideological Functions

Euphemistic language has deep ideological implications. It not only masks truth but also reshapes public consciousness. Through repeated exposure, euphemisms normalize certain actions and policies, thus becoming instruments of “manufactured consent” (Herman & Chomsky, 1988). For example, the English phrase “downsizing” can shift blame from corporations to economic necessity, while the Uzbek “ish o‘rinlarini optimallashtirish” (optimization of job placements) reframes job loss as systemic improvement. Both serve to obscure human cost and prevent resistance.

Conclusion

This comparative pragmatic study highlights how euphemistic language functions as a powerful tool of political manipulation in both English and Uzbek. Despite linguistic and cultural differences, euphemisms in both languages serve to obscure uncomfortable truths, maintain authority, and manipulate public perception. Understanding the pragmatic and ideological roles of euphemism enables citizens and analysts to critically engage with political discourse and challenge manipulative narratives. Future research could explore audience reception of euphemisms across cultures or examine how social media affects the evolution of political euphemisms in authoritarian versus democratic contexts.

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Developing The Artistic And Creative Competence Of Creative School Students Through A Creative Approach

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Abstract
This article analyzes the role, content, and practical significance of the creative approach in developing the artistic and creative competence of students in schools of creativity. It emphasizes that a creative approach helps to reveal students' individual potential and fosters the upbringing of an independent-thinking and aesthetically aware generation.
Keywords: Artistic and aesthetic education, Creative thinking, Competency-based approach, Level of creativity, Methods of creative activity, Pedagogical innovations, Learner as a subject, Motivational environment, Reflective analysis, Individualized approach.

Introduction.

Based on the decree of the President of the Republic of Uzbekistan on the establishment of creative schools, systematic efforts are being carried out across the country to support gifted youth and fully unlock their creative potential. In this context, developing the artistic and creative competence of students in creative schools is considered one of the main directions of the educational process. A creative approach is recognized as a key factor in this process.

Main Part

1. Theoretical Foundations of Artistic and Creative Competence

Artistic and creative competence refers to a student's ability to express their creative potential, analyze based on artistic-aesthetic criteria, and articulate thoughts through art and literature. It consists of the following components:

- **Cognitive**: possessing literary, cultural, and aesthetic knowledge;
- **Practical**: creating personal creative works and using artistic means of expression;
- **Emotional**: experiencing artistic feelings and impressions;
- **Reflective**: analyzing and evaluating one's own creative activity.

2. The Essence and Possibilities of a Creative Approach

A creative approach implies a drive for innovation, creative thinking, and organizing the learning process in an engaging and effective manner. It is implemented through the following strategies:

- Creating problem-based situations that encourage independent thinking;
- Thinking through metaphors and associations**,** uncovering non-traditional links between objects;
- Cross-disciplinary approaches by integrating literature, art, history, and technology;
- Using multimedia tools such as podcasts, animations, and digital storytelling.
- 3. Practical Approach: The Experience of Creative Schools

At creative schools, the following activities have proven effective in developing students' artistic and creative competence:

- Literary competitions and stage performances;
- Writing personal creative works (poems, stories, essays);
- Group creative projects (collages, theater plays);
- Analyzing samples of Uzbek and world literature;
- Writing analytical essays based on works of art.

Through these methods, students gain not only theoretical knowledge but also practical skills.

Improving the education system based on modern and creative approaches is a priority in our country. Today, increasing the quality of education through the use of innovative methods is among the most pressing issues in pedagogy.

As our esteemed President has emphasized:

"If the methodology of teaching in schools does not change, neither the quality, nor the content, nor the environment of education will change."

The primary goal of the international scientific-practical conference “Creative Pedagogy: A Modern Approach to the Educational Process” is to discuss these very issues. This forum brings together researchers, educators, and practitioners from around the world to exchange ideas and strategies on developing critical thinking skills in education, 21st-century teacher competencies in a digital environment, project-based learning, and standards-based assessment methods. The application of creativity in education not only increases the effectiveness of knowledge acquisition but also fosters independent thinking, the development of original ideas, and practical application skills in students.

These issues are of vital importance not only for researchers but for every educator responsible for shaping future generations.

I am confident that the ideas, experiences, and strategies shared during this conference will make a valuable contribution to the further advancement and quality enhancement of the education system. Additionally, the knowledge and experience exchanged will help define new directions for integrating digital technologies into learning and improving educational outcomes. Furthermore, the conference outcomes will serve as a solid foundation for fostering effective collaboration among teachers, enhancing their professional skills, applying advanced methods in practice, and developing students’ creative and critical thinking abilities.

I wish all conference participants great success, boundless inspiration, fresh ideas, and renewed strength in the noble mission of educating future generations.

Modern Global Trends and the Role of Artificial Intelligence in Education In today’s era of globalization, every nation is paying serious attention to youth education and reviewing its education system through the lens of “The Digital Transformation Era.” As technologies, including Artificial Intelligence (AI), are rapidly evolving, the reform of education systems must align with these trends.

One of the top priorities in the education sector today is to train youth with advanced skills, creativity, and strong foundational knowledge in a digital environment. Supporting gifted students and equipping them with modern skills in line with the demands of the new era is of great importance.

For this reason, various specialized educational institutions — including Presidential, creative, and specialized schools — are actively working to integrate modern innovations and technologies into the learning process.

Under the leadership of President Shavkat Mirziyoyev, broad policies are being implemented to promote artificial intelligence and digital transformation. National programs and strategies, particularly the “Digital Uzbekistan – 2030” strategy, are being carried out systematically. During the study of international best practices, close attention is paid to reforms related to AI technologies in countries like the USA, China, and EU member states.

The President’s instructions to support AI-based projects, foster mechanisms for innovative decision-making, and establish grant programs to promote national startups are commendable. These efforts aim to ensure active participation of future generations in technological advancement and to position Uzbekistan's education system to compete with global standards.

In this policy, the education sector plays a leading role. After all, building a digital economy and effectively implementing AI requires the preparation of high-quality personnel. Based on this, various ministries, institutions, and research organizations are now collaborating on preparing specialists in fields such as IT, AI algorithms, and cybersecurity.

Presidential schools, specialized schools, and creative schools are expected to serve as laboratories for talented students and specialists in this process. Once exclusive to scientific research, AI is now a part of everyday life. These technologies are widely used in education, industry, decision-making, healthcare, logistics, and transportation.
Today, the possibilities of using AI in education have grown significantly. With the integration of AI into education, we can deliver knowledge to students using entirely new methods, personalize learning, and motivate them more effectively. As a result, students develop a stronger interest in key subjects and prepare for future professional life using the most modern tools and technologies.

Conclusion. In conclusion, developing the artistic and creative competence of students in creative schools through a creative approach not only helps uncover each student's individual potential but also fosters their growth as expressive, independent, and aesthetically aware individuals. This approach aligns with modern education and is one of the most effective ways to develop the competencies needed for the future.

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Pragmatic Functions Of Euphemisms In Political Rhetoric: A Contrastive Study Between Indo-European And Altaic Language Families

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Abstract
Euphemisms are linguistic tools that serve to soften, obscure, or reframe sensitive or controversial issues. In political rhetoric, they play a crucial role in shaping public perception, maintaining face, and exercising power. This paper examines the pragmatic functions of euphemisms in political discourse within two major language families: Indo-European (e.g., English, Russian) and Altaic (e.g., Turkish, Uzbek). Through a contrastive analysis, the study identifies both universal and language-family-specific uses of euphemisms in political rhetoric. The findings reveal patterns in how euphemisms are employed to avoid directness, mitigate responsibility, and manipulate public opinion, with notable differences influenced by cultural and socio-political contexts.

Introduction

In the realm of political communication, language serves not only as a vehicle for information but also as a strategic tool for shaping public perception, maintaining power, and managing social relationships. One of the most frequently employed linguistic strategies in political rhetoric is the use of euphemisms—indirect or softened expressions that replace words or phrases considered harsh, unpleasant, or controversial. Politicians and state institutions often rely on euphemistic language to frame complex or unpopular decisions in more acceptable terms, reduce public backlash, and align their messaging with broader ideological narratives.

Euphemisms in political discourse perform several key pragmatic functions. They act as politeness strategies by mitigating face-threatening acts, thus allowing speakers to avoid direct confrontation or offense (Brown & Levinson, 1987). Moreover, they serve as face-saving mechanisms, enabling political actors to preserve their credibility and moral authority while addressing sensitive topics such as war, economic crisis, or political repression. From a broader perspective, euphemisms also function as tools of ideological persuasion, subtly shaping the way information is presented and understood by audiences, thereby influencing public opinion without overt manipulation.

While the use of euphemisms is a common feature across many languages, the forms they take and the cultural values they reflect can vary significantly. Much of the existing literature has focused on euphemism use within single-language contexts. However, there is a growing need for cross-linguistic and cross-cultural investigations that reveal how different language families approach euphemistic strategies, particularly in politically sensitive discourse. This study aims to explore and compare the pragmatic functions of euphemisms in political rhetoric across two distinct language families: Indo-European (represented by English and Russian) and Altaic (represented by Turkish and Uzbek). By analyzing authentic political texts, the research sheds light on both universal patterns and culturally specific uses of euphemisms in political language.

Theoretical Framework. The analysis in this study is grounded in pragmatic theories such as Speech Act Theory (Austin, 1962; Searle, 1969), Politeness Theory (Brown & Levinson, 1987), and Critical Discourse Analysis (Fairclough, 1995). These theories explain how euphemisms serve as indirect speech acts, face-saving strategies, and ideological tools. The concept of

linguistic relativity also plays a background role in understanding how language structure influences euphemistic strategies across different language families.

Methodology. A qualitative contrastive analysis was conducted on political speeches, press releases, and government statements from English-speaking, Russian-speaking, Turkish-speaking, and Uzbek-speaking politicians from 2010 to 2024. The corpus includes examples from international organizations (e.g., UN, EU), national parliaments, and televised debates. Euphemisms were identified and analyzed for their pragmatic function, categorized according to purpose (e.g., concealment, mitigation, persuasion) and evaluated against their socio-political context.

Pragmatic Functions of Euphemisms in Indo-European Political Rhetoric English political rhetoric uses euphemisms for face-saving, policy softening, and military justification. Examples include 'collateral damage' (civilian casualties), 'quantitative easing' (printing money), and 'enhanced interrogation' (torture), which reduce accountability (van Dijk, 2006). Russian political discourse, in contrast, employs euphemisms like 'special military operation' (war) and 'optimization of healthcare' (cutbacks), reflecting institutional control (Fairclough, 1995). Pragmatic Functions of Euphemisms in Altaic Political Rhetoric Turkish political euphemisms emphasize unity and national identity, such as 'kardeşlik projesi' (brotherhood project) and 'temizlik operasyonu' (cleaning operation). In Uzbek, euphemisms like 'davlat siyosati' (state policy) or 'moslashtirish' (adjustment) maintain social harmony and show deference to authority (Brown & Levinson, 1987). Contrastive Analysis. Common across both families is the use of euphemisms to avoid negative evaluation and frame actions positively. However, Indo-European languages often use technocratic or militaristic euphemisms, while Altaic languages use emotionally resonant or respectful expressions. These differences reflect underlying cultural values such as individualism vs. collectivism (Lakoff, 1975).

Conclusion

Euphemisms play a significant role in political rhetoric across both Indo-European and Altaic language families, functioning as essential pragmatic tools that help politicians shape discourse, manage face, and influence public perception. While the core functions of euphemisms—such as softening unpleasant realities, avoiding direct confrontation, and maintaining social harmony—are broadly universal, their linguistic forms and underlying motivations differ across cultures and language systems.

In Indo-European languages like English and Russian, euphemisms often adopt bureaucratic, technocratic, or militaristic tones, reflecting political systems that emphasize institutional authority and policy rationalization. In contrast, Altaic languages such as Turkish and Uzbek frequently rely on culturally resonant, emotionally toned, or honor-driven expressions, highlighting collectivist values, respect for authority, and national unity.

These differences underscore the influence of sociolinguistic norms and ideological frameworks on language use in political contexts. Euphemisms not only reflect cultural attitudes but also reinforce them, subtly guiding how political messages are received and interpreted by different audiences.

This contrastive study reveals the complexity and adaptability of euphemistic language in political discourse. Future research could deepen this inquiry by analyzing additional languages within these and other families, as well as examining how euphemistic strategies evolve over time in response to shifting political and social conditions.

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Designing Students' Independent Learning In The Era Of Digital Technologies

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Abstract
This article discusses the current state-of-the-art promotional work in the pedagogical design of independent educational processes of students in digital educational environments in higher educational institutions of the Republic of Uzbekistan.
Keywords. Digital economy, individual educational trajectory, e-business, information technologies.

The role of digital technologies in modern education Nowadays, it is impossible to organize the educational process without using modern digital technologies. A 21st-century student should develop the following skills and qualities: personal responsibility, tolerance, communication abilities, self-development, critical thinking, analysis, management, synthesis, evaluation, creativity, teamwork, and problem-solving capabilities. Due to the transition of the higher education process to a credit-module system, the number of classroom hours has been reduced while the time allocated for independent study has increased. As a result, students must accumulate credits for each subject. For example, in one subject per semester, 26 hours are allocated for lectures, 26 hours for seminars, and 78 hours for independent learning. This shows that students need to approach each subject individually and master the material independently. The professor's role is to provide guidance.
In the Address of the President of the Republic of Uzbekistan to the Oliy Majlis (Parliament), it was emphasized that mastering digital knowledge and modern information technologies is necessary and essential for achieving progress. It was noted that digital technologies not only improve the quality of products and services but also reduce unnecessary expenses, increase efficiency, and, in short, can significantly improve people's lives. The task of developing and implementing the “Digital Uzbekistan – 2030” program, which aims to modernize all sectors of the economy based on digital technologies, was set. This opens up wide opportunities for the modernization of leading industrial sectors, increasing competitiveness, introducing advanced technologies, establishing high-tech enterprises, technoparks, manufacturing companies, and building modern engineering-communication infrastructures.
In the 1940s–60s, “electric” technology emerged, including typewriters with replaceable elements, copy machines using plain paper, and portable dictaphones. These tools improved document processing quality, quantity, and speed, enhancing management efficiency. Many modern institutions are based on such technologies. It can be said that information technology originated millions of years ago with the first forms of communication between humans—various sounds, gestures, and actions. Initially, information exchange occurred only between individuals. With the advent of speech (around 100,000 years ago), humans gained the ability to store information mentally. Over time, digital information technologies expanded from simple communication to encompassing almost every aspect of human life.
The modernization of the educational and upbringing process in higher education institutions, improving the quality-monitoring system of teacher training, equipping future educators with modern professional knowledge, skills, and abilities, and forming acmeological motivation

towards professional activity are among the essential tasks in shaping the professional readiness of pedagogical specialists. The experience of developed countries such as the UK, Australia, Switzerland, Germany, Malaysia, and Canada shows that the main goal of professional education is to develop students' intellectual and logical thinking based on the specific features of their chosen field. Through task-based learning, professional readiness is ensured.

To enhance professional readiness, students must thoroughly master digital technologies. During independent learning, students can use digital technologies in their professional activities by approaching each subject individually. In the current era of constant updates, it is essential to master digital technologies, apply them, and use them in practice to develop personal activities.

Lecture classes conducted with the help of digital information technologies are more effective and comprehensible compared to those without them. As the saying goes: “Seeing once is better than hearing a thousand times.” During practice, students who use digital technologies can conduct open lessons that captivate the attention of school pupils. The application of digital technologies is effective not only in education but in various other sectors as well.

Taking the independent study of one subject as an example, a professor can assign tasks to each student individually or in groups. The preparation of essays, presentations, lesson plans, and other assignments greatly benefits from digital technologies.

Today, digital technologies have deeply penetrated nearly all areas of life, especially education. The educational process has become more flexible, adaptable, and individualized through digital tools. In addition to traditional classroom teaching, online classes, video lessons, and webinars have become widespread. Students now have the opportunity to learn from any place at any time (distance learning).

Digital technologies provide content tailored to each student’s interests, level, and learning pace. AI-based systems (such as Duolingo and Coursera) analyze students’ knowledge levels and offer personalized recommendations. Educational resources are expanding with access to online libraries, scientific article databases, electronic textbooks, and video lectures. Teachers also use digital resources to improve their methodologies. Students are developing self-learning skills and transitioning to more responsible and active learning. Designing learning, creating personal timetables, and solving online tests turn students from passive listeners into active participants.

Online testing, electronic assessment systems, and automatic analysis tools allow for precise evaluation of knowledge. Communication between teachers and students (through forums, chats, platforms) is becoming faster and more effective.

The integration of modern information technologies in the education process enables:

- Acquisition of professional knowledge by students;
- Deep understanding of subjects through modeling events and processes;
- Expansion of students' independent activities due to diverse learning formats;
- Personalization and differentiation of the learning process through interactive communication;
- Mastering learning strategies via AI systems;
- Development of information culture as members of the information society;
- Increased student interest and activity in science through computer-based representations of studied phenomena and processes.

The didactic possibilities of information and communication technologies (ICT) in the educational and training process can be viewed in terms of the object’s natural characteristics, technical and technological features, and their application for didactic purposes. ICT's didactic possibilities can be categorized into three groups:

1. Presenting educational information;
2. Transmitting educational information;

3. Organizing the learning process.

Didactic opportunities in presenting educational information using ICT include:

- Displaying and transmitting educational content in text, graphics, audio, video, and animation formats via electronic resources;
- Presenting engaging content;
- Reinforcing and applying knowledge based on received information;
- Preparing, organizing, and processing educational, methodological, and scientific data;
- Storing and collecting information;
- Systematizing information.

Conclusion: In pedagogical activity, using digital technologies enables sharing, presenting information, facilitating learning, and creating systems that simplify analysis and assessment for teachers. Through digital technologies, both teachers and students can teach and learn more effectively.

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Emotional Word Analysis Which Means Insult Words In English

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Abstract
In this article, the words that are insulting in English are extensively analyzed and grouped. The main function of insulting words is to discredit a person in front of others. The article also gives a wide range of zoometaphors applied to humans in relation to their negative qualities. These words are words that have a negative connotation. The article gives several examples of these words.
Keywords: emotion, insults, zoometaphores, vulgarisms, context.

The study of human emotions and their linguistics is one of the most pressing issues today. The word “emotion” is derived from the Latin word for arousal, excitement, and is defined as “a person's reaction to the influence of external and internal stimuli, covering all types of emotions and experiences”.
Emotions include words that express all emotions, such as joy, sorrow, joy, anger, hatred, love, friendship, as well as insults.
A group of words in an emotional lexicon that have a semantic representation of insult will consist of words that have a negative connotation. Emotional vocabulary is very diverse. We need to distinguish words that express emotion from words whose main function is to evoke emotion. Based on the collected language materials, we analyzed three types of emotional lexicon, taking into account the function they perform in the text. The purpose of the first type of emotional vocabulary is to make a certain impression and evoke a response.
The second type of emotional vocabulary represents the emotional state of the “opener of one’s heart” in a given context. S. Lewis points out that when two people use the words **Damn** or **Bloody** or **Sickening** when they are late for a train and stay on an empty platform, they don’t try to provoke a sense of frustration in each other, they just open their hearts.[1] As can be seen from this example, words of insult are among the emotional words that serve to express emotion, such as words of encouragement. If this group of emotional vocabulary is compared with the other groups described above, this is exactly the function of insult words. However, the origin and intended purpose of insults are not the same. When analyzing the content of the group, first of all, different types of curses (curses) are distinguished: **God, My God, My God, (the) devil, (the) hell, on earth**, and so on. This type of insult is close to exclamatories. Those who pronounce these words do not aim to exchange ideas with the listener, the predominant function of these words is to express emotion. From the examples given, it is clear that the words denoting curses are the names of monsters beings and ideas, i.e. the very nature of emotional words determines their function.
The next third group of insulting words can be grouped under the conditional name “vulgarisms”. Unlike words that express curses, vulgarisms inevitably become rude, insulting words that are perceived by the listener in exactly the same way. Their overall emotional meaning is sharply negative. However, their functional orientation brings them closer to a group of curses because insulting words are as impersonal as cursing words, meaning they are not directed at any specific person. Thus, their main function is also to express emotion. Vulgarisms include words such as **bloody (blaster, blessed, blooming** - euphemisms), **damn, beastly, rotten, stinking, four-letter words**, and so on. Here are some examples: **1. She successively related the story of Bishop W. as the bloody shovel. This somewhat**

shocked the ladies, but Mrs. Maystone Ryle could not spoil her point by the omission of a swear word. (Craddock, 100). 2. They'll all want to know, but it's none of their darn business. (Terrace, 99). 3. "Everyone else in this blasted college may change their minds twice a week", said young Luke, who was frantic with hope, who had anyway given up being tactful with me. (Masters, 20). There are cases where a single word itself can be perceived as both a vulgar vulgarism and a specially targeted insult. For example: **"You're a damned bully", he whispered in a passion of misery and futile rage. "A damn stinking bully". "Come, come", said Mr. Cardan. "I protest against stinking" (Leaves, 253).**

It is clear from the context that the main goal of the speaker is to "open his heart," but the word stinking, which is included in the vulgarisms in the above explanation, is actually perceived as insulting by the listener.

An unsystematic approach to vocabulary of this type has already been noted. We begin the analysis with a group of zoometaphors: **ape, bug, crab, goose, hen, hyena, worm, jackal, sparrow, horse, dog,** and so on. In the presence of certain common features, they have much more features that differentiate their use. For example, **ape** is not only **a person who imitates, mimic** (according to WND) [2], but also a **silly, simpering person; crab** this - **cross, irritable person**; **bug** this - **stupid person (narrow-minded); goose** this - **silly, foolish person; hen** this - **an old fussy woman**, (… **woman** - according to WND); **worm** this - **low, dishonest person**, etc.

In conclusion, it can be said that words whose main task is to offend a person, to discredit him in public, can be conditionally called "insult" ("curse"). Insults are always directed at specific individuals, who evaluate them "according to their dignity" and respond accordingly.

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Methods And Technologies For Developing Reflective Skills (Trainings, Interactive Methods, Game Technologies)

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Abstract
This article analyzes the methods and technologies used in developing reflective skills among future educators and caregivers. Specifically, reflection is considered as a means for analyzing one's activities, self-awareness, and achieving professional growth. The study examines the impact of training sessions, interactive methods (such as discussions, clustering, concept mapping, and brainstorming), as well as game technologies on reflective processes.
Additionally, the compatibility of innovative pedagogical technologies with reflective education and the mechanisms for their implementation in practice are substantiated.
Keywords: Reflection, reflective skills, training, interactive method, game technology, critical thinking, self-assessment, educational game, pedagogical technology, psychological training, professional preparation, concept map, communication skills, motivation, reflective journal, professional identity.

Introduction

Today, in the education system, special attention is given to the individual growth of students based on learner-centered approaches. In particular, the importance of reflective skills is increasingly recognized in developing the personal and professional competencies of future educators preparing for pedagogical activities. Reflection is the process by which a person consciously analyzes and evaluates their thoughts, feelings, actions, and professional activities. These skills are an essential tool for educators to work on themselves, understand emerging problems, and approach their resolution creatively and critically [1].
In the modern educational process, effective methods and technologies are applied to develop reflective competencies. Specifically, through training sessions, interactive methods, and game technologies, students develop not only their knowledge acquisition but also self-awareness, self-assessment, reasoning, and decision-making skills. These technologies serve to increase student engagement, encourage independent thinking, and deepen reflective thinking through the analysis of pedagogical situations.
Especially through training, students develop the ability to express their feelings, analyze themselves, and prepare for change via group communication and experience sharing. Interactive methods foster active participation, critical thinking, and collaborative decision-making skills. Through game technologies, future educators gain opportunities to model real-life pedagogical situations and pre-analyze their actions.
Therefore, the in-depth study of methods and technologies aimed at forming and developing reflective skills, and their effective integration into the educational process, is considered an important methodological and practical task. This article highlights the theoretical foundations, practical significance, and effective ways of implementing such technological approaches [2].

Main Part of the Research

The process of forming and developing reflective skills plays a crucial role in the professional preparation stage of future educators. Training sessions, interactive methods, and game technologies serve as important tools for the effective development of these skills. The study aimed to identify how the integration of these methods into the educational process changes the reflective potential of future educators.
In the first phase, through the use of training sessions, students developed skills in analyzing their thoughts and actions, maintaining emotional balance, and adopting a reflective approach to problematic situations. The training included exercises organized into blocks such as

"Stages of Self-awareness," "Critical Analysis," and "Personal Evaluation." For example, in the "Reflective Circle" training, participants wrote down their actions during their latest pedagogical practice and discussed them in groups. This helped students develop a critical perspective on their work and think about how to improve in the future [3].

The second phase involved lessons based on interactive methods. During this process, methods such as the "Fishbone" (Ishikawa Diagram), "Six Thinking Hats," and "Large and Small Group Discussions" were applied. Especially in the "Pedagogical Situation Analysis" activity, students examined a problematic situation that arose during a real lesson and analyzed it from different perspectives. Each group justified their reflective approach to the situation and defended their decisions. This method proved useful in developing students' communication, debate, social interaction, and reasoning skills.

In the third phase, game technologies were used to enhance reflective thinking. Activities were conducted based on role-playing games, pedagogical simulations, and professional case scenarios. For instance, in the game scenario titled "The Case of a Difficult Child," students participated as the educator, the child's mother, and a psychologist, analyzing the problem. Each role was presented reflectively, leading to a common decision. This helped develop students' empathy, listening skills, professional thinking, and ability to act based on reflection [4].

During the research, reflective journals were also introduced. After each training or interactive session, students filled out specially designed journals. In these journals, they wrote their thoughts based on questions like "What did I learn?", "What was easy?", and "What challenged me?" Mentors analyzed these journals weekly and provided individual feedback. This approach proved highly effective in deepening reflection and increasing students' self-awareness.

The portfolio collection method directed students to document their professional growth path and consistently work on themselves. The portfolio included achievements, changes, assessments, mentor recommendations, and reflective notes from trainings, interactive lessons, and games. Portfolios were evaluated monthly, and progress was regularly monitored.

The results of the experimental practice using the above methods showed that technological approaches developing reflective skills not only improve future educators' professional preparation but also increase their need for self-awareness, self-regulation, and personal development [5-6].

Therefore, it was proven that combining training, interactive methods, and game technologies in pedagogical processes enhances education quality and ensures personal stability by developing reflective skills. Through these methods, learners not only gain knowledge but also analyze their activities, communicate effectively, and develop their professional identity.

Conclusion

The results of the research indicate that developing reflective skills is a priority direction in pedagogical education and serves as an important factor in the professional growth and personal development of future educators. The complex use of training, interactive methods, and game technologies enables students to effectively develop critical thinking, self-assessment, responsible approaches to their work, communication culture, and professional reflection abilities.

In summary, the combined use of innovative methods and technologies in developing reflective skills elevates the professional preparation of future educators to a higher level. This lays the foundation for them to become modern pedagogues who think independently, act responsibly, and continuously work on self-improvement.

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The Archetype "Tree" In The Picture Of The World Of A Modern Person (Based On The Material Of The English Language)

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Abstract
The most ancient archetypes are close to modern man. One of them is the "tree". Man has always felt his kinship with plants and trees. As the study shows, this archetype is widely used in modern English-language prose and is often found in comparisons in the function. In this function, the archetype "tree" serves to symbolically convey the life force of a person. Comparing a person to a healthy, flowering tree speaks of the health and well-being of the person himself. Conversely, comparing a person to a sick, damaged tree, or a log indicates illness or fatigue.
Keywords: archetype, symbol, comparison, tree, life.

The purpose of the article is to establish the regularities of archetypal (symbolic) comprehension of the world by a modern person by analyzing a number of linguistic structures of English linguistic culture. As research shows, the most ancient archetypes of mankind are widely represented in the picture of the world of modern man. C. Jung wrote in his time that a person is "a curious mixture of characteristic features acquired at different stages of the centuries-old process of mental development. From this mishmash the modern man and his symbols are formed" (Jung 1997: 445).
As is known, the concept of archetype was developed by C. Jung on the basis of the study of the primitive layers of the psyche manifested in dream images. This idea was born under the influence of S. Freud, as C. Jung himself writes: "... we must take into account the phenomenon (first described and commented on by Freud) which consists in the frequent occurrence in dreams of elements which do not belong to the dreamer's personality and are in no way related to his experience. These elements... were called by S. Freud "the remains of antiquity" and are figurative thoughts, the explanation of the presence of which cannot be found in the life of the dreamer. They seem to be primordial, innate, and inherited forms of mind from primitive people" (Jung 1997: 65). Archetypal images or archetypes, according to C. Jung, are elements of the human subconscious, which are formed on the basis of human activity, they are inherent in all people, are inherited and are most often found in dreams. However, their presence in consciousness can only be detected through language. Language, as it were, actualizes these ancient symbols or archetypes. They can appear in fiction and are widely used by writers and poets. Y.M. Lotman wrote that the "alphabet" of symbols of a particular poet is not always individual. A symbol is always associated with the memory of culture, and a number of symbols vertically permeate the entire history of mankind, while it is possible to actualize very archaic images of a symbolic nature. This is the so-called "core", according to Lotman, group of symbols, which has a deeply archaic nature and dates back to the pre-literate era. Y.M.Lotman emphasizes that elementary symbols have a greater cultural and semantic capacity than complex ones: "It is 'simple' symbols that form the symbolic core of culture" (Lotman 1987: 13). The archaic nature of a symbol, therefore, is its essential feature, a symbol never belongs to any one layer of culture, it always permeates the historical section vertically, originating from the past and going into the future. The nature of such symbols, according to Y.M. Lotman, is dual. On the one hand, penetrating the thickness of the centuries, the symbol is realized in its invariant essence. And in this aspect, we can observe its recurrence. Such a symbol acts as a "messenger" of ancient epochs, as a reminder of the "ancient" or eternal foundations of culture. On the other hand, the symbol actively correlates with the modern cultural context and is

transformed under its influence. In this case, we can say that the invariant essence of the symbol is realized in variants. In general, the structure of symbols of a particular culture forms a system that is isomorphic and isofunctional to the genetic memory of an individual (Lotman 1987: 10-21; Lotman 2004: 221, 241).

At present, archetypes are widely used in modern psychotherapy, where they are considered as accumulators of psychological charge or tension. The main goal of a psychotherapist who uses such symbols is to influence the unconscious. This is what the famous Italian psychoanalyst and founder of psychosynthesis, R. Assagioli, sees as the main function of symbols. We will not go into the details of the use of symbols in the psychotherapeutic procedure proposed by R. Assagioli. Let us dwell only on his classification of archetypes. So, R. Assagioli distinguishes: 1. Natural symbols: air, earth, fire, water, sky, stars, sun, moon. Among the main symbols of nature, the most important, from the point of view of the author of the study, are the mountain (the technique of "climbing" is associated with it), the sea, the stream, the river, the pond, the wind, the cloud, the rain, the fog, the cave, the tree, the flame, the pearl, the diamond, as well as various symbols associated with light (sunrise, sunset, sun, rays of light, etc.) and darkness (twilight, etc.). 2. Symbols of "animals": lion, tiger, snake, bear, wolf, bull, goat, deer, fish, caterpillar-chrysalis-butterfly (symbols of transformation); birds: eagle, dove, etc.; Pets: horse, elephant, dog, etc., egg. 3. Human symbols: father, mother, grandfather, grandmother, son, daughter, sister, brother, child, hand, eye, heart, etc. 4. Man-made symbols: bridge, canal, reservoir, tunnel, flag, fountain, illuminated house, candle, road, wall, door, palace, staircase, mirror, box, sword, etc. R. Assagioli also distinguishes religious and mythological symbols, abstract symbols, individual and spontaneous symbols: [Assagioli 2000:46-47].

Most archetypes or ancient symbols, as can be seen from the list above, are associated with practical human activity and with the environment. They denote objects and phenomena that play a primary role in human life. Being elements of everyday life, they acquire a great semantic load and emotional saturation. At the same time, they become a kind of "model", "standard" of human culture, turning into symbols. Before proceeding to consider what role the archetype or symbol "tree" plays in the picture of the world of modern man, let us consider the relationship "man to tree". Everyone will say that we feel a certain kinship with plants and trees and endow them with life similar to that which we possess ourselves. Obviously, this was the case

T.V. Chernigovskaya notes that, in fact, such an attitude of man to a tree is not animism. In her opinion, finding the features of life in plants is something different from the search for features of life in other objects. These are completely different types of mental activity. When there is a search for life in some other objects, it is a rational, almost scientific search. trees, then this is a procedure comparable to the archaic animation of objects. Archaic animation of objects is, as is known, a function of the right hemisphere of the brain, a function oriented towards mythologization and metaphorization of the surrounding world [Chernigovskaya 1993: 35]. Here we can also recall the beliefs of the Druids, according to which each person corresponds to a tree. The comparison of man with a plant was also made by Aristotle, who said that everything that lives and has a soul must have a vegetable soul from birth to death, so that what is born grows, reaches maturity and declines. At the same time, he noted that the fruit is nourished by a woman in the same way as a plant is nourished by the soil [Aristotle 1978: 445]. It should be noted that most of these archetypes or symbols reveal themselves in comparisons. Sigmund Freud drew attention to this [Freud 2004: 146]. And this is no coincidence. After all, a symbol, an archetype is a standard that can be used in comparisons with other objects and phenomena. An interesting example of the comparison of man with a tree is given by the Bible. In the Gospel of Mark, an episode of Jesus healing a blind man is described:

He took the blind man's hand and led him out of the village. Then He spit on his eyes and laid His hands on him. He asked him, “Can you see anything?” He looked up. “I see the people,” he said. “They look to me ***like trees walking around.”*** [Bible, Mark:8-23].

A recovered person mistakes the people around him for trees.
Probably, there is some deep connection between man and the tree or maybe with the Tree of Life? A.N. Afanasyev describes in detail the Tree of Life as it is represented in the Indian epic: "Its branches go down, and its roots go up; all the worlds rest on it, the gods built both heaven and earth from it; Amrita drips from the leaves of the tree, and healing herbs grow under it. Later Indian legends call this tree Pra: it grows in the kingdom of Brahma, on the other side of the stream that bestows eternal youth, and bears all the fruits that exist in the universe (Afanasyev 1995: 144). An attempt to depict the Tree of Life was made by many scientists, in particular by T. de Chardin. The evolution of life forms on Earth is considered by T. de Chardin as the Tree of Life. At the base of the Tree there are bacteria, the main branch is made up of primates, and anthropoids are the stem, which reveals the complex structure of the fan. "In the mobile multitude of institutions, peoples, empires, history registers the normal development of Homo sapiens... The oldest scales are gradually falling off, only a few of them, such as the Australians, are still preserved on the outskirts of our civilization and continents. .... Branches that wither, branches that rest, branches that rush forward to seize everything. An endless crossing of fans, none of which, even when moving back two millennia, clearly reveals its petiole... [Chardin 2002:319].
This closeness and almost kinship between man and the tree leads to the fact that the archetype "tree" is used to symbolically convey the life force of a person. Here are examples from modern English-language fiction.
She felt a little betrayed and sad, but presently a moving object came into sight. It was a huge ***horse-chestnut tree*** *in full bloom bound for the Chaps Elysees, strapped now into a long truck and simply shaking with laughter –* ***like a lovely person in an undignified position yet confident none the less of being lovely*** [Fitzgerald 1994:84].

A sad girl, who thinks that she has been betrayed, sees a large blossoming chestnut tree and involuntarily compares herself with it. The author conveys this feeling by comparing a blossoming chestnut tree with a person - Despite the uncomfortable position in the truck, it is confident in its beauty. There is a triple comparison here: **a young girl – a tree – a person.** This suggests that the comparison of man with a tree is symmetrical. At the same time, comparandum (the basis of comparison) and comparatum (the word to which he compares) are absolutely equal in relation to the basis of comparison.
Sometimes, in order to show that something wrong is happening to a person, he is compared to a leaf that has been torn from the trunk, from its roots, and thereby lost its vitality, as in the following example:
Her body was pale and green ***like a birch leaf lying in water*** [Lee 1959: 401].

The comparison of a person with a leaf from a tree can be found in many authors:
Did you shrivel ***like a leaf cut off from the juices of the trunk?*** [Rivers 1998:194].
In this example, a person is compared to a leaf that has been torn away from the trunk that fed him.
Sometimes generations passing away are compared to leaves:
... the passing generations – the pavement was crowded with bustling middle-class people - vanished ***like leaves****,* ***to be trodded under, to be soaked and steeped and made mould of by that eternal spring*** [Woolf 1981:82].

In this example, the outgoing generation is compared to fallen leaves that pave the way for the new generation. At the same time, we often call the new generation "young shoots".
Sick parts of the body are compared to a damaged tree, to a log. *My limbs went splintering* ***like logs*** [Lee 1959: 159].

In the Russian language, there are also fixed expressions "old stump", i.e. a sick person; In English, "sleep like a log" and the Russian "sleep like a log" speak of the lack of vitality, because a person is in a deep, almost senseless sleep.

As can be seen from the above examples, the archetype "tree" is widely used in modern English-language prose, which suggests that this archetype occupies an important place in the picture of the world and the consciousness of modern man. It can be said that the perception of the world by a modern person is diverse. He perceives the world not only from the point of view of technological progress and its achievements, but also from the point of view of certain central or primary entities, such as archetypes or the most ancient symbols, which play an extremely important role in our consciousness and subconscious, on the one hand, and on the other, nourish language through comparisons and metaphors.

Ancient archetypes are easily understandable for every man in modern society. One of such archetypes is “tree”. Man has always realized its kinship with plants and trees. The research shows that this archetype is often encountered in modern English and American literature and is often used in simile as comparandum. In this function archetype “tree” symbolically renders the meaning of life force and vitality. Comparison of a man with a healthy, blossoming tree speaks of his health and well-being; on the contrary comparison of a man with a sick or damaged tree or a log symbolizes fatigue or disease.

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The Practical Importance Of Ensuring The Security Of Web Applications

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Abstract
This article discusses the relevance of ensuring the security of web applications, modern threats, methods for eliminating them and their practical significance. Web applications are now of central importance not only for economic activity, but also for social relations, security and even expert-forensic systems. In particular, technologies such as facial recognition and biometric authentication are becoming an integral part of the security of today's web applications.
Keywords: web security, SQL injection, XSS, authentication, encryption, OWASP, biometric systems, user data
Annotatsiya
Ushbu maqolada web ilovalar xavfsizligini ta'minlashning dolzarbligi, zamonaviy tahdidlar, ularni bartaraf etish usullari va amaliy ahamiyati yoritilgan. Web ilovalar bugungi kunda nafaqat iqtisodiy faoliyat, balki ijtimoiy munosabatlar, xavfsizlik va hatto ekspert-криминалistik tizimlar uchun ham markaziy ahamiyat kasb etmoqda. Xususan, yuzni tanib olish, biometrik autentifikatsiya kabi texnologiyalar bugungi web ilovalar xavfsizligining ajralmas qismiga aylanmoqda.
Kalit so‘zlar: web xavfsizlik, SQL injection, XSS, autentifikatsiya, shifrlash, OWASP, biometrik tizimlar, foydalanuvchi ma'lumotlari

Kirish

Bugungi raqamli davrda web ilovalar hayotimizning ajralmas qismiga aylangan. Onlayn banking, ta'lim tizimlari, e-commerce platformalari, ijtimoiy tarmoqlar va hatto xavfsizlik tizimlari web asosda ishlamoqda. Ammo bu qulayliklar bilan bir qatorda, web ilovalarga qarshi tahdidlar va xakerlik hujumlari ham jadal rivojlanmoqda. Xavfsizlikning buzilishi nafaqat foydalanuvchi ma'lumotlarining o‘g‘irlanishiga, balki butun tizimlarning ishdan chiqishiga olib kelishi mumkin.
Web ilovalar xavfsizligining dolzarbligi. Ma’lumotlar hajmining oshishi, ulardan foydalanish tezligining ko‘payishi, turli platformalarning o‘zaro integratsiyalashuvi web xavfsizlik masalasini birinchi darajali muammoga aylantirdi. Foydalanuvchi ma'lumotlarining himoyasizligi xakerlar uchun katta imkoniyatlar yaratadi. Ayniqsa, moliyaviy va biometrik ma'lumotlar bugungi kunda eng qimmat aktiv hisoblanadi.
Web xavfsizlik tahdidlari va ularning turlari. Web ilovalarga nisbatan eng ko‘p uchraydigan tahdidlar:

- **SQL Injection** – serverga soxta SQL so‘rov yuborish orqali ma’lumotlar bazasiga noqonuniy kirish;
- **XSS (Cross-site Scripting)** – foydalanuvchi brauzerida zararli skriptlarni ishga tushirish;
- **CSRF (Cross-site Request Forgery)** – foydalanuvchini o‘z xabarisiz boshqa so‘rov yuborishga majbur qilish;
- **Brute Force** – login-parollarni taxmin qilish orqali tizimga kirish;
- **Session Hijacking** – sessiya identifikatorini o‘g‘irlab tizimga kirish.

Amaliy yechimlar va tavsiyalar

- **Autentifikatsiya va avtorizatsiya** – foydalanuvchini aniq aniqlash va unga ruxsat doirasida imkoniyat berish;
- **Ma’lumotlarni shifrlash** – ayniqsa HTTPS orqali xavfsiz uzatish;
- **Biometrik identifikatsiya** – foydalanuvchini yuz tasviri, barmoq izi yoki ko‘z qovog‘i orqali aniqlash. Bu ayniqsa onlayn banking va xavfsizlik tizimlarida keng qo‘llanmoqda;
- **WAF (Web Application Firewall)** – zararli trafikni filtrlaydi;
- **OWASP Top 10** – eng ko‘p uchraydigan 10 ta tahdidlar ro‘yxati va ularning oldini olish strategiyalari;
- **Xavfsizlik testlari** – doimiy tarzda penetratsiya testlari o‘tkazish.

4. Amaliy misollar va ilg‘or tajribalar

- **Facebook** – 2 bosqichli autentifikatsiya orqali xavfsizlikni oshirgan;
- **Google** – HTTPS’ni majburiy holga keltirgan;
- **PayPal** – tranzaksiyalar uchun biometrik autentifikatsiyani joriy etgan;
- **Ekspert tizimlarda yuzni tanib olish** – huquqni muhofaza qilish organlarida jinoyatchilarni aniqlashda foydalanilmoqda. Bu yerda yuz komponentalariga asoslangan tanish algoritmlari qo‘llaniladi, masalan, ko‘z, burun, og‘iz shakli, va ularning joylashuviga qarab aniqlash.

Biometrik tizimlar xavfsizligi bilan integratsiya. Biometrik identifikatsiya usullari, ayniqsa yuzni tanib olish texnologiyasi, web ilovalarda xavfsizlikni oshirishda muhim rol o‘ynaydi. Bu tizimlar foydalanuvchidan faqat parol emas, balki yuz tasvirini yoki barmoq izini so‘raydi. Yuzni komponentalar orqali tanish – ya’ni ko‘zlar, burun, og‘iz singari belgilarni alohida ajratish va analiz qilish orqali aniqlik darajasi oshadi. Ushbu tizimlar ko‘p bosqichli qaror qabul qilish modeliga asoslangan bo‘lib, lokal klassifikatorlardan olingan natijalarni integratsiyalash orqali umumiy qaror shakllanadi.

Xulosa. Web ilovalarning xavfsizligini ta'minlash – bu nafaqat dasturiy, balki tizimli va strategik yondashuvni talab qiluvchi jarayon. Har bir ishlab chiquvchi, tizim administrator va foydalanuvchi o‘zining rolini tushunib, xavfsizlik choralarini ko‘rishi kerak. Ayniqsa, biometrik autentifikatsiya va yuzni tanib olish texnologiyalarining web xavfsizlikka integratsiyasi bu sohadagi yutuqlarning amaliy isboti hisoblanadi.

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Integrated Control Technologies For Railway Automation Devices

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Abstract
Transport processes are naturally formalized through the use of mass service schemes, particularly when considering the study of automated technological complexes' operation, such as the administration and control of railway automation and telemechanics systems and devices. The allocation of the following elements forms the basis of the methodology used to describe the electronic document flow of technical documentation (EDMTD) in the automation and telemechanics economy: control levels, technological chains based on the chosen levels of hierarchy, and algorithms of technological processes (TP) of the EDMTD under study.
Keywords: railway automation and telemechanics, electronic document management, repair and technological section, signaling, centralization and blocking (SCB), database management.

The development of electronic document management systems for railway automation and telemechanics has shown the following tendencies in the modern era: greater information security requirements, shorter processing times for technical documents, and expanded functionality. By using contemporary methods and information systems, electronic document management systems can acquire these additional features.
Information and communication technology makes it possible to greatly increase the automation and telemechanics service's channels of interaction with the participating organizations. This helps to strengthen business-to-business cooperation based on mutual understanding and consideration of each party's interests. On the one hand, the automated system of accounting and control of railway automation and telemechanics (ASA-CRAT) is a comprehensive database that contains all of the installed equipment's details, including its history. However, ASA-CRAT is a client component that utilizes this database to implement different services' requirements [1-2].
An architecture diagram of the ASA-CRAT software package is displayed in figure 1. Using the database and the ASA-CRAT servers, this system complex will be dispersed via the repair and technological sections (RTS) of the Uzbekistan railways' signaling and communication distance.

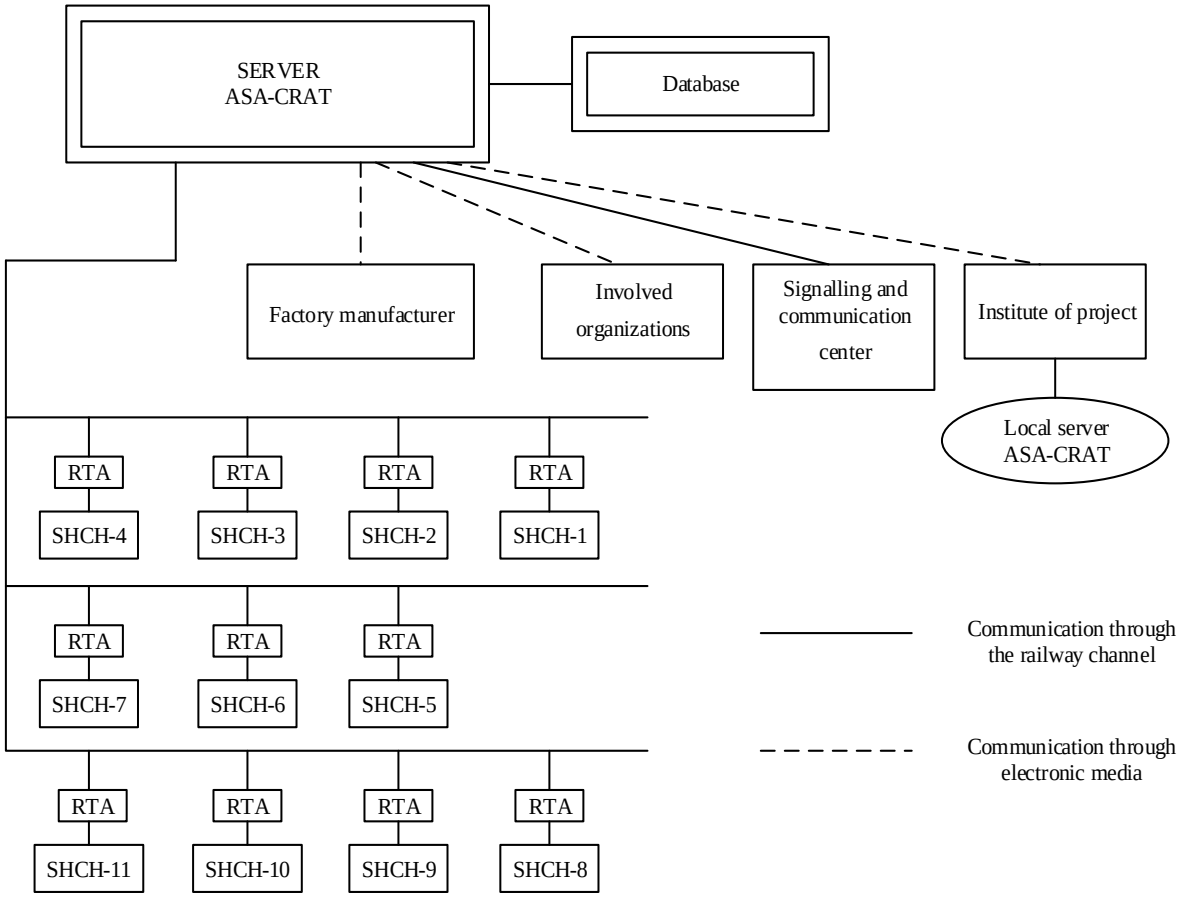

Fig.1. The ASA-CRAT program's architecture diagram

The general framework of the electronic document management system for technical documentation is suggested to employ ASA-CRAT.

The potential of current data transmission and communication lines are taken into consideration in the suggested technological structure. The ASA-CRAT server houses the database used for railway automation and telemechanics device accounting and monitoring. The database then communicates with the ASA-CRAT server [3].

In the upcoming years, significant documents will continue to be published, authorized, and distributed in paper form, indicating that the traditional paper flow of control and accounting of railway automation and telemechanics devices will not soon lose its significance. By combining both digital and traditional workflows, the system ensures continuity, flexibility, and adaptability during the transition phase. Over time, electronic documentation will enhance efficiency, reduce processing delays, and improve data accuracy across all service levels. Additionally, centralized storage and remote access capabilities will simplify long-term archiving and retrieval of technical records.

Experience has shown that without the use of information technology, the amount of effort involved in building and repairing railways today would be impossible. Fast data exchange, accumulation, processing, and analysis are not possible with paper carriers. It should go without saying that a computer can perform the majority of human labor, particularly well-algorithmic work. It is now particularly urgent to allocate resources to ensure the timely and high-quality execution of plans for overhaul, capital construction, and operation of signaling devices in connection with the establishment of an association of factories that produce signaling, centralization, and blocking (SCB) equipment for railway transport. This task can be carried out utilizing a set of tasks called "Automated system of accounting and control of railway automation and telemechanics devices" and databases of technical material created in the fields of automation and telemechanics in electronic form.

ASA-CRAT is designed to automate the accounting and control of railway automation and telemechanics devices. It also helps to organize the work of a technological and maintenance department and creates different alternatives for device replacement cards [4].

The application is utilized in the fields of telemechanics and railway automation. The program's primary features include:

– establishment and upkeep of a database that contains details on the location of a device's installation as well as the passports of particular gadgets;
– monitoring the movement of equipment in relation to write-offs, receipts, and periodic replacements;
– arranging for the replacement of gadgets while providing information that is required for technology;
– keeping an eye on how plans to replace equipment are being implemented;
– examination of centralization, blocking, and alarm device malfunctions;
– organizing the technology and repair work;
– issuing output documents and having the capability to look for devices in the database for arbitrary queries.

Furthermore, ASA-CRAT enables automated accounting for the replacement and relocation of equipment. On the one hand, ASA-CRAT is a comprehensive database that contains all of the installed equipment's details, including its history. The client component ASA-CRAT, on the other hand, uses this database to implement the requirements of different services.

Through the use of computer technologies for its receipt, storage, and processing, the ASA-CRAT aims to improve the efficiency of the processes necessary to maintain a database for the monitoring and accounting of railway automation and telemechanics devices, maintain signaling, centralization, and blocking at the station, and manage the economy remotely.

Automation and telemechanics services and the businesses connected to them can be made much more efficient by using electronic document flow for control and accounting of railway automation and telemechanics equipment in the form of ASA-CRAT.

The implementation of ASA-CRAT marks a key step toward modernizing railway automation and telemechanics documentation practices. Its integration enhances operational transparency, accuracy, and responsiveness across the entire maintenance and monitoring system. By combining centralized data storage with automated workflows, ASA-CRAT supports informed decision-making and long-term efficiency. Future developments should focus on expanding system capabilities, improving cybersecurity, and ensuring compatibility with emerging technologies.

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Utilising PHP Frameworks in Web Application Development

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Abstract
This article explores the significance of PHP frameworks in modern web application development, their architecture, security features, development process, and future trends. It emphasises how developers can build complex and scalable web applications efficiently and securely using PHP frameworks. It also presents a scientific perspective on the key advantages of frameworks, their modular software structure, built-in security mechanisms, and integration with modern technologies.
Keywords: PHP, framework, web application, MVC architecture, security, authentication, SQL injection, Cross-Site Scripting, Cross-Site Request Forgery, REST API, Laravel, Symfony.

Introduction In today's digital era, the rapid expansion of the internet and digital services has led to new opportunities and demands in web application development. Web applications now play a vital role not only in automating the operations of organisations and businesses but also in providing various services for everyday life. Consequently, the creation of high-quality and efficient web applications requires the use of modern programming methodologies and tools.
PHP is one of the most widely used server-side programming languages, serving as the foundation for many large-scale projects. Its strengths lie in its open-source nature, ease of learning, extensibility, and extensive library and framework support. Frameworks, in particular, enable developers to create robust, secure, and scalable web applications rapidly.
PHP frameworks are structured tools designed to standardise and accelerate software development. They help developers write modular code, manage data properly, reduce errors, and enhance security. Frameworks significantly improve the management and scalability of complex web applications.
This article analyses the concept, types, pros and cons, architecture, and practical usage of PHP frameworks. It also explores their effectiveness in development and security aspects.
Functions and Advantages of PHP Frameworks PHP frameworks offer the following core benefits:
1. **Code structure organisation**: Frameworks encourage modular and layered code architecture.
2. **Code reusability**: Common features and components are provided as libraries, reducing redundancy.
3. **Security**: Built-in protection mechanisms against threats like SQL injection, XSS, and CSRF.
4. **Rapid development**: Prebuilt templates and tools significantly speed up development.
5. **Community and support**: Popular frameworks are backed by active communities for bug fixes and updates.
6. **Flexibility**: Modules can be extended or customised based on project needs.

Necessity of Using Frameworks Writing a large-scale PHP project from scratch requires significant time and effort. Frameworks address these challenges:
1. Managing large volumes of code
2. Ensuring application security
3. Accelerating development

4. Improving code quality and reducing bugs

Detailed Analysis and Comparison of Popular PHP Frameworks

Laravel Laravel is among the most popular and modern PHP frameworks. Created by Taylor Otwell in 2011, it features intuitive syntax, advanced functionality, and strong community support.

- **Advantages**:
  - Easy to learn and use
  - Robust routing and middleware system
  - Blade templating engine for frontend integration
  - Artisan CLI for automation
  - Eloquent ORM for database handling
  - Real-time event and WebSocket support
  - Powerful authentication and security tools
- **Disadvantages**:
  - Can be heavy for very large projects
  - May require time to fully learn advanced features

Symfony Designed for large-scale applications, Symfony is known for its high flexibility and reusability.

- **Advantages**:
  - Modular architecture
  - Extensive configuration options
  - Strong security
  - Excellent documentation and community
  - Ideal for enterprise-grade projects
- **Disadvantages**:
  - Steeper learning curve
  - Overhead may be too much for small projects

CodeIgniter A lightweight, beginner-friendly framework ideal for rapid development.

- **Advantages**:
  - Very fast and lightweight
  - Minimal configuration
  - Easy to learn with good documentation
  - Suitable for small teams
- **Disadvantages**:
  - Less suitable for large or complex systems
  - Lacks some modern features

Yii A performance-oriented framework with strong security features.

- **Advantages**:
  - High speed and efficiency
  - XSS and CSRF protection
  - Gii code generator
  - Active Record for database abstraction
- **Disadvantages**:
  - Some documentation gaps
  - Moderate learning curve

Comparison Table

Framework	Learning Curve	Speed	Large Projects	Flexibility
Laravel	Easy–Medium	Medium	Good	High
Symfony	Hard	Medium	Excellent	Very High
CodeIgniter	Easy	High	Moderate	Medium
Yii	Medium	High	Good	Good

MVC architecture in Frameworks The Model-View-Controller (MVC) design pattern is widely adopted in modern frameworks. It separates application logic into three components:

- **Model**: Handles business logic and database interactions
- **View**: Displays user interfaces
- **Controller**: Manages user input and connects Model with View

Benefits of MVC

- Structured, readable code
- Component reusability
- Enables team-based development
- Easier debugging and testing
- Parallel development of frontend and backend

MVC Implementation in Frameworks Frameworks like Laravel (Eloquent ORM), Symfony (Doctrine), and Yii (Active Record) handle Models, while Blade and Twig serve as templating engines for Views. Controllers handle routing and request management.

Best Practices with MVC

- Maintain separation of concerns
- Keep business logic in Models
- Avoid logic in Views
- Controllers should be lean and handle routing

Security Features in PHP Frameworks Modern web applications manage sensitive personal and financial data. PHP frameworks offer built-in protections:

1. **SQL Injection Protection**: Using ORM and prepared statements (e.g., Laravel's Eloquent).
2. **XSS Protection**: Auto-escaping data in template engines.
3. **CSRF Protection**: CSRF tokens in forms (Laravel, Symfony).
4. **Authentication & Authorisation**: Built-in login and user management tools, such as Laravel Sanctum and Passport.
5. **Data Encryption**: Support for bcrypt, Argon2 algorithms.

Security Best Practices

- Always validate and sanitise user input
- Update frameworks and libraries regularly
- Enforce HTTPS
- Use strong passwords and 2FA
- Limit detailed error messages

Web Application Development Process with PHP Frameworks

1. **Planning and Requirement Analysis**
   - Define project goals and user needs
   - Determine technical specifications
   - Design database schema
   - Establish timeline
2. **Environment Setup**
   - Install PHP, MySQL/PostgreSQL
   - Install the framework (e.g., Laravel via Composer)

- Configure Apache/Nginx server
- Setup Git version control

3. **Structure Creation**
   - Automatically generated folders for MVC layers and routing
4. **Implementation**
   - **Model**: Define classes for database interaction
   - **Controller**: Handle requests and connect logic
   - **View**: Create user interface with HTML/CSS/JS or Blade
5. **Testing**
   - Unit and integration testing (e.g., PHPUnit)
   - Verify correctness, functionality, and security
6. **Deployment**
   - Migrate to production environment
   - Set file permissions and configurations
   - Create backups
7. **Maintenance and Updates**
   - Monitor performance
   - Fix bugs
   - Release updates

Future of PHP Frameworks and Trends

Current State Despite the growth of frontend frameworks and Node.js, PHP remains dominant for server-side development. Laravel and Symfony are widely used in large applications.

Trends

1. **Performance Improvements**: PHP 8 introduces JIT and improved syntax
2. **Asynchronous Programming**: Enables efficient, event-driven architectures
3. **Microservices Architecture**: Frameworks support API-first development
4. **Cloud Compatibility**: Easier containerisation with Docker and Kubernetes
5. **Integration with Modern Protocols**: RESTful API, GraphQL, WebSockets
6. **AI Integration**: Access to AI services like ChatGPT API

Methodology Analytical and comparative approaches were applied using technical documentation, scholarly sources, and industry publications. Developer feedback and practical use cases were considered to evaluate the role and outlook of PHP frameworks.

Conclusion PHP frameworks play a vital role in developing web applications by supporting modular and secure coding, faster development, and application stability. Their modern versions support asynchronous processing, microservices architecture, and cloud environments. With advanced security mechanisms and ease of integration, PHP frameworks continue to evolve as modern, efficient platforms for developers.

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Opportunities And Effectiveness Of Integrating Organic Chemistry Lessons With Environmental Sciences

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Abstract
This article explores the relevance, opportunities, and pedagogical effectiveness of integrating organic chemistry with environmental sciences in general secondary education schools. In particular, it analyzes the potential of designing lessons based on regional sources of organic pollution in Uzbekistan — such as pesticides, mineral and organic fertilizers, industrial waste, and household waste — to foster environmental awareness and responsibility among students. Through this integrated approach, students gain not only knowledge about the composition and properties of chemical substances, but also an understanding of their impact on the environment, ecological safety, and issues related to sustainable development. The article highlights modern teaching methods such as incorporating real ecological situations into lessons, conducting experiments, and using project-based and problem-solving tasks to enhance the effectiveness of instruction.
Keywords: Organic chemistry, environmental education, integration, pesticides, fertilizers, environment, school education, ecological safety, interdisciplinary connection.

Introduction

Nowadays, the intensification of global environmental problems, increasing chemical pollution of the environment, unsustainable use of natural resources, and the growing threats to human health demand the deep integration of the concept of sustainable development into the education system. In particular, the teaching of natural sciences — including organic chemistry — in an ecologically oriented and interdisciplinary manner has become one of the most pressing issues in general education schools [1].

In the Republic of Uzbekistan, the use of pesticides and chemical fertilizers in agriculture, industrial waste, and household pollutants are contributing to the organic contamination of soil, water, and air. From this perspective, enriching the organic chemistry curriculum with content based on local ecological problems can help foster environmental awareness and responsibility among students [2].

This study scientifically and pedagogically explores the opportunities, practical approaches, and effectiveness of integrating organic chemistry lessons with environmental sciences. The main objective is to support the development of not only students' chemical knowledge but also their ecological thinking, analytical reasoning, and conscious attitude toward the environment.

Main Body

The subject of organic chemistry is inherently interconnected with various processes occurring in the environment, and therefore, it must be taught in an integrated manner with environmental sciences. Such integration enhances students' interest in natural sciences, bridges theoretical knowledge with practical life, and helps foster ecological responsibility. Especially in Uzbekistan, with its unique geographical and economic characteristics, the combination of organic chemistry and environmental sciences increases the effectiveness of the educational process.

In lower grades, students are introduced to the basic concepts of substances and their properties. At this stage, it is important to present knowledge about the role of chemical elements and compounds in nature and their interactions with the environment from an

ecological perspective. This way, 7th and 8th-grade students begin to form initial concepts about environmental protection and nature conservation [3-4]

The topic of hydrocarbons studied in the 9th grade is closely related to ecology. Students learn in-depth about the environmental impact of burning alkanes, alkenes, and alkynes — which are used as fuels — and the resulting emission of carbon dioxide and nitrogen oxides. This topic enables students to analyze the environmental effects of industrial facilities and transport systems specific to Uzbekistan, thereby increasing their ecological awareness.

Photochemical reactions involving alkenes and alkynes can lead to the formation of smog and other harmful gases, exacerbating ecological problems. Studying air pollution in urban areas helps students develop the ability to assess environmental conditions critically [5].

In the 10th grade, the study of alcohols, phenols, and organic acids holds significant value for environmental education. Waste generated during the production of alcohols pollutes water bodies. Phenols, often present in industrial waste, negatively affect aquatic ecosystems. Within this context, students have the opportunity to analyze the ecological consequences of industrial pollution in major water sources like the Amu Darya and Syr Darya rivers.

Organic acids and their effects on human health can be linked to toxicology in biology, helping students develop skills to protect themselves from harmful chemicals. Thus, interdisciplinary integration enriches the content of the learning process.

In the 11th grade, topics such as polymers, plastics, and rubbers allow for a broader discussion of environmental problems. Synthetic materials are non-biodegradable and accumulate as waste, contributing to soil and water pollution. Therefore, it is essential to encourage students to think about reducing plastic waste and promoting recycling [6].

By studying the impact of plastic waste on the environmental condition of major cities in Uzbekistan, and examining waste management systems and ecological challenges, students better understand real-world issues, thereby enhancing their environmental consciousness.

In lessons on proteins, fats, and carbohydrates, students analyze the environmental issues arising from food production and processing. The impact of artificial additives, preservatives, and other substances on human health is studied in conjunction with biology [7].

Knowledge from biology about soil and its biocenosis links directly with the chemistry topics of fertilizers and pesticides. Improper use of pesticides and chemical fertilizers can lead to soil and water contamination, disrupting ecosystems. Students evaluate these processes and learn about measures to ensure ecological safety.

Connections with geography allow students to explore Uzbekistan’s natural resources and the environmental consequences of oil and gas extraction. This interdisciplinary approach gives students a broader understanding of the country’s ecological situation.

In natural science blocks, project-based work related to “Environmental Protection,” “Sustainable Development,” and “Climate Change” develops students' ability to identify ecological problems and find solutions.

Conclusion

During lessons, students not only acquire scientific knowledge but also develop environmental culture and a healthy lifestyle. This helps shape them into responsible and environmentally conscious individuals.

As a result, integrating organic chemistry with environmental sciences increases students’ interest in science, promotes analytical thinking, and raises ecological responsibility. It supports their ability to adhere to the principles of sustainable development in real life.

This approach demonstrates itself as an effective method of interdisciplinary integration in school education and reinforces students’ knowledge and skills related to environmental protection. Therefore, integrating organic chemistry lessons with environmental science should be widely implemented in schools.

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Изучение Русского Языка На Начальном Уровне: Методика И Эффективность

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Аннотация
В статье рассмотрены современные технологии и методы преподавания русского языка на начальном уровне, направленные на повышение эффективности образовательного процесса. Описаны цифровые платформы, мобильные приложения, мультимедийные ресурсы и геймификация, применяемые для обучения. Особое внимание уделено интеграции интерактивных методов в преподавание, анализу их воздействия на развитие языковых навыков у начинающих учеников и обучению через игровые элементы. Рассмотрены преимущества и вызовы, связанные с использованием технологий на начальном уровне, и предложены рекомендации для успешного внедрения инновационных методов.
Ключевые слова: современные технологии, преподавание русского языка, начальный уровень, геймификация, мультимедийные ресурсы, цифровые платформы, мобильные приложения.

Введение

Изучение русского языка на начальном уровне является важной и неотъемлемой частью образовательного процесса, как для носителей языка, так и для учащихся, изучающих его как иностранный. Этот этап обучения закладывает основы не только для дальнейшего освоения языка, но и для формирования способности к межкультурному общению, развитию когнитивных и аналитических навыков. В условиях глобализации, когда язык становится основным инструментом коммуникации в различных сферах жизни, от бизнеса до культуры, высококачественное преподавание русского языка на начальном уровне приобретает особое значение.

Методика преподавания русского языка на начальной стадии обучения претерпела значительные изменения за последние десятилетия, особенно с учетом внедрения новых образовательных технологий. Современные методы и подходы направлены на развитие у учащихся не только теоретических знаний, но и практических навыков использования языка в повседневных ситуациях. Важной составляющей современного процесса обучения является активное использование мультимедийных ресурсов, мобильных приложений, а также цифровых платформ, что делает процесс более интерактивным и доступным для учащихся.

На начальном уровне обучения важно создавать такой образовательный процесс, который бы способствовал не только формированию грамматических и лексических навыков, но и развитию мотивации к изучению языка, заинтересованности в процессе общения на русском. Эффективность обучения во многом зависит от того, насколько методики преподавания учитывают возрастные и индивидуальные особенности учащихся, их образовательные потребности и предпочтения. В этом контексте особую роль играют интерактивные и геймифицированные методы, которые активно используются в современных образовательных практиках.

Целью данной работы является исследование методов преподавания русского языка на начальном уровне, анализ их эффективности и влияние на образовательный процесс. В статье будет рассмотрено влияние современных технологий на методику преподавания,

а также предложены рекомендации для улучшения качества обучения на начальном уровне.

Исторический контекст

Изучение русского языка на начальном уровне имеет долгую и богатую историю, начиная с первых попыток организации обучения до современных подходов и технологий. Методика преподавания русского языка претерпела множество изменений, отражая как социально-экономические, так и культурные изменения в обществе.

Ранние этапы преподавания русского языка

Образование на территории России, включая обучение языкам, имеет многовековую традицию. В первые века после Крещения Руси, основное внимание уделялось религиозным текстам, и обучение русскому языку было связано в первую очередь с грамотностью и церковной деятельностью. В 17-18 веках появилась первая система светского образования, когда в учебные заведения начали внедряться и светские предметы, включая русский язык, но обучение было преимущественно ориентировано на знание литературного языка и правильное его употребление.

Классические методы XIX века

В XIX веке образование в России стало более доступным для широких слоев населения, и начали активно развиваться специальные методики преподавания русского языка, особенно в школах. Преподавание русского языка в то время было направлено на изучение грамматики, орфографии, синтаксиса и литературных произведений. Программа обучения была жестко структурирована, и основное внимание уделялось правилам языка. Методики того времени включали много повторений и заучивания, что позволяло сформировать у учеников крепкие основы языка.

Советский период и его влияние на методику

С 1917 года, когда в России была установлена советская власть, произошли значительные изменения в образовательной системе. Преподавание русского языка стало не только важным элементом общего образования, но и инструментом формирования социалистического мировоззрения. В Советском Союзе были разработаны новые методики, ориентированные на массовое обучение и грамотность. Программы обучения в школах были стандартизированы, а уроки русского языка стали обязательными в каждом учебном заведении. Основное внимание уделялось обучению стандартной речи, грамматике и литературным произведениям, что соответствовало социально-политическим требованиям того времени.

В этот период началась активная работа по распространению знаний среди населения, были созданы многочисленные пособия для учителей, методы преподавания были упрощены и систематизированы, что помогло обеспечить высокий уровень грамотности среди молодежи. Также активно внедрялся метод перевода и метод чтения в контексте грамматики.

Постсоветский период и современные подходы

После распада Советского Союза начались изменения в системе образования, и преподавание русского языка стало более ориентированным на интересы и потребности учащихся. Начало XXI века отметилось ростом интереса к индивидуализированным методам обучения, с учетом разных типов восприятия и стилей учебной деятельности. В это время в педагогике русского языка активно внедряются такие методы, как коммуникативный подход, который ставит акцент на практическое использование языка в реальных жизненных ситуациях.

Со временем методики преподавания русского языка стали более гибкими и адаптивными. Развитие технологий открыло новые возможности для изучения языка, таких как мультимедийные материалы, интернет-ресурсы и мобильные приложения. Преподавание на начальном уровне также претерпело изменения — внимание уделяется развитию речевых навыков, восприятию устной речи, а также

взаимодействию в учебном процессе, что способствует более эффективному освоению языка.

Современные тенденции

Сегодня методики преподавания русского языка на начальном уровне становятся более разнообразными и мультимодальными. В процессе изучения языка важное место занимает активное использование цифровых технологий, онлайн-платформ и приложений для обучения. Учащиеся могут изучать не только грамматику и лексику, но и улучшать навыки общения с использованием мультимедийных материалов, игр, онлайн-курсов и социальных сетей.

Важно отметить, что методики на начальном уровне обучения русского языка сейчас ориентированы на интерактивность, практическое использование языка и развитие коммуникативных навыков, что требует от преподавателей использования инновационных технологий и подходов, направленных на создание ситуации успешного освоения языка.

История преподавания русского языка на начальном уровне прошла через несколько этапов, начиная от церковного образования и классических методов до современного подхода, основанного на коммуникативной методике и использовании технологий. Каждый из этапов развития методики обучения русского языка отражал социальные и культурные изменения, происходившие в обществе, и соответствовал потребностям того времени. Современные методики ставят на первое место активное взаимодействие учащихся с языковым материалом, что позволяет повысить их языковую грамотность и коммуникативные навыки.

Роль современных технологий в преподавании русского языка

Современные технологии оказывают значительное влияние на преподавание русского языка на начальном уровне. Они позволяют сделать процесс обучения более доступным, увлекательным и эффективным. Рассмотрим ключевые аспекты, в которых технологии играют важную роль:

Цифровые платформы и мобильные приложения

Платформы, такие как Moodle, Google Classroom и специализированные приложения, позволяют учащимся взаимодействовать с учебным материалом в удобном формате. Мобильные приложения, такие как «Орфограмма», «Грамота.ру», активно помогают учащимся тренировать правописание и расширять словарный запас. Эти инструменты позволяют изучать язык в любое время и в любом месте, что особенно важно для начинающих учеников.

Геймификация

Геймификация — это процесс внедрения элементов игры в образовательный процесс. На начальном уровне это особенно эффективно, поскольку дети и начинающие ученики воспринимают обучение как игру. Введение игровых элементов, таких как баллы, уровни, и конкурсы, помогает учащимся заинтересоваться процессом обучения, делает его более динамичным и увлекательным. Применение игровых платформ и викторин способствует улучшению грамматических навыков, правописания и навыков общения.

Мультимедийные ресурсы

Мультимедийные средства, такие как видеоуроки, анимации и интерактивные упражнения, позволяют ученикам воспринимать материал через разные каналы: зрительный, слуховой и даже тактильный. Это особенно полезно для детей, у которых могут быть разные предпочтения в восприятии информации. Мультимедийные материалы делают изучение языка более живым и стимулируют интерес к предмету.

Использование онлайн-курсов и вебинаров

Современные онлайн-курсы предоставляют возможность обучаться в любое время, что дает учащимся гибкость в обучении. Вебинары и видеоконференции дают преподавателям возможность проводить занятия в дистанционном формате, делая

уроки доступными для студентов из разных регионов и с различными уровнями подготовки.

Методы преподавания на начальном уровне

Изучение русского языка на начальном уровне требует особого подхода, поскольку ученики еще не обладают достаточным языковым запасом и навыками для глубокого анализа. Интерактивные и инновационные методы позволяют учащимся активно вовлекаться в процесс, делать первые шаги в изучении языка в увлекательной форме:

Интерактивные задания

Использование цифровых платформ и мобильных приложений для создания интерактивных заданий позволяет учащимся практиковать базовые языковые навыки, такие как чтение, письмо, аудирование и говорение. Преподаватели могут использовать онлайн-игры, викторины, кроссворды и другие формы интерактивных упражнений, чтобы учить детей грамматике, лексике и орфографии.

Тематические проекты

Для начинающих учащихся важна практика общения и применения новых знаний на практике. Тематические проекты, такие как создание презентаций, видеороликов или простых текстов, помогают учащимся закрепить лексику и грамматику, развивая их творческие и коммуникативные навыки.

Таблица 1: Такие тематические проекты помогают ученикам интегрировать знания в практическую деятельность, повышая их мотивацию и заинтересованность в процессе обучения.

Тип тематического проекта	Цель	Описание	Результат
Создание презентаций	Закрепление лексики и грамматики через визуализацию	Учащиеся создают презентации на заданную тему, используя новые слова и фразы.	Развитие навыков использования лексики в контексте и укрепление грамматических навыков.
Создание видеороликов	Развитие коммуникативных навыков и уверенности в использовании языка	Студенты снимают видеоролики, рассказывая истории или объясняя процессы на русском языке.	Улучшение навыков говорения и аудирования, а также уверенности в языке.
Написание простых текстов	Закрепление грамматических конструкций и расширение словарного запаса	Написание небольших текстов (рассказов, эссе, диалогов) на основе изученной темы.	Развитие навыков письменной речи и структурирования текста на русском языке.

Заключение

Изучение русского языка на начальном уровне — это важный и ответственный процесс, который закладывает основы дальнейшего освоения языка и формирования языковой культуры. Методика преподавания русского языка на начальном этапе играет ключевую роль в создании эффективного образовательного процесса, обеспечивая грамотное и системное усвоение грамматических правил, лексики, а также развитие речевых навыков у учащихся.

Современные подходы к обучению русского языка включают использование инновационных методов и технологий, таких как цифровые платформы, мультимедийные ресурсы, мобильные приложения и геймификация. Эти инструменты значительно повышают мотивацию учащихся, делают процесс обучения более интересным и увлекательным, а также способствуют развитию коммуникативных навыков. Адаптация образовательного процесса под современные требования и технологии помогает не только улучшить качество знаний, но и развить у учеников критическое мышление, самостоятельность и творческое восприятие языка.

Тем не менее, важно помнить, что использование новых технологий не должно вытеснять традиционные методики. Совмещение классических подходов и инновационных методов в обучении русского языка способствует более глубокому освоению материала, обеспечивая комплексный подход к языковому обучению. Ключевым фактором успеха является правильный баланс между теоретическими знаниями и практическим применением языка, а также способность преподавателя эффективно интегрировать разнообразные методы обучения в единый образовательный процесс.

Таким образом, успешное преподавание русского языка на начальном уровне невозможно без учета как традиционных, так и современных педагогических технологий, что требует постоянного совершенствования методик и подходов, направленных на повышение эффективности обучения и достижение высоких результатов в освоении языка.

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The Role Of Bloom Taxonomy In Consistent Teaching Of English

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Keywords: consistency, innovative technology, Bloom's taxonomy, pragmatic competence, taxonomy stages, communicative competence.

Currently, higher education in Uzbekistan is going through a period of unprecedented changes. Undoubtedly, the main factor of these changes is the impact of innovative technologies on the educational process. Recognition of learning foreign languages as a priority direction of education policy in our country, improvement of the process of training future English language teachers, regular improvement of the quality and level of teaching foreign languages, in order to master the requirements for graduates that meet national and world standards, the President of the Republic of Uzbekistan dated May 19, 2021 «Measures to bring the activity of popularizing the study of foreign languages in the Republic of Uzbekistan to a qualitatively new level Decision No. PQ-5117 on In accordance with the decisions of the Cabinet of Ministers of the Republic of Uzbekistan dated January 19, 2022 No. 34 on additional measures to improve the study of foreign languages, measures to popularize the study of foreign languages in order to effectively implement the measures, it was aimed to attract qualified pedagogues in this direction and increase the interest of the population in learning foreign languages[1]. According to him, the legal and normative foundations of the system of training foreign language teachers with strong competitive, communicative competence are the study of international scientific and theoretical ideas and foreign experiences in improving the quality of education, the competence of pedagogues, philologists, sociologists of our country, professional competence, the essence of practical tasks to raise independent and distance education skills to high levels is one of the important goals of training competitive mature specialists.

Teachers and scientists believe that the traditional forms of education are outdated, and it is necessary to introduce innovative teaching technologies to attract the attention of students. Today, many higher education institutions are moving to use innovative technologies in the educational process, as they have a number of advantages: encouraging active teaching; quick feedback; establishing communication between the teacher and students; forming "unconventional" thinking in students; encouraging cooperation between students; encouraging different methods of learning. Based on the above, we can conclude that innovative technologies have fundamentally changed the old "teaching and learning" paradigm. In this example of teaching, the role of students is more important than that of teachers. The main goal of innovative technologies is to prepare a person for life in a constantly changing and developing society.

One such technologist is Blum's taxonomy, and these levels of taxonomy are also important in the language teaching system. The taxonomy of educational goals based on the levels of – cognitive activity, a system of questions and assignments founded by the famous American psychologist and pedagogue Benjamin Blum, is sufficiently widespread in the modern world of education[2]. The taxonomy of educational goals is the systematization of students' concrete actions, which indicate a certain level of mastery, by sequentially placing objects in the content that become more complex based on natural interdependence. For many years, on the basis of teaching foreign languages, it was content only with acquiring linguistic competence, in

[1] Decision of the President of the Republic of Uzbekistan dated May 19, 2021 No. PQ5117 “On measures to bring the activity of popularizing the study of foreign languages in the Republic of Uzbekistan to a qualitatively new level. ” 5426736
2. Resolution No. 610 of the Cabinet of Ministers of the Republic of Uzbekistan “On measures to further improve the quality of teaching foreign languages in educational institutions
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detail, learning grammar and vocabulary. However, after the introduction of the communicative approach, knowing the function of these language units is defined as the task of language teaching, which requires active manifestation of social and pragmatic competencies in productive speech. In this way, misunderstandings in communicative communication were prevented, and the stereotypes of intercultural communication were also widely developed[3]. Blum's taxonomy is a modern educational tool in the development of discourse competence, which is part of pragmatic competence. Blum's taxonomy plays an important role in the development of students' high-level thinking skills, especially in the language teaching process. This taxonomy allows students to develop a high level of cognitive activity, such as understanding, analyzing, synthesizing, and evaluating their thoughts. This, in turn, strengthens the communicative competence of students, that is, it increases their ability to use the language correctly and effectively not only grammatically, but also for social and pragmatic purposes.

Blum's taxonomy is a very effective approach to the systematic development of students' cognitive process. In teaching English as a foreign language, with the help of taxonomy, students acquire knowledge in depth and learn to use it in practice through various creative projects and presentations[4]. Scientific studies show that based on Blum's taxonomy, students' learning process improves and their cognitive abilities develop significantly. For example, studies conducted by Krathwohl and Anderson in the United States found positive effects of Blum's taxonomy on cognitive development[5]. According to the results of this study, students' critical thinking skills have increased and the process of deeper acquisition of knowledge has accelerated. In the conditions of Uzbekistan, it is possible to achieve consistent development of students' knowledge by widely implementing this approach. Foreign experiences show that the effectiveness of Blum's taxonomy is especially high in the development of creative and independent thinking skills. Students not only acquire knowledge, but are also directed to develop it in new contexts and create new ideas. This process deepens the level of students' learning and encourages them to think critically and creatively.

The stages of Blum's taxonomy are important in the educational process, because it helps to clearly and systematically define educational goals. Also, through these stages, students develop not only knowledge, but also the skills of deep understanding and practical application. In addition, taxonomy serves to gradually develop the level of thinking, that is, students gradually move from simple knowledge to complex analysis and creativity. At the same time, it becomes easier to determine the evaluation criteria based on this system, which ensures fair and accurate evaluation. Another important point is that Blum's taxonomy serves as an important tool in effective planning of the educational process and careful organization of lessons. Finally, through this taxonomy, students develop high-level thinking skills such as analysis, evaluation, and creativity. In addition, the stages of Blum's taxonomy serve to effectively organize the educational process, because through them the educational goals are clearly defined and students gradually develop the levels of thinking. At the same time, this taxonomy helps students to develop high-level skills such as knowledge assessment, analysis and creative thinking.

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The Role Of Language Identity In Sociolinguistics

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Abstract
This article explores the significance of linguistic consistency in understanding individual identity and the interplay between language and society. It discusses the various traits of language, such as productivity and cultural transmission, and how they shape communication and social structures. The role of language in conveying both literal and non-literal meanings is highlighted, showcasing its power in reflecting identity and social status. Ultimately, language is shown to be a fundamental aspect of human existence, serving as a tool for communication, identity formation, and societal dynamics.
Keywords: linguistic consistency, individual identity, language and society, productivity, cultural transmission, communication, social structures, literal and non-literal meanings, identity formation, societal dynamics

Introduction

Language is a powerful tool that carries messages and shapes our identities. Experts have identified various traits of language, such as productivity, dualism, and cultural transmission. Through language, individuals convey both literal and non-literal meanings, reflecting their identity and social status. This article explores the significance of linguistic consistency in understanding individual identity and the interplay between language and society. Messages are carried by language. Language, according to some experts, is a system of arbitrary voice symbols. Yule (2006) lists a few traits of language, including productivity, dualism, arbitrariness, and cultural transmission. People's mental lexicons contain a million vocabularies, which makes language productive. It is only necessary to recall the vocabulary when speaking the words.

Moreover, language has two meanings: the meaning of the speaker and the meaning of the language, according to Lyons. Figurative language, particularly non-literal meanings, is one sort of meaning that the speaker conveys. The literal definition of the word is what it truly signifies; it is something else entirely means.

Literature review

In addition, a person's speech pattern and linguistic usage reveal who they are. As stated by Ward Haugh, "...language is a profound indicator of identity, more potent by far than cultural artifacts such as dress, food choices, and table manners," language is one of the factors that determines how people behave in society. Linguistic consistency is an important concept that should be thoroughly studied because it is thought to be a powerful indicator of an individual's identity. Language and community are inseparable in a society. According to Wardhaugh (2006), "there is some relationship between language and society such as; social structure influences or determines the linguistic structure and behavior, linguistic structure and behavior may influence the social structure, society and language may influence each other," language plays the role of a means of conveying the idea in communication. According to Meyer (2009), language plays a place in the semiotic system. It suggests that human communication occurs not only through spoken language but also through nonverbal cues, visual arts, attire, and music. Language contains distinct and universal qualities that turn into one of the natural speaker's identities. Furthermore, language has two functions: the transactional view, which is used to represent content, and the interactional view, which is used to describe interpersonal relationships and attitudes.Whereas the interactional perspective focuses on preserving social relationships and depicts interpersonal relationships, the transactional view emphasizes content as the primary component of communication

Furthermore, language serves two purposes: the referential function and the effective impact. The referential role is associated with what objects and ideas are called and how events are described while effective function is concerned with the ways we address according to power and social status. Language functions can help people communicate so they can convey knowledge, uphold relationships, and assert their authority.

In most of communication, indirectness is frequently used. Figurative language is one method of indirectness , it requires special or additional cognitive processes to understand. The use of figurative language constitutes a clear example to illustrate the deconstructive processes in which individuals are involved when using the language. Figurative language is a new perspective on meaning that is present in many conversation forms and differs from the structural meaning that a word conveys. Since both speakers are aware of the meaning they produce together, their proximity may encourage them to utilize figurative language. Figurative language recreates meaning when writing a poem, a play, a story, or when taking place in a conversation, speech, and/or lecture. It is made very apparent that figurative language occurs in conversation as well. Figurative language can't be employed in every conversation since it suggests a different meaning for the term; it depends on the context and the interlocutor's background.

When someone uses metaphorical language with someone they don't know well, miscommunication might occur. Furthermore, the person who is angry may become even more enraged if it is said in that context. Figurative language is typically produced in a particular context.

RESULTS AND DISCUSSION

There are numerous varieties of metaphorical language such as metaphors, personifications, paradoxes, similes, synecdoche, antitheses, hyperboles, metonymies, allegories, and idioms. A simile is generally used in a sentence to make direct comparisons between two or more nouns and this is done with the use of words such as ‘like’ or ‘as’. The general idea of using a simile with the word ‘as’ is by using a noun that is known for a particular quality. For example: as proud as a peacock, as busy as a bee and so on. A simile helps the reader to visualize, understand and have a better conception of the quality of the nouns being compared. Individuals use similes to draw similarities between things by associating the qualities and essences of one item with another by utilizing phrases like, as such as. The usage of a name to denote a term is known as metonymy. Metonymy is defined as "a figure of speech which is characterized by the substitution of a term naming an object closely associated with the word in mind. Uzbek speakers express human behavior more figuratively and similes show the linguistic and cultural characteristics of the Uzbek language. Uzbek speakers use words denoting various animals to describe human traits more often. For example: itday sadoqatli, molday befahm, musichaday beozor, eshakday qaysar, qo‘yday yuvosh . In English :Loyal as a dog, stupid as a fox, innocent as lamb/dove/, stubborn as a donkey, meek as a sheep (analogies related to character); itday ishlamoq, echkiday sakramoq, toshbaqaday sudralmoq, ilonday chaqmoq, bulbulday sayramoq, jo’jaxo’rozday bo’ynini cho’zmoq (work like a dog, jump like a goat, crawl like a turtle, flash like a snake, dance like a nightingale, fight like small rooster) (similes involving action)

An idiom is a phrase that has a unique meaning that differs from the terms' typical meanings. According to Araya (2008), a structure does not conceive meaning; it might be interpreted differently depending on the culture of the society.

An allegory is a narrative, play, poetry, artwork, or other creative piece in which the people and situations symbolize specific traits or concepts pertaining to politics, religion, or morality. In summary, figurative language has a wide range of meanings that speakers can employ in their discourse for a variety of objectives.

CONCLUSION

In conclusion, language is a multifaceted system that plays a crucial role in communication and identity formation. Linguistic consistency serves as a powerful indicator of an individual's identity, while language and society are intertwined in shaping behavior and social structures. Understanding the functions of language, from conveying knowledge to asserting authority, highlights its importance in human interaction and societal dynamics. Language is not only a means of communication but also a reflection of cultural values and social relationships, making it a fundamental aspect of human existence.

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Ecotourism Development Opportunities And Sustainability Principles In Uzbekistan

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Abstract
This article analyzes the opportunities for the development of ecotourism in Uzbekistan and the compatibility of the principles of sustainability. Ecotourism is of great importance not only as a means of ensuring environmental protection, but also as a means of increasing the income of the population living in rural areas, promoting cultural heritage and strengthening economic activity. The natural and geographical opportunities of Uzbekistan, including mountainous areas, desert landscapes, biosphere reserves and national parks, have great potential for ecotourism activities. The article covers the principles of sustainability - namely, ecological balance, rational use of resources, ensuring the participation of local communities and developing infrastructure on an environmentally friendly basis. The role of public policy, the private sector, and international experience in the development of ecotourism is also assessed, and proposals for promising areas are developed.
Keywords: ecotourism, sustainable development, natural resources, local communities, biosphere reserves, ecological balance, tourism infrastructure, rural tourism.

Annotatsiya: Ushbu maqolada O‘zbekistonda ekoturizmni rivojlantirish imkoniyatlari va barqarorlik tamoyillarining o‘zaro uyg‘unligi tahlil qilinadi. Ekoturizm nafaqat ekologik muhofazani ta’minlash, balki qishloq hududlarida yashovchi aholi daromadini oshirish, madaniy merosni targ‘ib qilish va iqtisodiy faollikni kuchaytirish vositasi sifatida muhim ahamiyat kasb etadi. O‘zbekistonning tabiiy-geografik imkoniyatlari, jumladan, tog‘li hududlar, cho‘l landshaftlari, biosfer qo‘riqxonalari va milliy bog‘lar ekoturistik faoliyat uchun katta salohiyatga ega. Maqolada barqarorlik tamoyillari - ya’ni ekologik muvozanat, resurslardan oqilona foydalanish, mahalliy hamjamiyatlar ishtirokini ta’minlash va infratuzilmani ekologik jihatdan toza asosda rivojlantirish masalalari yoritiladi. Shuningdek, ekoturizmni rivojlantirishda davlat siyosati, xususiy sektor va xalqaro tajribaning o‘rni baholanadi hamda istiqbolli yo‘nalishlar bo‘yicha takliflar ishlab chiqiladi.
Kalit so‘zlar: ekoturizm, barqaror rivojlanish, tabiiy resurslar, mahalliy hamjamiyat, biosfer qo‘riqxonalari, ekologik muvozanat, turizm infratuzilmasi, qishloq turizmi.

Kirish.
Hozirgi davrda turizm sohasida ekologik yondashuvlarning ahamiyati ortib bormoqda. Ayniqsa, barqaror rivojlanish maqsadlari kontekstida ekoturizm nafaqat dam olish vositasi, balki tabiatni muhofaza qilish, madaniy merosni asrash va mahalliy iqtisodiyotlarni faollashtirishning muhim yo‘nalishiga aylanmoqda. O‘zbekiston geoiqtisodiy jihatdan Markaziy Osiyoning muhim turistik markazlaridan biri bo‘lib, boy tabiiy manzaralari, tog‘li hududlari, cho‘l zonalari va muhofaza etiladigan tabiiy ob’ektlari bilan ekoturizmni rivojlantirish uchun katta salohiyatga ega. Shu bilan birga, ekoturizm sohasini rivojlantirish orqali qishloq hududlarida yangi ish o‘rinlarini yaratish, aholi bandligini ta’minlash, ekologik xabardorlikni oshirish imkoniyatlari vujudga keladi. Mavzuning dolzarbligi, ayniqsa, global iqlim o‘zgarishlari va tabiiy resurslardan oqilona foydalanish masalalari kuchayib borayotgan bir sharoitda, ekologik jihatdan barqaror turizm modellarini ishlab chiqish zarurati bilan bevosita bog‘liqdir.
So‘nggi yillarda O‘zbekistonda ekoturizmni rivojlantirish bo‘yicha bir qator davlat dasturlari va qonuniy hujjatlar qabul qilindi. Jumladan, “Turizm to‘g‘risida”gi Qonun, Prezidentning 2019-yil 5-yanvardagi PQ–4095-sonli qarori (ekoturizmni qo‘llab-quvvatlash bo‘yicha), “Yashil makon”, “Har bir oila – tadbirkor” kabi dasturlarda ekoturistik faoliyatga oid bandlar mavjud. Shunga

qaramay, amaliyotda turizmning ekologik yo‘nalishi yetarlicha rivojlanmagan. Qonun hujjatlarining joylardagi ijrosi sust, infratuzilma va ekoturizm bozorini tashkil etish bo‘yicha mexanizmlar noaniq. Ko‘plab tabiiy ob’ektlar ekoturistik xizmatlarga tayyor emas, mahalliy aholi va xususiy sektorning jalb qilinishi cheklangan. Bu esa, mavjud salohiyatdan to‘laqonli foydalanilmasligi va resurslar samaradorligini pasaytiruvchi omil bo‘lib qolmoqda.

Ushbu maqolaning asosiy maqsadi - O‘zbekistonda ekoturizmni rivojlantirish imkoniyatlarini tahlil qilish hamda barqarorlik tamoyillariga asoslangan ekoturistik modelni ishlab chiqishga ilmiy asos yaratishdan iborat. Tadqiqotda ekologik turizm sohasining hozirgi holati, mavjud tabiiy salohiyat va infratuzilma holati baholanadi, shuningdek, mavjud muammolar aniqlanib, ularni bartaraf etish bo‘yicha takliflar ishlab chiqiladi.

Maqolada quyidagi vazifalarni hal qilish ko‘zda tutilgan:

- O‘zbekistonda ekoturizm rivojining nazariy asoslarini tahlil qilish;
- Amaldagi huquqiy-me’yoriy hujjatlarni o‘rganish va ularning samaradorligini baholash;
- Ekoturizm uchun qulay hududlarni aniqlash va ularning salohiyatini baholash;
- Barqarorlik tamoyillarini ekoturizmga integratsiya qilish mexanizmlarini taklif etish;
- Mahalliy aholini jalb qilish, infratuzilmani rivojlantirish va ekologik boshqaruvni kuchaytirishga oid tavsiyalar ishlab chiqish.

Ushbu tadqiqotning obyekti sifatida O‘zbekiston Respublikasida ekoturizm sohasining rivojlanish jarayonlari, uni tartibga soluvchi huquqiy-me’yoriy bazalar, infratuzilmaviy holat hamda barqarorlik tamoyillarining amaliy qo‘llanilishi olinadi.

Tadqiqot predmetini esa mamlakatda mavjud tabiiy-geografik imkoniyatlardan samarali foydalanish, ekoturistik xizmatlar ko‘rsatish mexanizmlari, mahalliy hamjamiyatlarning ishtirokini kuchaytirish va ekologik xavfsizlikni ta’minlash asosida ekoturizmni barqaror rivojlantirish yo‘llari tashkil etadi. Shuningdek, ekoturizm orqali qishloq hududlarida bandlikni oshirish, turizmga oid infratuzilmani ekologik mezonlarga asoslangan holda takomillashtirish ham ushbu tadqiqot doirasida o‘rganiladi.

Ekoturizm - bu atrof-muhitga zarar yetkazmasdan, tabiiy va madaniy resurslardan barqaror foydalanish asosida sayohat qilishni anglatadi. U an’anaviy turizmga nisbatan chuqurroq ekologik va ijtimoiy maqsadlarni o‘z ichiga oladi. Ekoturizmning asosiy tamoyillari - bu tabiiy resurslarni muhofaza qilish, mahalliy hamjamiyatlar manfaatlarini hisobga olish va turistlarda ekologik xabardorlikni shakllantirishdir.

Ekoturizmning nazariy asoslari. Nazariy jihatdan ekoturizm barqaror rivojlanish konsepsiyasi bilan bevosita bog‘liq bo‘lib, turizm orqali ekologik muvozanatni saqlash, iqtisodiy daromad olish va ijtimoiy farovonlikni oshirishga xizmat qiladi. Bu yo‘nalish XX asr oxiridan boshlab UNESCO, UNWTO, WWF kabi xalqaro tashkilotlar tomonidan qo‘llab-quvvatlab kelinmoqda. Ekoturizm ko‘pincha ekologik jihatdan sezgir hududlarda, biosfer qo‘riqxonalari, milliy bog‘lar va tog‘li zonalarda rivojlanadi. Uning asosida “mas’uliyatli sayohat” g‘oyasi yotadi, ya’ni har bir turist o‘z harakati bilan tabiatga e’tiborli bo‘lishi lozim.

O‘zbekistonda ekoturizm sohasining holati. O‘zbekiston ekoturizmni rivojlantirish uchun tabiiy-geografik salohiyati yuqori bo‘lgan davlatlardan biri sanaladi. Mamlakat hududining katta qismi tog‘lar, cho‘llar, daryo vodiylari, biosfer qo‘riqxonalari va milliy bog‘lar bilan qamrab olingan. Jumladan, Zaamin milliy bog‘i, Qizilqum biosfer rezervati, Surxon davlat qo‘riqxonasi kabi tabiiy ob’ektlar ekoturistik sayohatlar uchun keng imkoniyatlar yaratadi.

So‘nggi yillarda davlat tomonidan qator huquqiy va tashkiliy choralar ko‘rilmoqda. “2022–2026-yillarda turizmni rivojlantirish strategiyasi”, “Yashil makon” loyihasi va “Ekoturizmni qo‘llab-quvvatlash bo‘yicha qarorlar” bu sohaga bo‘lgan e’tiborni ko‘rsatadi. Shu bilan birga, xususiy sektorning ishtiroki ortib borayotganiga qaramay, ekoturistik infratuzilma, ekologik xizmatlar sifati, kadrlar salohiyati va marketing strategiyalarida hanuz muayyan muammolar mavjud. Shu bois, ekoturizm sohasi hali to‘liq shakllanmagan, lekin yuqori salohiyatli rivojlanish bosqichida deb baholash mumkin.

O‘zbekistonda ekoturizm salohiyatiga qaramay, uning rivojlanishida bir qator tizimli muammolar mavjud. Birinchidan, ekologik infratuzilmaning yetishmasligi, ayniqsa tog‘li va chekka hududlarda transport, xizmatlar va axborot vositalarining zaifligi seziladi. Ikkinchidan, mahalliy aholi va xususiy sektor vakillarining ekologik savodxonligi va motivatsiyasi past darajada. Bundan tashqari, marketing strategiyalarining yetarli darajada ishlab chiqilmagani va ekologik standartlarning amaliyotda qo‘llanilmasligi ham to‘siqlardan hisoblanadi. Bu muammolarni bartaraf etish uchun kompleks yondashuv talab etiladi.

Ekoturizmda barqarorlik tamoyillarini integratsiyalash tabiiy muhitni saqlash va uzoq muddatli rivojlanishni ta’minlashda muhim rol o‘ynaydi. O‘zbekiston sharoitida bu tamoyillarni amaliyotga tatbiq etish — ekologik toza infratuzilma qurish, mahalliy aholini jalb qilish, va tabiiy resurslardan oqilona foydalanish orqali amalga oshiriladi. Shuningdek, ekologik ta’lim va xabardorlikni oshirish orqali turistlar va xizmat ko‘rsatuvchi subyektlarning mas’uliyatini kuchaytirish mumkin. Bu esa ekoturizmni barqaror rivojlantirishga zamin yaratadi.

Xulosa va takliflar. Yuqoridagi tahlillar asosida xulosa qilish mumkinki, O‘zbekistonda ekoturizmni rivojlantirish bo‘yicha muhim salohiyat mavjud bo‘lsa-da, mavjud imkoniyatlardan to‘laqonli foydalanish uchun tizimli yondashuv zarur. Ekoturizmning rivojlanishi faqat turizm sektori doirasida emas, balki ekologik, iqtisodiy va ijtimoiy barqarorlik tamoyillari bilan bevosita bog‘liq. Bu yo‘nalishda davlat siyosatini yanada kuchaytirish, xususiy sektor ishtirokini rag‘batlantirish va mahalliy aholini faol jalb qilish dolzarb masalalardan biridir.

Shu asosda quyidagi takliflar ilgari suriladi:

- Ekoturizm infratuzilmasini ekologik mezonlarga asoslangan holda rivojlantirish;
- Mahalliy aholini tayyorlash va ular ishtirokidagi kichik loyihalarni qo‘llab-quvvatlash;
- Tabiiy ob’ektlar atrofida barqaror boshqaruv tizimini yaratish;
- Ekologik ta’limni kuchaytirish va axborot-resurs markazlarini tashkil etish;
- Ekoturizmga oid yagona raqamli platformani ishlab chiqish.
- Shu orqali ekoturizm O‘zbekiston iqtisodiyotida muhim tarmoq sifatida shakllanishi va xalqaro bozorlarda raqobatbardosh ekoturistik yo‘nalishga aylanishi mumkin.

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Noun Word-Groups In The English Language

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The phrase is a combination of two or more notional words which is a grammatical unit but is not an analytical form of some word. The main difference between the phrase and the sentence is in their linguistic function. The phrase is a nominative unit, the sentence is a predicative one.
Nomination is naming things and their relations. A nominative unit simply names something known to everybody or a majority of native language speakers, recalling it from their memory, e.g.: a book, a departure. A phrase represents an object of nomination as a complicated phenomenon, be it a thing, an action, a quality or a whole situation.
Words are the constituent elements of the next rank, phrases. At the phrase rank, we discover that it is possible to analyze each structure in more than one way. To study this phenomenon more closely, we will look at phrase structure in English. English is a language with five classes of phrases, noun phrases, verb phrases, adjective phrases, adverb phrases, and prepositional phrases. Word-groups can be classified on the basis of several principles:
a) According to the type of syntagmatic relations: coordinate (you and me), subordinate (to see a house, a nice dress), predicative (him coming, for him to come),
b) According to the structure: simple (all elements are obligatory), expanded *(to read and translate the text* – expanded elements are equal in rank), extended(a word takes a dependent element and this dependent element becomes the head for another word: *a beautiful flower - a very beautiful flower).* Subordinate word-groups are based on the relations of dependence between the constituents. This presupposes the existence of a governing.
Element which is called the head and the dependent element which is called the adjunct (in noun-phrases) or the complement (in verb-phrases).
According to the nature of their heads, subordinate word-groups fall into noun-phrases (NP) - *a cup of tea,* verb phrases (VP) - *to run fast, to see a house,* adjective phrases (AP) - *good for you,* adverbialphrases (DP) - *so quickly,* pronoun phrases (IP) - *something strange, nothing to do.* The formation of the subordinate word-group depends on the valency of its constituents. Valency is a potential ability of words to combine. Actual realization of valency in speech is called combinability.
Noun word-groups are widely spread in English. This may be explained by a potential ability of the noun to go into combinations with practically all parts of speech. A noun phrase has two parts: a noun, and any modifiers connected to that noun. Most often, these modifiers will be adjectives, articles, and prepositional phrases. The modifiers may also be determiners. Noun phrases often function as verb subjects and objects, as predicative expressions, and as the complements of prepositions. A noun group can also contain one or more modifiers. A modifier is an adjective, an adjectival phrase , a secondary noun, a prepositional phrase or a relative clause. Like all phrases, the constituents of the English noun phrase can be analyzed into both functional constituents and formal constituents. From a functional point of view, the noun phrase has four major components, occurring in a fixed order:
Three types of modification are distinguished here:
a) Premodification that comprises all the units placed before the head:
two smart hard-working students.
b) Post modification that comprises all the units all the units placed after the head: *students from Boston.*
c) Mixed modification that comprises all the units in both pre-head and post-head position: two smart hard-working students from Boston.
the *determinative*, that constituent which determines the reference of the noun phrase in its linguistic or situational context.

In noun-phrases with pre-posed modifiers we generally find adjectives, pronouns, numerals, participles, gerunds, nouns, nouns in the genitive case .According to their position all pre-posed adjuncts may be divided into pre-adjectivals and adjectivals. The position of adjectivals is usually right before the noun-head. Pre-adjectivals occupy the position before adjectivals. They fall into two groups: a) limiters (to this group belong mostly particles): just, only, even, etc. and b) determiners (articles, possessive pronouns, quantifiers - the first, the last).

Premodification of nouns by nouns (N+N) is one of the most striking features about the grammatical organization of English. It is one of devices to make our speech both laconic and expressive at the same time. Noun-adjunct groups result from different kinds of transformational shifts. NPs with pre-posed adjuncts can signal a striking variety of meanings:
world peace - peace all over the world
silver box - a box made of silver
table lamp -lamp for tables
table legs - the legs of the table
river sand - sand from the river
school child - a child who goes to school
The grammatical relations observed in NPs with pre-posed adjuncts may convey the following meanings:
1) subject-predicate relations: weather change;
2) object relations: health service, women hater;
3) adverbial relations: a) of time: morning star,
b) place: world peace, country house,
c) comparison: button eyes,
d) purpose: tooth brush.

It is important to remember that the noun-adjunct is usually marked by a stronger stress than the head.[1] special interest is a kind of 'grammatical idiom'where the modifier is reinterpreted into the head: a devil of a man, an angel of a girl.
NPs with post-posed may be classified according to the way of connection into preposition less and prepositional. The basic prepositionless NPs with post-posed adjuncts are: N adj. - tea strong, NVen - the shape unknown, NVing - the girl smiling, ND - the man downstairs, NVinf - a book to read, NNum - room ten.
The pattern of basic prepositional NPs is NI prep. N2. The most common preposition here is 'of - a cup of tea, a man of courage. It may have quite different meanings: qualitative - a woman of sense, predicative - the pleasure of the company, objective - the reading of the newspaper, partitive - the roof of the house.
Several forms classes can be "reused." For example, in the noun phrase it is possible to use quantifiers to function as pre-determiners or as post-determiners. This kind of "recycling" is known as *recursion*. Notice also that phrases and even whole clauses can be "recycled" into the noun phrase. This process of placing a phrase of clause within another phrase of clause is called *embedding*. It is through the processes of recursion and embedding that we are able to take a finite number of forms (words and phrases) and construct an infinite number of expressions. Furthermore, embedding also allows us to construct an infinitely long structure, in theory anyway. For example, the nursery rhyme "The House That Jack Built" plays on the process of embedding in English noun phrases. The nursery rhyme is one sentence that continuously grows by embedding more and more relative clauses as post modifiers in the noun phrase that ends the sentence.

This is the house that Jack built

This is the bread that lay in the house that Jack built
This is the rat that ate the bread
that lay in the house that Jack built
This is the cat that killed the rat
that ate the bread that lay in the house that Jack built

Finally, we can say that noun phrases have its own usage in English grammar and considered to be inseparable part of communication in our daily speech.

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Modern Methods Of Language Instruction

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Abstract.
Innovative approaches to language teaching have revolutionized how educators facilitate language acquisition, integrating modern technology, collaborative learning, and learner-centered methodologies. This article explores cutting-edge teaching methods such as task-based language teaching (TBLT), flipped classrooms, communicative language teaching (CLT), and the use of digital tools in language instruction. By combining traditional linguistic frameworks with modern pedagogical innovations, teachers can address diverse learning needs, enhance engagement, and achieve better outcomes. These approaches foster active participation, encourage real-world application, and prepare learners for communicative competence in global contexts.
Keywords: Language teaching, task-based learning, flipped classroom, communicative language teaching, digital tools, learner-centered methods, language acquisition.

Introduction.
Language teaching has undergone a transformative shift over the past few decades, moving beyond traditional rote memorization and grammar-focused instruction to more dynamic, interactive, and learner-centered approaches. With globalization and technological advancements, language learning today is not just about mastering grammar rules or vocabulary but about developing communicative competence— the ability to use language effectively in real-life contexts. This evolution has prompted educators and researchers to explore innovative teaching methodologies that make the learning process more engaging, effective, and aligned with the needs of 21st-century learners.
Traditionally, methods such as the Grammar-Translation Method and the Audio-Lingual Method were widely used in language classrooms. These approaches, while systematic and structured, often emphasized memorization of rules, mechanical drills, and translation tasks, which lacked real-world applicability. Students were passive recipients of information, and their learning experience was largely teacher-centered. Although such methods provided a foundation for grammatical accuracy, they failed to address fluency, communicative skills, and the dynamic nature of language in use.

Task-Based Language Teaching (TBLT).
Task-based language teaching is an innovative, student-centered approach that emphasizes using language for meaningful tasks rather than focusing on isolated grammar exercises.

- **Principles of TBLT**: Learners engage in activities that simulate real-life tasks, such as planning a trip, writing emails, or conducting interviews. These tasks create an authentic context for language use and encourage learners to focus on meaning rather than form.
- **Example**: In a lesson on "directions," learners may work in groups to create a map of their city and provide directions to different landmarks.

TBLT encourages interaction, negotiation of meaning, and critical thinking, promoting both fluency and accuracy. Research shows that students retain language skills better when they actively use them in context, as opposed to merely memorizing vocabulary or grammar rules.

Flipped Classroom Approach.
The flipped classroom is a blended learning model that reverses the traditional teaching sequence. In this approach, students study course materials, such as videos or reading

assignments, at home before class. Class time is then used for interactive activities, discussions, and problem-solving.

- **Advantages**:
  - Learners access content at their own pace.
  - Teachers can dedicate class time to language practice and personalized feedback.
  - It fosters active learning and increases student engagement.
- **Example**: Students watch a video explaining verb tenses before class. During the lesson, they apply this knowledge in group activities, role-plays, or collaborative writing tasks.

This approach leverages technology to create a flexible and interactive learning environment where students become active participants in their education.

Communicative Language Teaching (CLT).

Communicative language teaching focuses on developing learners' ability to communicate effectively in the target language. It prioritizes real-life communication over memorization of grammar rules.

- **Key Features**:
  - Emphasis on speaking, listening, and interaction.
  - Use of authentic materials (e.g., news articles, podcasts, real-life conversations).
  - Activities such as role-plays, debates, and information-gap tasks.
- **Example**: In a lesson about food and restaurants, learners engage in role-plays where one student acts as a waiter and another as a customer. This activity requires learners to use relevant vocabulary and expressions in a realistic context.

CLT aligns with the idea that language is a means of communication, making it highly effective for learners who need practical language skills for travel, work, or everyday interactions.

The Role of Digital Tools and Technology.

Modern technology has opened new avenues for innovative language teaching. Digital tools such as language learning apps, virtual classrooms, and online collaboration platforms play a significant role in enhancing engagement and accessibility.

- **Online Learning Platforms**: Tools like Zoom, Google Classroom, and Microsoft Teams allow teachers to conduct interactive lessons, especially in online or blended learning environments.
- **Language Apps**: Applications like Duolingo, Quizlet, and Memrise enable self-paced vocabulary learning and practice.
- **Gamification**: Incorporating games and quizzes into lessons motivates learners and makes language learning enjoyable. For example, tools like Kahoot! can be used for interactive vocabulary tests.
- **Virtual Reality (VR)**: VR technology allows learners to immerse themselves in simulated real-life environments, enhancing speaking and listening skills.

The integration of technology not only makes learning accessible but also caters to diverse learning styles, improving motivation and retention.

Here's a clear and concise table summarizing **The Role of Digital Tools and Technology** in language teaching:

Digital Tool/Technology	Role in Language Teaching	Examples
Learning Management Systems (LMS)	Organize course content, assignments, and track student progress.	Moodle, Blackboard, Google Classroom
Language Learning Apps	Provide interactive, gamified language learning for vocabulary, grammar, and speaking skills.	Duolingo, Babbel, Rosetta Stone, Memrise
Video Conferencing Tools	Enable real-time communication and virtual classrooms, fostering interaction and feedback.	Zoom, Microsoft Teams, Google Meet

Multimedia Tools	Support listening, speaking, and comprehension skills through audiovisual content.	YouTube, TED Talks, podcasts
Virtual and Augmented Reality (VR/AR)	Create immersive environments for contextual language practice and cultural learning.	Mondly VR, VRChat, Google Expeditions
Digital Assessment Tools	Facilitate online testing, quizzes, and automated feedback for skill evaluation.	Kahoot!, Quizlet, Google Forms, Socrative
Online Collaborative Tools	Encourage group projects, peer learning, and collaborative tasks.	Padlet, Trello, Google Docs, Slack
AI-Powered Tools	Offer personalized feedback, speech recognition, and adaptive learning pathways.	ChatGPT, Grammarly, Google Translate, Speech-to-Text tools
Gamification Platforms	Engage learners through rewards, challenges, and interactive games.	Kahoot!, Quizizz, Minecraft Education Edition
Social Media Platforms	Foster communication, cultural exchange, and informal language practice.	Facebook Groups, Instagram, Twitter, language forums
Digital Dictionaries and Tools	Assist in vocabulary building, pronunciation, and translation.	WordReference, Oxford Online Dictionary, Forvo, Google Translate

Collaborative and Learner-Centered Methods.

Innovative teaching methods emphasize collaboration and learner autonomy, recognizing that active participation leads to deeper learning.

- **Project-Based Learning**: Students work on projects that require language use for research, planning, and presentation. For instance, learners may create a travel brochure for a target-language country.
- **Peer Teaching**: Students teach each other concepts, which enhances understanding and reinforces learning.

By placing learners at the center of the learning process, these approaches develop critical skills like teamwork, creativity, and problem-solving, while building confidence in language use.

Conclusion.

Innovative approaches to language teaching—such as task-based learning, flipped classrooms, communicative methods, and the integration of technology—have transformed traditional classrooms into dynamic, interactive environments. These methods prioritize communication, active participation, and real-world application, making language learning more engaging and effective.

By embracing these innovations, educators can better address the diverse needs of learners, equip them with practical language skills, and foster a lifelong interest in language acquisition. As technology and pedagogy continue to evolve, the future of language teaching will undoubtedly be characterized by even greater creativity, flexibility, and learner-centered practices.

The evolving landscape of language teaching has underscored the importance of adopting innovative approaches that align with the needs of 21st-century learners. Traditional methods, while foundational, often fell short in promoting communicative competence, learner engagement, and real-world application. Innovative methodologies such as Task-Based Language Teaching (TBLT), Communicative Language Teaching (CLT), and the Flipped Classroom have demonstrated their effectiveness in fostering both linguistic accuracy and fluency through active learning, meaningful interaction, and student-centered instruction.

The integration of technology has further revolutionized language teaching by providing interactive, flexible, and personalized learning experiences. Tools such as online platforms,

mobile apps, virtual classrooms, and gamification enhance accessibility and engagement, enabling learners to practice language skills beyond the traditional classroom setting. Moreover, collaborative approaches like Project-Based Learning (PBL) encourage students to develop critical thinking, creativity, and teamwork while using language as a tool for communication and problem-solving.

By combining modern pedagogical strategies with technological advancements, educators can create dynamic learning environments that cater to diverse learning styles, motivations, and goals. These innovative approaches not only make language learning more effective but also empower learners to use language confidently and proficiently in real-world contexts.

In conclusion, the future of language teaching lies in adaptability, creativity, and the thoughtful integration of technology and learner-centered methods. Educators must continue to explore and implement approaches that make the learning process engaging, relevant, and meaningful. By doing so, they can prepare learners not only to master language skills but also to navigate a globalized world where communication is key to personal and professional success.

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The Contribution Of Small Businesses To Poverty Reduction

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Abstract.
This thesis explores the pivotal role of small businesses in reducing poverty, particularly in developing economies. Small enterprises contribute significantly to employment creation, income generation, and economic empowerment, especially among women and youth. Their localized operations strengthen communities and promote inclusive growth. Despite challenges such as limited access to finance and markets, small businesses remain vital to sustainable development and resilience against economic shocks. Policy support, entrepreneurship education, and digital integration are essential for maximizing their impact. This study emphasizes that fostering small business growth is a strategic pathway toward long-term poverty alleviation and economic equity.
Keywords: Small businesses, poverty reduction, employment, entrepreneurship, inclusive growth

Poverty remains one of the most pressing challenges facing humanity, especially in developing countries where millions struggle to secure basic needs. Over the past few decades, economists, policymakers, and development organizations have explored multiple strategies to alleviate poverty. One of the most effective and sustainable approaches has been promoting small business development. Small businesses, also referred to as small and medium enterprises (SMEs), play a vital role in economic growth, job creation, income generation, and community development. Their contribution to poverty reduction is multifaceted, affecting both the macroeconomic and microeconomic levels. Through employment creation, income distribution, local empowerment, and economic inclusivity, small businesses have proven to be a critical driver of socioeconomic progress.

To understand the connection between small businesses and poverty reduction, it is essential to first grasp the characteristics and functions of small enterprises. Small businesses are typically defined by their size, number of employees, and annual revenue. These firms operate in various sectors, including retail, manufacturing, services, agriculture, and construction. Despite their relatively limited scale, small businesses are highly adaptable and often more labor-intensive than large corporations. Their operations tend to be localized, providing goods and services directly to communities and thereby reinforcing the economic fabric of their regions. In many developing countries, small businesses form the backbone of the economy, often representing over 90% of all registered enterprises and contributing significantly to GDP.

One of the most direct ways small businesses contribute to poverty reduction is through job creation. Employment is the primary source of income for most individuals, and small businesses are often more effective at generating employment than larger corporations, particularly in underserved and rural areas. Unlike large enterprises that may rely heavily on automation or centralized operations, small businesses tend to employ a higher number of workers relative to their output. They offer opportunities to those who may not meet the formal employment criteria of larger firms, such as individuals without advanced education, those from marginalized communities, or people with limited work experience. By providing jobs, small businesses help individuals move from subsistence living to wage-earning positions, enabling them to support their families, access healthcare, and invest in education.

Moreover, small businesses foster income distribution, which is crucial in reducing economic inequality—a key driver of poverty. In many economies, wealth is concentrated in the hands of a few large corporations and affluent individuals, leading to skewed income patterns. Small businesses, on the other hand, enable a broader section of society to participate in economic

activities. Entrepreneurs, employees, and local suppliers benefit from the revenues generated by small enterprises. These businesses often source inputs from the local market, hire within the community, and reinvest profits in their immediate environment. This localized economic activity ensures that money circulates within poorer communities, enhancing the purchasing power of residents and improving their quality of life.

Another critical aspect of small businesses in poverty alleviation is their role in promoting entrepreneurship and self-reliance. Entrepreneurship empowers individuals by providing them with the means to control their economic destiny. In regions where formal employment opportunities are scarce or declining, starting a small business can be a viable path out of poverty. Microenterprises such as food stalls, tailoring shops, craft production, and transportation services require minimal startup capital and can be launched by virtually anyone with determination and basic skills. Governments and NGOs often support such ventures through microfinance, business training, and mentorship programs. These interventions help potential entrepreneurs overcome initial barriers, gain confidence, and establish sustainable livelihoods. Furthermore, successful small businesses often inspire others in the community to pursue similar paths, creating a ripple effect of economic empowerment.

Women and youth—two groups disproportionately affected by poverty—stand to gain significantly from small business development. Women in many parts of the world face cultural, educational, and legal obstacles to formal employment. However, small businesses offer a flexible and accessible platform for women to earn income, gain financial independence, and contribute to household decision-making. Female entrepreneurs often reinvest their earnings into their children's education, healthcare, and nutrition, breaking the intergenerational cycle of poverty. Similarly, youth who struggle to find formal jobs due to lack of experience or limited qualifications can start their own ventures or find employment in local SMEs. By integrating these groups into the economic mainstream, small businesses play a vital role in promoting social inclusion and equity.

In addition to their immediate economic benefits, small businesses contribute to the resilience and sustainability of local economies. Unlike large multinational corporations that may relocate or downsize operations in response to global market shifts, small businesses are generally rooted in their communities. Their success depends on local demand, community relationships, and regional supply chains. This local anchoring helps stabilize economies during economic downturns and reduces dependence on external forces. Furthermore, small businesses tend to be more environmentally conscious, often employing traditional methods, using fewer resources, and producing less waste compared to industrial giants. In an era where environmental degradation exacerbates poverty through resource depletion and climate shocks, the sustainable practices of small enterprises become even more valuable.

Despite their numerous benefits, small businesses face several challenges that can limit their effectiveness in reducing poverty. Access to finance remains a significant barrier, as many small business owners lack collateral or formal credit history. Banks often perceive them as high-risk borrowers and deny loans that could otherwise be used for expansion, hiring, or equipment upgrades. Additionally, small businesses may struggle with limited market access, regulatory burdens, lack of technological infrastructure, and insufficient managerial skills. Governments and development agencies must address these constraints through targeted policies, such as tax incentives, simplified registration processes, access to affordable credit, infrastructure support, and business development services. Public-private partnerships can also play a role in integrating small businesses into value chains, providing them with market access and technical know-how.

Education and skill development are also critical components of leveraging small businesses for poverty reduction. Many small business owners operate informally and lack basic business knowledge, such as accounting, marketing, and strategic planning. By investing in vocational training and entrepreneurship education, governments can enhance the productivity and

competitiveness of small enterprises. Moreover, digital tools and e-commerce platforms offer new opportunities for small businesses to reach wider markets, increase efficiency, and innovate. Initiatives that promote digital inclusion—especially in rural and remote areas—can dramatically improve the performance of small businesses and their ability to contribute to poverty alleviation.

The COVID-19 pandemic underscored both the vulnerability and importance of small businesses in economic systems. As lockdowns disrupted global supply chains and shuttered large corporations, many small businesses adapted swiftly to changing conditions by shifting to online sales, offering delivery services, or repurposing their production to meet emerging demands. This agility highlights the resilience of small businesses and their potential to act as a buffer against economic shocks. At the same time, the pandemic revealed the fragility of informal workers and small enterprises without social protection or access to emergency financing. Recovery strategies must therefore prioritize the inclusion and strengthening of small businesses to ensure equitable and sustainable economic revival.

Case studies from various countries further illustrate the transformative impact of small businesses on poverty reduction. In Bangladesh, the Grameen Bank microcredit model has helped millions of rural women start small businesses, resulting in increased incomes, reduced dependency, and improved community development. In Kenya, mobile money platforms like M-Pesa have enabled small entrepreneurs to manage finances, conduct transactions, and grow their businesses even without access to traditional banking services. In Latin America, programs like Brazil's SEBRAE offer technical support and mentorship to small businesses, leading to higher survival rates and improved employment outcomes. These examples underscore the potential of small businesses as engines of inclusive growth and social progress.

In conclusion, small businesses are a powerful force in the fight against poverty. They create jobs, distribute income, promote entrepreneurship, empower marginalized groups, and strengthen local economies. Their contribution is not limited to financial gains; small businesses also foster dignity, self-sufficiency, and hope among those living in poverty. While challenges persist, strategic support from governments, international organizations, and the private sector can unlock the full potential of small businesses as catalysts for sustainable development. By nurturing the growth and resilience of small enterprises, societies can build more inclusive, equitable, and prosperous futures for all.

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Up-To-Date Methods For Teaching Foreign Languages

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Abstract.
The teaching of foreign languages has evolved significantly over the years, with modern methodologies reflecting changes in both educational technology and language acquisition theories. This article examines the latest methods of teaching foreign languages, including communicative language teaching (CLT), task-based language teaching (TBLT), content and language integrated learning (CLIL), and technology-enhanced learning. It emphasizes the importance of interaction, real-world communication, and the integration of language learning with content. By focusing on these modern methods, the article highlights their effectiveness in fostering a deeper understanding and proficiency in foreign languages, particularly in diverse and multilingual classroom settings.
Keywords: language acquisition, communicative language teaching, task-based language teaching, content and language integrated learning, technology-enhanced learning, foreign language teaching.

Introduction

Foreign language teaching has always been central to education systems worldwide, as proficiency in additional languages plays a crucial role in communication, career development, and cultural exchange. In recent years, the traditional methods of language instruction, which often emphasize grammar rules and rote memorization, have been challenged by more interactive and communicative approaches. Modern foreign language teaching focuses on equipping learners with the skills necessary for real-world communication, integrating content, and incorporating technology to enhance learning experiences. The methodologies explored in this article—Communicative Language Teaching (CLT), Task-Based Language Teaching (TBLT), Content and Language Integrated Learning (CLIL), and technology-enhanced learning—are reflective of contemporary shifts towards more learner-centered and context-driven language education.

The transition from older, grammar-translation methods to these modern approaches stems from the growing recognition that language learning is not only about acquiring vocabulary and grammar but also about developing the ability to use the language in diverse, authentic situations. This article aims to explore the key features and benefits of these modern methods, highlighting their impact on language learners and teachers.

Main Body

Communicative Language Teaching (CLT)

Communicative Language Teaching (CLT) emerged in the 1970s and remains one of the most influential modern language teaching methods. Unlike traditional methods that focus on isolated language skills, CLT emphasizes communication and interaction as the core of language learning. The central tenet of CLT is that the primary purpose of language is communication, and therefore, language learners should engage in activities that mirror real-life communication.

In practice, CLT includes activities such as role plays, simulations, debates, and discussions. The goal is to help students gain fluency, improve their ability to think in the target language, and respond to real-world situations. Grammar and vocabulary are taught implicitly through

communication rather than through explicit instruction. This method promotes confidence in speaking and understanding the language, making it an effective tool for learners seeking to use the language in practical contexts.

Task-Based Language Teaching (TBLT)

Task-Based Language Teaching (TBLT) focuses on learning through completing meaningful tasks. This approach centers on the idea that language is best learned through interaction with real-world tasks that require students to use the target language to achieve specific outcomes. In a TBLT classroom, learners are presented with tasks such as planning a trip, solving a problem, or writing a report—tasks that necessitate the use of language in practical, everyday contexts.

TBLT offers several advantages: it emphasizes meaningful use of the language, encourages collaboration, and develops problem-solving skills. Language acquisition is facilitated through the completion of tasks, which motivates students and allows them to apply language knowledge in ways that are relevant to their personal and professional lives. Moreover, the focus on communicative tasks encourages students to be more independent and creative in their language learning.

Content and Language Integrated Learning (CLIL)

Content and Language Integrated Learning (CLIL) is a dual-focused approach that combines content learning with language acquisition. CLIL integrates the teaching of a subject, such as science, history, or mathematics, with the learning of a foreign language. This method allows students to acquire both content knowledge and language proficiency simultaneously, making learning more engaging and meaningful.

CLIL is especially beneficial for advanced learners who already have a basic understanding of the target language but wish to deepen their proficiency. By engaging with subject-specific content, learners are exposed to specialized vocabulary and complex language structures in context, enhancing both their content knowledge and language skills. This approach not only improves language fluency but also fosters cognitive development, as students need to process information in both the foreign language and the subject matter.

Technology-Enhanced Language Learning (TELL)

The integration of technology in language learning has revolutionized the field, offering new opportunities for students and teachers alike. Technology-enhanced language learning (TELL) incorporates digital tools and resources, such as language learning apps, online courses, virtual classrooms, and multimedia content, into the language learning process. These tools provide students with a wealth of resources for language practice outside the traditional classroom setting.

TELL offers several advantages: it supports individualized learning, provides instant feedback, and facilitates access to a wide range of authentic materials, such as podcasts, videos, and articles. Moreover, technology encourages students to take control of their learning, making language practice more flexible and accessible. Technologies like speech recognition software, interactive games, and virtual reality environments also provide innovative ways to immerse learners in real-world scenarios, enhancing their engagement and language proficiency.

Table 1: This table highlights the various tools and technologies that support language learning, making it more accessible, flexible, and engaging for learners.

Feature	Description	Examples
Learning Platforms	Online platforms that offer language courses, interactive exercises, and quizzes.	Duolingo, Babbel, Rosetta Stone, Memrise.

Multimedia Resources	Use of audio, video, and interactive materials to enhance language comprehension and engagement.	YouTube videos, podcasts, language learning apps with video content, online news articles in the target language.
Mobile Apps	Apps that allow learners to practice and engage with the language anytime, anywhere, often with gamification.	Duolingo, HelloTalk, Tandem, Anki.
Speech Recognition	Software that evaluates and provides feedback on pronunciation.	Google Translate (pronunciation feature), Elsa Speak, Rosetta Stone's speech recognition system.
Virtual Reality (VR)	Immersive environments where learners can practice language skills in real-world simulations.	Mondly VR, ENGAGE VR, Virtual Reality Language Learning Apps.
Artificial Intelligence (AI)	AI-driven tools that personalize learning paths, adapt to individual learner needs, and provide instant feedback.	Grammarly, AI-powered chatbots for conversational practice, adaptive learning platforms like Lingvist.
Online Language Communities	Platforms where learners can communicate with native speakers and fellow learners.	Tandem, HelloTalk, Conversation Exchange, Reddit language learning communities.
Interactive Games	Games designed to promote language learning through engaging activities.	Kahoot, Quizlet, FluentU, Babbel's game-based exercises.
Real-time Communication Tools	Tools that facilitate live interaction and communication with teachers or peers in real time.	Skype, Zoom, Google Meet for virtual language exchange or tutoring.
Virtual Classrooms	Online classrooms with live sessions, teacher-led activities, and group discussions.	Italki, Preply, Coursera language courses, online university language courses.

Conclusion

In conclusion, modern methods of teaching foreign languages have undergone significant transformations, driven largely by advancements in technology, a deeper understanding of linguistic theory, and evolving pedagogical approaches. Traditional methods of language instruction, while still valuable, are increasingly being complemented or replaced by innovative practices that emphasize learner-centered, interactive, and technology-enhanced experiences.

The shift towards communicative language teaching (CLT) and task-based language teaching (TBLT) has moved the focus away from rote memorization and grammar drills to real-world communication, emphasizing fluency, interaction, and practical language skills. This approach encourages learners to use the language in authentic contexts, fostering a deeper understanding of its use in daily life. Moreover, these methods stress the importance of motivation, learner autonomy, and the integration of culture into language learning, ensuring that students not only acquire linguistic competence but also gain a broad understanding of the societies where the language is spoken.

Technology-enhanced language learning (TELL) has revolutionized the language learning landscape by providing learners with instant access to resources, interactive tools, and opportunities for real-time practice. The use of multimedia resources, mobile apps, virtual reality (VR), artificial intelligence (AI), and online communities has made language learning more flexible, personalized, and engaging. These technological tools cater to diverse learning styles, enabling learners to study at their own pace and receive immediate feedback, which accelerates the learning process and enhances retention. Additionally, AI and machine learning algorithms have allowed for personalized learning experiences, adapting content and difficulty levels based on individual learner progress and preferences.

The integration of technology also fosters greater collaboration and communication among learners. Online platforms and virtual classrooms enable learners to interact with teachers and peers across the globe, breaking down geographical and time barriers. Real-time communication tools like video chats, language exchange platforms, and collaborative online

environments have created immersive spaces for language practice, where students can engage with native speakers, ask questions, and clarify doubts in authentic, interactive settings. These online language communities help students develop not only their linguistic skills but also their cultural awareness and understanding of different social contexts.

However, while modern methods of teaching foreign languages offer numerous advantages, it is essential for educators to strike a balance between traditional and contemporary approaches. The integration of technology should enhance, not replace, human interaction and guidance. Teachers remain crucial in motivating students, providing personalized feedback, and facilitating the learning process. The most effective language learning environments combine the best elements of both traditional and modern methods, incorporating communicative, task-based, and technology-driven approaches to create dynamic, engaging, and effective learning experiences.

Ultimately, the future of language learning will continue to be shaped by technological innovations, but the human element will always remain central to the process. The challenge for educators and learners alike will be to adapt to new tools and methodologies while maintaining a focus on meaningful communication, cultural exchange, and the development of critical thinking and problem-solving skills. With the continued evolution of teaching methods and the increasing integration of technology, learners will have access to a wealth of resources, making foreign language learning more accessible and enjoyable than ever before.

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Theoretical Models of the Impact of Small Business and Entrepreneurship on Poverty

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Abstract.
This thesis explores theoretical models that explain how small businesses and entrepreneurship contribute to poverty reduction. It analyzes the neoclassical, endogenous growth, Schumpeterian innovation, livelihood, and institutional theories, each highlighting different pathways to economic empowerment. The study shows that entrepreneurship generates employment, promotes innovation, builds resilience, and fosters inclusive growth, particularly in developing contexts. Special attention is given to gender dynamics, informal economies, and institutional support structures. The research emphasizes that poverty alleviation through entrepreneurship requires an enabling environment and context-specific interventions informed by a blend of these theoretical perspectives.
Keywords: Entrepreneurship, small business, poverty reduction, development theory, inclusive growth

The relationship between small businesses, entrepreneurship, and poverty reduction has garnered increasing attention in recent decades, particularly in the context of developing economies and the global effort to meet the United Nations Sustainable Development Goals. Small businesses and entrepreneurial activity are seen as engines of economic growth, capable of generating employment, enhancing incomes, and stimulating innovation. However, to fully understand their impact on poverty, it is essential to examine the theoretical frameworks that underpin this relationship. These models provide insight into the mechanisms through which entrepreneurial initiatives and small-scale enterprises contribute to economic and social transformation. While real-world applications often vary due to regional and contextual differences, several key theories help explain how entrepreneurship and small business development influence poverty dynamics. These include the neoclassical economic model, endogenous growth theory, the Schumpeterian innovation model, the livelihood approach, and the institutional theory of development.

The neoclassical economic model provides a foundational perspective on the role of small businesses and entrepreneurship in resource allocation and market efficiency. In this framework, markets are viewed as mechanisms for optimal allocation of resources, assuming perfect competition and rational decision-making. Entrepreneurs, as agents of economic activity, respond to price signals, seek profit maximization, and contribute to employment through the establishment of firms. According to neoclassical theory, reducing barriers to entry and allowing market forces to operate freely can enhance productivity and growth, thereby reducing poverty over time. Small businesses, by operating in various sectors, especially informal and underserved markets, increase employment opportunities for the poor and help absorb surplus labor that might otherwise remain unemployed. While this theory provides a broad justification for encouraging entrepreneurship as a strategy for poverty alleviation, it has limitations in addressing market imperfections, information asymmetries, and access to capital—barriers that disproportionately affect the poor.

The endogenous growth theory offers a more nuanced understanding of how entrepreneurship contributes to long-term economic development and poverty reduction. This model, developed by economists such as Paul Romer and Robert Lucas, emphasizes the role of knowledge, human capital, and innovation in driving economic growth. Unlike the neoclassical view, which treats technological progress as an exogenous factor, the endogenous model incorporates it as an internal component of the economy. Entrepreneurship, within this framework, is central

to innovation and knowledge dissemination. Small businesses are often more agile and responsive to local needs than large corporations, making them vital vehicles for introducing new products, services, and business models that can uplift underserved communities. For instance, microenterprises in rural areas might introduce affordable solar lighting solutions or mobile payment systems that drastically improve quality of life and economic participation for the poor. In this model, investing in education, skills development, and entrepreneurial training is seen as a long-term strategy for sustainable poverty reduction.

The Schumpeterian innovation model, named after economist Joseph Schumpeter, places the entrepreneur at the center of economic transformation. In this view, entrepreneurs are not merely profit seekers but are innovators who disrupt existing markets through "creative destruction." They introduce new technologies, methods of production, and organizational forms that replace outdated systems, drive competition, and foster progress. This dynamic process creates new industries and opportunities, which can have profound implications for poverty reduction. For example, the rise of digital platforms has enabled countless micro-entrepreneurs in developing countries to access global markets, sell handmade goods, or offer services like translation and tutoring. Schumpeterian theory highlights that true entrepreneurial impact lies not only in creating jobs but also in transforming economies to be more inclusive, efficient, and opportunity-rich. However, it also acknowledges that creative destruction can displace existing workers and businesses, thus requiring targeted policy support to ensure that the poor are not left behind in the process of innovation.

A more socially grounded framework is the sustainable livelihood approach, which looks beyond macroeconomic indicators to focus on the capabilities, assets, and activities required for a means of living. This model is particularly relevant in rural and informal economies, where small-scale entrepreneurship is often a survival strategy rather than a growth-driven enterprise. The livelihood approach considers five types of capital—human, social, physical, financial, and natural—that individuals draw upon to sustain their well-being. Small businesses and self-employment ventures are understood as adaptive responses to economic and environmental shocks. For instance, a farming family might diversify into poultry rearing or handicrafts to supplement seasonal income and ensure resilience. In this model, poverty is multidimensional, involving not just lack of income but also vulnerability, powerlessness, and exclusion. Entrepreneurship becomes a tool for empowerment when it enables individuals to build assets, reduce dependency, and exert control over their economic future. Unlike purely economic theories, the livelihood model integrates social and cultural factors, making it highly applicable in community-based development programs.

Another significant perspective comes from institutional theory, which emphasizes the role of formal and informal institutions—such as legal systems, property rights, financial regulations, and cultural norms—in shaping entrepreneurial activity and its impact on poverty. Institutions determine the rules of the game and influence who can participate in the economy and under what conditions. In contexts where property rights are unclear, corruption is rampant, or access to credit is restricted, entrepreneurship may be stifled, and small businesses may operate informally, limiting their growth potential and capacity to alleviate poverty. Conversely, strong institutions that support entrepreneurship—through microfinance, business training, legal reforms, and infrastructure development—can create enabling environments where small enterprises thrive and generate substantial social benefits. The institutional theory highlights the importance of policy design and governance in amplifying or constraining the poverty-reducing potential of entrepreneurship. It also underscores the need for tailored interventions that reflect the unique institutional realities of each society.

These theoretical models, while distinct in focus, collectively emphasize the multidimensional nature of entrepreneurship’s impact on poverty. At the individual level, entrepreneurship can empower the poor by offering them income-generating opportunities, fostering self-reliance, and providing a pathway out of unemployment. At the community level, small businesses can

stimulate local economies, increase demand for goods and services, and create a sense of shared prosperity. At the national level, a thriving small enterprise sector contributes to GDP growth, diversification, and resilience. However, translating theory into practice requires a careful understanding of context. For example, in regions with high illiteracy rates or limited infrastructure, the promotion of high-tech startups may be less effective than supporting traditional crafts or agribusiness ventures. Similarly, in post-conflict settings, entrepreneurship programs must address psychological trauma, trust deficits, and community rebuilding as part of their design.

The role of gender in entrepreneurship is also critical from a theoretical perspective. Feminist economic theories argue that empowering women through entrepreneurship can have disproportionately positive effects on poverty reduction. Women tend to reinvest more of their income into their families and communities, leading to better education, health, and nutrition outcomes. However, gender-based barriers such as lack of access to capital, discriminatory laws, and domestic responsibilities often hinder female entrepreneurs. Therefore, theoretical models must account for these gender dynamics and advocate for inclusive policies that address structural inequalities. Integrating gender-sensitive approaches into entrepreneurship development not only enhances fairness but also maximizes impact.

In conclusion, the theoretical models that examine the impact of small business and entrepreneurship on poverty offer a rich and diverse set of insights. From the resource allocation emphasis of neoclassical economics to the transformative potential of Schumpeterian innovation, and from the human-centric focus of the livelihood approach to the regulatory emphasis of institutional theory, each framework highlights different pathways through which entrepreneurial activity can drive poverty alleviation. The effectiveness of small businesses and entrepreneurship in reducing poverty ultimately depends on the interaction between these theoretical elements and the practical realities of economic, social, and institutional environments. Policymakers, development practitioners, and scholars must draw upon these models to design evidence-based, context-sensitive interventions that support small enterprise development as a means to achieve sustainable and inclusive economic growth. As global challenges such as climate change, pandemics, and digital disruption reshape the world economy, a robust theoretical understanding of entrepreneurship's role in poverty reduction remains more crucial than ever.

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Advanced Practices In Foreign Language Teaching

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Abstract.
Innovative methods in foreign language teaching have transformed traditional educational practices, offering dynamic and engaging approaches to language acquisition. This article explores modern methodologies such as communicative language teaching (CLT), task-based learning (TBL), content and language integrated learning (CLIL), flipped classrooms, gamification, and technology-enhanced language learning (TELL). These methods address learners' diverse needs, foster real-world language application, and incorporate digital tools to enhance engagement and proficiency. By analyzing these approaches, we highlight their effectiveness in creating student-centered, immersive learning environments that align with contemporary educational trends. The study underscores how innovative strategies can overcome common challenges in foreign language education and accelerate language learning outcomes.
Keywords: Foreign language teaching, innovative methods, communicative language teaching, gamification, flipped classroom, CLIL, technology-enhanced learning.

Introduction

In the globalized world of the 21st century, the ability to communicate in multiple languages has become increasingly essential for personal, academic, and professional development. Foreign language teaching has evolved over the years to accommodate the changing needs of learners and the advancements in technology. Traditional language teaching methods, such as the grammar-translation method and rote memorization, were once the standard but have increasingly been criticized for their lack of focus on communication and real-world application. As a result, innovative methods for foreign language teaching have emerged to address these shortcomings, offering more engaging, student-centered, and practical approaches to language learning.

Innovative methods in foreign language teaching focus on providing students with authentic language experiences, promoting interaction, and fostering skills that are directly applicable to real-life situations. Among the most significant advancements are communicative language teaching (CLT), task-based learning (TBL), content and language integrated learning (CLIL), flipped classrooms, gamification, and technology-enhanced language learning (TELL). These approaches prioritize active student involvement, collaboration, and the integration of modern tools to support learning.

Communicative language teaching (CLT) shifts the focus from the rote memorization of grammatical rules to using the language for meaningful communication. Task-based learning (TBL) encourages students to engage with language through authentic tasks that mirror real-life scenarios, helping them use the language in context. Content and language integrated learning (CLIL) combines subject knowledge with language acquisition, enhancing both content understanding and language proficiency. Additionally, the flipped classroom model allows students to learn content outside the classroom at their own pace, freeing up in-class time for deeper, more interactive learning. The incorporation of gamification further enhances motivation and engagement by making the learning process more enjoyable through game-like elements, while technology-enhanced learning (TELL) leverages digital tools and platforms to support flexible and interactive learning experiences.

These methods have transformed foreign language teaching into a dynamic, interactive process that fosters greater engagement and deeper language acquisition. By focusing on communication, collaboration, and real-world applications, innovative teaching approaches help students build practical language skills that go beyond simple grammar and vocabulary. The integration of technology and digital tools further enriches the learning experience, providing learners with immediate feedback, diverse resources, and opportunities for authentic language use.

As foreign language education continues to evolve, the adoption of innovative teaching methods plays a critical role in helping learners acquire languages more effectively and efficiently. This article explores the most prominent innovative methods in foreign language teaching, examining their theoretical foundations, practical applications, and impact on language learning outcomes. By analyzing these approaches, we aim to provide educators, researchers, and policymakers with insights into the future of foreign language teaching and how to design more engaging, effective, and learner-centered language education programs..

Main Body

Communicative Language Teaching (CLT)

Communicative language teaching emphasizes interaction as the primary means of learning a language. It shifts the focus from grammatical accuracy to meaningful communication, encouraging learners to use the target language in real-life situations.

- **Key Features**: Role-plays, pair work, group discussions, and situational dialogues.
- **Benefits**: Enhances fluency, builds confidence, and promotes spontaneous language use.
- **Example**: Students work in pairs to role-play a scenario such as ordering food at a restaurant or asking for directions.

Task-Based Learning (TBL)

Task-based learning involves learners completing meaningful tasks that require language use. Unlike traditional exercises, tasks focus on achieving specific outcomes, such as solving a problem or creating a project.

- **Key Features**: Real-world tasks, such as planning a trip, creating a presentation, or conducting interviews.
- **Benefits**: Develops critical thinking, problem-solving, and language skills simultaneously.
- **Example**: Learners create a travel itinerary for a foreign country and present it to the class in the target language.

TABLE 1: Content and Language Integrated Learning (CLIL)

Aspect	Description
Definition	CLIL is an approach where students learn a subject (e.g., science, history) through the medium of a foreign language, integrating content learning with language acquisition.
Key Features	- Dual-focused approach (learning both language and content) - Use of authentic materials related to the subject - Integration of language learning and cognitive skills
Subject Areas	Subjects commonly taught in CLIL include: - Science - Geography – History - Mathematics - Arts - Social Studies
Language Skills Developed	- Listening comprehension - Speaking (through discussions and presentations) - Reading and writing in the target language
Benefits	- Improves language proficiency in a meaningful context - Promotes deeper understanding of subject content

	- Fosters critical thinking and problem-solving skills
Target Learners	- Primary and secondary school students - University students studying in a second language - Adult learners in vocational settings
Challenges	- Requires well-trained teachers with expertise in both content and language - Potential overload for students balancing language and subject knowledge
Teaching Methods	- Active learning strategies (group work, peer discussions, debates) - Use of visual aids (charts, diagrams, videos) - Scaffolded language support (vocabulary lists)
Assessment	- Assessment of both language skills and subject knowledge - Use of rubrics that measure content mastery alongside language proficiency
Examples of CLIL Activities	- Conducting a science experiment and writing a report in the target language - Presenting a history topic using visual aids and language skills

This table provides a clear overview of the Content and Language Integrated Learning (CLIL) approach, its features, benefits, and some examples.

Flipped Classroom

The flipped classroom reverses traditional teaching by delivering instructional material outside the classroom (e.g., through videos or readings) and dedicating class time to active practice, discussions, and collaboration.

- **Key Features**: Pre-recorded lectures, in-class activities, and peer learning.
- **Benefits**: Maximizes classroom interaction, allows self-paced learning, and fosters deeper understanding.
- **Example**: Students watch a video explaining English verb tenses at home, and class time is used for group exercises applying those tenses in dialogues.

Gamification

Gamification applies game elements such as rewards, challenges, and competition to language learning. It increases motivation, engagement, and retention through interactive and enjoyable activities.

- **Key Features**: Language games, digital apps, points systems, and leaderboards.
- **Benefits**: Makes learning fun, reduces anxiety, and improves long-term retention.
- **Example**: Platforms like *Duolingo* and *Kahoot!* offer quizzes, challenges, and rewards for completing language lessons.

Technology-Enhanced Language Learning (TELL)

Technology plays a central role in modern language education, providing tools for interactive learning, online collaboration, and personalized practice.

- **Key Tools**: Virtual classrooms, language apps, artificial intelligence (AI), and augmented reality (AR).
- **Benefits**: Offers flexibility, access to authentic resources, and real-time feedback.
- **Example**: Students use AI-powered chatbots to practice conversational skills or engage in virtual exchanges with native speakers.

Conclusion

In conclusion, innovative methods for foreign language teaching represent a significant shift from traditional, teacher-centered approaches to more dynamic, student-centered learning environments. These methods prioritize communication, interaction, and real-world application, which are essential for effective language acquisition in today's globalized world.

By incorporating techniques like communicative language teaching (CLT), task-based learning (TBL), content and language integrated learning (CLIL), flipped classrooms, gamification, and technology-enhanced learning (TELL), educators can address the diverse needs of learners and promote deeper engagement with the language.

These modern methodologies encourage active participation, critical thinking, and practical use of the language, moving beyond rote memorization and grammar drills. They foster an environment where students are not only learning about the language but are also using it in meaningful contexts, thereby improving fluency, confidence, and real-life application. CLT, for instance, helps learners engage in authentic communication, while TBL focuses on achieving concrete outcomes through task completion. CLIL allows for integrated knowledge and language acquisition, and flipped classrooms optimize class time for collaborative learning. Gamification adds an element of fun, while TELL harnesses the power of technology to make learning more interactive and accessible.

The incorporation of technology plays a crucial role in these innovations, providing learners with tools for self-paced learning, personalized feedback, and exposure to authentic language resources. Virtual learning environments, AI-powered applications, and collaborative online platforms enable students to practice and improve language skills outside the classroom, extending learning beyond traditional boundaries. These methods also cater to different learning styles, ensuring that all students can benefit from tailored and flexible learning experiences.

Moreover, these approaches prepare students for real-world communication, making them more equipped to interact with native speakers and navigate cross-cultural situations. The emphasis on interactive, problem-solving tasks and meaningful use of language also aligns with the demands of the modern workforce, where language proficiency is often required in diverse professional and social contexts.

However, implementing these innovative methods requires thoughtful planning and adaptation by educators. The challenge lies in striking a balance between technology use and human interaction, ensuring that learners remain engaged and motivated while still receiving personalized instruction. Teacher training is also vital, as instructors must be well-versed in these new methodologies and adept at utilizing digital tools to enhance the learning process.

In the future, the role of innovative methods in foreign language teaching will only continue to grow, as advances in technology, global communication, and educational theory pave the way for even more dynamic and efficient language learning. As these approaches continue to evolve, it is essential for educators and institutions to remain flexible, adaptable, and committed to finding new ways to engage learners and foster a deeper understanding of foreign languages and cultures.

Ultimately, by embracing innovative teaching methods, we can create more engaging, inclusive, and effective language learning environments that empower students to become proficient, confident speakers, ready to participate in an interconnected world.

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The Pragmatic And Ideological Implications Of Euphemisms In Political Campaign Language

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Abstract
Euphemisms are a strategic component of political language, particularly during election campaigns where image, perception, and persuasion are paramount. This paper examines how euphemistic expressions are pragmatically used to perform speech acts that conceal ideological positions, manipulate voter perceptions, and frame political agendas in a more favorable light. Drawing on speech act theory, pragmatics, and critical discourse analysis, the study explores how euphemisms are employed not just to soften offensive or controversial messages, but to strategically obscure political realities. Through analysis of campaign speeches, slogans, and media messaging, the paper reveals the ideological mechanisms at work behind seemingly innocuous language and discusses its implications for democratic engagement and informed voting.

Introduction

Political campaigns are high-stakes performances where language plays a decisive role in shaping public perception. In these contexts, euphemisms are frequently used to mitigate negative connotations, obscure ideological commitments, and maintain voter appeal. While commonly viewed as tools of politeness or diplomacy, euphemisms in political campaigns perform far more complex pragmatic and ideological functions. They do not merely avoid offense; they shape how voters interpret and emotionally respond to political realities. This article explores the pragmatic use of euphemisms in election campaign discourse and how they reflect and perpetuate underlying ideological frameworks. Drawing on speech act theory, we investigate how euphemisms function as illocutionary acts—persuading, reassuring, or distracting the audience. At the same time, a critical discourse analysis uncovers how such language choices are far from neutral; they align with specific political ideologies and contribute to the strategic framing of issues. Finally, the study considers how media dissemination and voter response are influenced by euphemistically framed language.

Main Part

1. Speech Act Theory and the Pragmatics of Euphemism

Speech act theory, developed by Austin (1962) and extended by Searle (1969), provides a useful framework for understanding the pragmatic function of euphemisms. According to this theory, language does not merely describe reality—it performs actions. In political campaign language, euphemisms often serve illocutionary purposes such as:

- Reassurance: Using terms like “revenue enhancement” instead of “tax increases” to calm voter anxiety.
- Justification: Referring to cuts in social spending as “entitlement reform” to suggest fairness and efficiency.
- Legitimation: Talking about “nation building” instead of military occupation to frame foreign policy positively.

These speech acts are designed to elicit particular perlocutionary effects, including trust, support, or complacency. For example, when a candidate says, “We need to tighten our belts,” the phrase euphemistically refers to austerity or budget cuts. The metaphor activates a moral frame of personal responsibility and shared sacrifice, encouraging voters to accept reductions

in public spending as necessary or virtuous. Thus, euphemisms are not just a matter of style; they are strategic linguistic choices with performative power.

2. Euphemisms and Political Ideology

Language in political campaigns is rarely ideologically neutral. Euphemisms reflect and reinforce the speaker's worldview, often concealing radical policies behind moderate language. According to Fairclough (2003), euphemisms in political discourse work as "ideological filters," selecting which parts of reality are emphasized and which are obscured. Consider these common campaign euphemisms:

- "Family values" may appear neutral but often signals conservative views on gender roles and LGBTQ+ rights.
- "Job creators" reframes the wealthy or large corporations in a positive light, aligning with neoliberal economic ideology.
- "Illegal aliens" versus "undocumented workers" reflects opposing ideological stances on immigration.

Such language choices are central to discursive manipulation, where candidates seek to present their views as common-sense or moral, while delegitimizing opposition without engaging in open debate. For example, describing environmental regulations as "red tape" frames them as unnecessary burdens rather than protections, aligning with a pro-business, anti-regulation ideology.

The ambiguity created by euphemisms is especially useful during elections, as candidates aim to appeal to a broad audience without alienating specific voter blocs.

3. Media Framing and Voter Response

Once euphemistic campaign language is disseminated through media outlets, it contributes to the framing of political issues. According to Entman (1993), framing involves selecting certain aspects of reality and making them more salient. Euphemisms are a core part of this process. For example:

- News coverage that adopts the term "school choice" (instead of "school privatization") influences how the policy is perceived.
- When media use phrases like "tough on crime" rather than "increased incarceration," they reinforce a punitive justice frame.

Media often reproduces political euphemisms without critique, especially when covering speeches or campaign ads, further embedding these ideologically loaded terms into public consciousness.

Voter response is shaped by these frames. Research shows that euphemistic language can diminish emotional resistance, increase issue acceptability, and reduce policy awareness (Luntz, 2007). For instance, voters may support "entitlement reform" without realizing it entails significant cuts to social security or healthcare benefits. Euphemisms thus serve as tools of consent manufacture, where the electorate is led to support policies without fully understanding their implications.

4. Case Studies of Campaign Euphemism Use

Several real-world examples highlight the ideological and pragmatic utility of euphemisms: - U.S. Presidential Elections: Terms like "repeal and replace" (for Obamacare) or "alternative facts" (used by Trump's administration) subtly redirect focus from the loss of healthcare access or misinformation toward a positive, controlled narrative. - UK Brexit Campaign: Slogans such as "Take back control" functioned euphemistically to gloss over complex economic and social consequences, instead evoking sovereignty and empowerment.

- Russian Election Rhetoric: Phrases like "foreign agents" and "national unity" frame dissenting voices and minorities as threats, reinforcing nationalist ideology under the guise of patriotic solidarity.

These examples illustrate that euphemisms are not isolated word choices but part of broader ideological storytelling.

Conclusion

Euphemisms in political campaign language are far more than rhetorical flourishes. They are powerful pragmatic tools that perform key speech acts—reassuring, justifying, legitimizing—while simultaneously advancing specific ideological agendas. By employing vague, softened, or metaphorical language, political actors frame contentious issues in ways that obscure meaning, reduce opposition, and manufacture consent. This paper has argued that euphemisms in campaign discourse must be analyzed not only for what they hide, but also for what they reveal about the values, ideologies, and strategies of political actors. As media and voters absorb and reproduce these euphemistic frames, the space for informed and critical democratic engagement is diminished. Ultimately, raising awareness of the pragmatic and ideological functions of euphemisms is essential for empowering voters to question the language of politics and demand greater clarity and accountability from their leaders.

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Successful Techniques For Foreign Language Teaching In The 21st Century

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Abstract
The process of teaching foreign languages has evolved significantly in the modern educational environment, driven by advancements in pedagogy, technology, and global communication needs. This article explores effective methods for teaching foreign languages, emphasizing communicative approaches, task-based learning, the integration of technology, and personalized learning techniques. Modern methods, such as blended learning and virtual classrooms, combine traditional instruction with digital tools to enhance accessibility and engagement. Moreover, the focus on cultural immersion and authentic material improves language proficiency and intercultural competence. These strategies provide educators with a comprehensive framework to develop learners' communicative and practical skills.
Keywords: Foreign language teaching, communicative approach, task-based learning, technology integration, blended learning, virtual classrooms, cultural immersion, modern education.

Introduction

In an increasingly interconnected and globalized world, the ability to communicate in multiple languages has become a crucial skill. The demand for effective foreign language instruction has grown rapidly, driven by international collaboration, economic globalization, and cultural exchange. This shift in educational priorities has necessitated the development of innovative and practical methods for teaching foreign languages. Traditional approaches, such as grammar-translation methods and rote memorization, while once dominant, have proven insufficient in meeting the communicative needs of modern learners. Consequently, language education today focuses not only on linguistic accuracy but also on developing communicative competence, cultural understanding, and the ability to use language effectively in real-world contexts.

The modern educational environment, characterized by technological advancements, evolving pedagogy, and diverse learner needs, provides educators with new tools and opportunities to enhance language instruction. Methods such as Communicative Language Teaching (CLT), Task-Based Language Learning (TBLL), and blended learning have gained prominence for their ability to engage learners actively while fostering meaningful communication. The integration of technology, including virtual classrooms, mobile applications, and digital resources, has further revolutionized language learning, making it more accessible, interactive, and flexible.

Furthermore, cultural immersion has emerged as a key component of language education, as it allows learners to understand the cultural nuances that underpin effective communication. The use of **authentic materials**—such as literature, media, and real-world documents—bridges the gap between theoretical learning and practical application, helping learners acquire language in its natural, context-rich form. These methods address the challenges of teaching diverse groups of students, including learners of different ages, abilities, and motivations, by adopting a more learner-centered and adaptable approach.

The goal of this article is to explore the most effective methods for teaching foreign languages in the modern educational environment. By examining approaches such as communicative

teaching, task-based learning, technology integration, and cultural immersion, this study highlights strategies that not only build linguistic proficiency but also prepare learners for authentic communication in multicultural settings. Understanding and implementing these methods enable educators to create dynamic and engaging classrooms that respond to the evolving demands of language learning in the 21st century.

Main Body

Communicative Language Teaching (CLT)

The communicative approach prioritizes meaningful communication over mechanical drills. The primary goal is to develop learners' ability to use the language in real-life situations. Activities such as role-playing, discussions, interviews, and simulations encourage active participation and the practical use of language.

- **Key Principle:** Focus on fluency and accuracy in balanced proportions.
- **Example Activities:** Group discussions, storytelling, and interactive games.
- **Advantages:** Increases confidence and communicative competence.

Table 1: This table provides a clear, structured overview of Communicative Language Teaching, emphasizing its goals, methods, and potential challenges.

Aspect	Description
Definition	A teaching approach that emphasizes interaction and communication as the primary goal of language learning.
Key Principles	- Focus on communication rather than grammatical perfection. - Use of authentic materials and real-life contexts. - Emphasis on fluency and meaningful language use. - Student-centered learning. - Integration of all four language skills (listening, speaking, reading, writing).
Techniques	- Role-plays and simulations- Group and pair work - Information gap activities- Discussions and debates - Task-based activities (e.g., solving problems, projects).
Role of the Teacher	- Facilitator and guide rather than a sole authority. - Provides opportunities for real communication. - Gives constructive feedback without excessive focus on errors.
Role of the Learner	- Active participant in communication. - Takes responsibility for their own learning. - Collaborates with peers to complete tasks.
Materials Used	- Authentic materials like newspapers, videos, advertisements, and real-life documents. - Dialogue scripts, task cards, and role-play scenarios.
Advantages	- Improves communicative competence. - Encourages learner engagement and interaction. - Focuses on real-world application of language. - Develops fluency alongside accuracy.
Challenges	- May lack focus on formal grammar and accuracy. - Difficult to assess communicative skills objectively. - Requires trained teachers to facilitate effectively. - Can be challenging for large or mixed-ability classes.
Examples of Activities	- Role-play a job interview. - Conduct a group survey and present findings. - Solve a puzzle through group communication. - Plan a trip or event collaboratively.

Task-Based Language Learning (TBLL)

Task-Based Learning emphasizes the completion of meaningful tasks that require language use. Learners acquire new linguistic structures naturally while engaging in tasks such as problem-solving, project work, or real-life simulations.

- **Key Principle:** Language is learned through interaction and task completion rather than explicit grammar instruction.
- **Example Tasks:** Planning a trip, writing emails, or conducting interviews.
- **Advantages:** Develops problem-solving skills and promotes language use in authentic contexts.

Integration of Technology in Language Teaching

Modern educational environments leverage technology to enhance language instruction through tools such as Learning Management Systems (LMS), mobile applications, and virtual classrooms. Tools like Duolingo, Google Classroom, and Zoom have transformed language learning into an interactive and accessible experience.

- **Key Tools and Methods:**
  - **Online Platforms:** Video conferencing tools facilitate real-time interaction.
  - **Mobile Applications:** Gamified language apps boost vocabulary and grammar retention.
  - **Multimedia Content:** Podcasts, videos, and interactive websites expose learners to authentic language use.
- **Advantages:** Supports independent learning, flexibility, and global collaboration.

Blended Learning and Flipped Classrooms

Blended learning combines face-to-face instruction with online resources, offering learners flexibility while maintaining structured guidance from educators. In a flipped classroom, students engage with instructional material at home and practice language skills during in-class activities.

Key Features:

- Pre-class activities (videos, readings) prepare students for interactive classroom tasks.
- In-class time focuses on collaboration, communication, and problem-solving.

Advantages: Allows self-paced learning and maximizes classroom interaction.

Cultural Immersion and Authentic Materials

Language and culture are intertwined, making cultural exposure a vital component of foreign language teaching. Incorporating authentic materials, such as literature, news articles, films, and music, provides learners with a deeper understanding of cultural context and idiomatic expressions.

Key Practices:

- Using real-world materials for reading, listening, and discussions.
- Encouraging participation in virtual exchange programs or cultural projects.

Advantages: Enhances motivation and cultural competence, enabling learners to communicate more effectively in diverse settings.

Conclusion

The modern educational environment presents an array of opportunities and challenges for teaching foreign languages, necessitating innovative and effective approaches to language instruction. Traditional methods, which heavily relied on rote memorization and grammar-translation techniques, have gradually given way to dynamic strategies that prioritize communication, learner engagement, and practical application of language skills. Among the most effective methods are the communicative language teaching (CLT) approach, task-based language learning (TBLL), and blended learning models, all of which emphasize active participation, meaningful interaction, and the integration of real-world tasks into the learning process.

Technology has played a transformative role in modern language education, providing tools and platforms that make learning more accessible, interactive, and engaging. Virtual classrooms, language learning apps, multimedia resources, and online collaboration platforms have opened up new possibilities for students to practice language skills in authentic and diverse contexts. These digital tools not only enhance language acquisition but also foster

independent learning and global connectivity, preparing learners to navigate an increasingly interconnected world.

Moreover, the incorporation of cultural immersion and authentic materials, such as films, literature, news media, and interactive exchanges, is essential for developing cultural competence alongside linguistic proficiency. Understanding the cultural nuances of a foreign language enriches the learning process, enabling learners to communicate effectively and meaningfully in real-life situations. By combining language skills with cultural awareness, educators can help students become not only proficient speakers but also culturally sensitive global citizens.

The success of foreign language teaching in the modern educational environment ultimately hinges on the ability to adapt to learners' individual needs and preferences. Personalized learning strategies, combined with task-based activities and technology integration, create a learner-centered approach that motivates students and promotes long-term retention. This shift from teacher-centered to learner-centered instruction ensures that language education remains relevant, engaging, and effective.

In conclusion, effective methods of teaching foreign languages in the modern educational environment rely on a balanced integration of communicative approaches, task-based learning, technological innovations, and cultural immersion. By adopting these strategies, educators can create dynamic, interactive, and meaningful learning experiences that empower students to achieve fluency and confidence in their target language. As global communication continues to grow in importance, the adoption of these methods will not only enhance language education but also foster intercultural understanding and collaboration in an increasingly interconnected world.

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Rhetorical Functions Of Euphemisms In Crisis Communication By Political Leaders

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Abstract
This paper explores the strategic use of euphemisms in political leaders' crisis communication through the lens of Aristotelian rhetoric. Euphemisms, often dismissed as mere politeness, serve powerful rhetorical functions in shaping public perception during times of national or international crises such as pandemics, wars, or economic downturns. By employing ethos, pathos, and logos, euphemisms are utilized to reduce public panic, deflect responsibility, and reinforce authority. The study draws from rhetorical and crisis communication theories and offers a comparative analysis of political leaders' speeches during various crises, including COVID-19, military interventions, and economic collapses. The findings suggest that euphemistic language plays a central role in constructing politically favorable narratives, often at the expense of transparency. Understanding these rhetorical choices is essential for promoting critical public engagement and ethical communication in governance.

Introduction

In times of crisis, the words political leaders choose carry enormous weight. Their language must inspire confidence, provide clarity, and prevent widespread panic. However, clarity is not always the priority. Instead, euphemisms—mild or indirect expressions substituted for harsh or unsettling realities—are often employed to soften the impact of difficult truths. Far from being mere linguistic decorations, euphemisms serve vital rhetorical functions, particularly during crises where public trust and perception are at stake.

Drawing upon Aristotelian rhetorical appeals—ethos (credibility), pathos (emotional appeal), and logos (logical reasoning)—this paper analyzes how euphemisms are used in political speeches to manage crises. In this context, euphemisms can reduce public anxiety, shield leaders from blame, and reframe negative realities into manageable or even virtuous challenges. Using a comparative approach, this study examines how leaders across different political systems use euphemistic language during critical events such as the COVID-19 pandemic, military conflicts, and economic meltdowns.

Main Part

1. Euphemism as Rhetorical Strategy: An Aristotelian Perspective

Aristotle's three modes of persuasion—ethos, pathos, and logos—remain foundational in rhetorical theory. Political leaders in crisis often combine these appeals through euphemistic language to achieve specific outcomes.

- Ethos (Credibility): Leaders project trustworthiness by speaking calmly and rationally. Euphemisms like "temporary inconvenience" for lockdowns or "operational pause" for military retreats maintain a composed tone, reinforcing the speaker's control over the situation.
- Pathos (Emotional Appeal): Euphemisms often tap into collective emotions. During the COVID-19 pandemic, terms like "social distancing" (instead of "forced isolation") invoked communal responsibility rather than fear, framing compliance as a moral duty.
- Logos (Logical Reasoning): Euphemistic language can appear objective or technical. For example, "quantitative easing" during economic crises sounds analytical, disguising what is essentially large-scale money printing.

2. Euphemisms in Health Crises: The COVID-19 Pandemic

The global COVID-19 pandemic offers a rich case study of euphemistic rhetoric. Governments worldwide struggled to balance transparency with the need to avoid public panic. Leaders employed a wide range of euphemisms:
- “Shelter in place” instead of “lockdown” in the U.S., suggesting protection rather than restriction.
- “Circuit breaker” in Singapore, framing restrictions as temporary and technical, much like an electrical reset.
- “Flattening the curve” provided a visual metaphor to suggest manageable progress, downplaying death rates.
These terms were not neutral. They shaped the public’s emotional response (pathos), reinforced trust in institutional authority (ethos), and gave the impression of scientific rationality (logos).

3. War and Conflict: Sanitizing Violence Through Euphemism

Military and geopolitical conflicts are frequently narrated using euphemisms to preserve national morale and justify action.
- “Surgical strikes” implies precision and cleanliness, reducing the mental image of bloodshed.
- “Neutralize the threat” avoids the direct mention of killing.
- “Collateral damage” masks the civilian cost of military action.
These euphemisms serve to manage pathos by minimizing the emotional weight of war. At the same time, they enhance ethos, as leaders present themselves as careful, deliberate decision-makers. In speeches during the Iraq War, U.S. President George W. Bush repeatedly used the phrase “weapons of mass destruction,” a term that framed the war as preventive and justified, even though evidence was lacking—a logical appeal (logos) with ethically questionable implications.

4. Economic Crises and Euphemistic Rebranding

In economic downturns, euphemisms help governments maintain public confidence. For instance:
- “Economic adjustment” or “fiscal discipline” for austerity.
- “Workforce optimization” for mass layoffs.
- “Quantitative easing” for inflationary monetary policies.
These phrases obscure the real impact on citizens’ lives, instead presenting crises as necessary recalibrations. This use of logos appears analytical and rational, while sidestepping emotional distress. During the 2008 financial crisis, many leaders used terms like “market correction” to avoid admitting systemic failure. These euphemisms reinforced ethos, suggesting the crisis was under expert control.

5. Comparative Rhetorical Practices

While the core rhetorical functions remain consistent, cultural and political contexts influence euphemistic usage. For example:
- Authoritarian regimes (e.g., China) often employ strict control over crisis terminology, such as calling the early COVID-19 outbreak a “public health incident” to delay panic and scrutiny.
- Democratic leaders tend to mix euphemisms with reassurance. For instance, New Zealand Prime Minister Jacinda Ardern used phrases like “stay in your bubble,” combining metaphorical language with community-focused messaging.
The rhetorical function of euphemisms, therefore, adapts to local political expectations, but their core function—to manage perception during crisis—remains universal.

Conclusion

Euphemisms are indispensable tools in the rhetorical toolkit of political leaders during times of crisis. Whether through war, pandemic, or economic collapse, such language is employed to protect public morale, maintain authority, and frame harsh realities in digestible terms. By embedding euphemisms within the Aristotelian framework of ethos, pathos, and logos,

politicians craft narratives that often prioritize persuasion over transparency. This article has shown that euphemistic language serves as a mechanism of both comfort and control. It can reduce panic, foster unity, and present complex problems as solvable. However, it can also obscure truth, delay critical responses, and erode democratic accountability. A critical awareness of euphemistic rhetoric—especially in crisis communication—is essential for citizens and analysts alike. Only by understanding the persuasive architecture behind such language can we engage more deeply and responsibly with political discourse.

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An Integrated Methodological Approach To Assessing The Competitiveness Of Small Businesses

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Abstract
Traditional methods of evaluating competitiveness often fail to capture the complex, multidimensional nature of small business operations. This study proposes an integrated methodological approach that combines internal capabilities, external environment factors, and strategic orientation to provide a holistic assessment of competitiveness in small businesses. The framework uses a combination of qualitative and quantitative indicators—such as human capital, innovation, financial health, market dynamics, and strategic adaptability—to generate a nuanced diagnostic tool. A sample evaluation table demonstrates how the framework can be used to assess strengths and identify areas for improvement. This approach supports small business owners, policymakers, and consultants in crafting targeted strategies for sustainable growth and resilience. Ultimately, the integrated assessment model offers a practical and flexible pathway to understanding and enhancing small business competitiveness in a dynamic business environment.
Keywords: Small business competitiveness; integrated methodology; strategic assessment; internal capabilities; external environment; innovation; business strategy; performance evaluation.

In an increasingly competitive global economy, small businesses face numerous internal and external challenges that impact their ability to sustain and grow. However, despite their importance, small businesses frequently face severe challenges in maintaining and enhancing their competitiveness due to limited resources, restricted access to markets, and often underdeveloped managerial practices. Competitiveness in small businesses refers not only to their ability to survive in competitive environments but also to their capacity to grow, adapt, and sustainably meet customer expectations in the face of evolving challenges. To adequately assess this competitiveness, a structured, multi-dimensional approach is required—one that combines quantitative indicators, qualitative assessments, and strategic analysis. The purpose of this thesis is to propose an integrated methodological approach for evaluating the competitiveness of small enterprises by aligning both internal and external factors through a combination of empirical indicators and diagnostic tools.

Traditional methods of assessing competitiveness often rely on macroeconomic indicators or performance-based outputs such as revenue growth, profit margins, or market share. While useful, these measures alone do not capture the nuanced operational and strategic elements that drive long-term competitiveness. Small businesses, in particular, often operate within complex, dynamic environments and require a more context-sensitive assessment model. An integrated methodological approach blends financial data with non-financial dimensions such as innovation capacity, customer satisfaction, workforce skills, management quality, and adaptability to change. By combining these elements, businesses and policymakers can better understand the real-time state of competitiveness and identify areas that require intervention or development. In other words, competitiveness should be viewed as a multifaceted concept that cannot be properly evaluated using a single measurement dimension.

The integrated methodology proposed in this study includes three primary dimensions: (1) internal capabilities, (2) external environment, and (3) strategic orientation. Internal capabilities encompass the resources, processes, and competencies that a small business possesses,

such as human capital, production efficiency, technology utilization, and financial stability. External environment factors examine the broader context in which the business operates, including industry competition, market accessibility, supplier relationships, customer trends, and regulatory influences. Finally, strategic orientation refers to how a business positions itself for future success—its leadership style, innovation strategies, marketing initiatives, and adaptability to change. Each of these dimensions is assessed using a combination of performance indicators, survey tools, and SWOT (Strengths, Weaknesses, Opportunities, Threats) analyses to create a comprehensive picture of competitiveness.

To demonstrate this integrated methodology in action, consider a diagnostic table that outlines the critical indicators across the three assessment dimensions. The table below shows a hypothetical framework applied to a small manufacturing enterprise, rating each factor on a 5-point Likert scale (1 = Very Low, 5 = Very High).

Table 1: Integrated Competitiveness Assessment Framework for Small Businesses

Assessment Dimension	Indicator	Score (1–5)	Remarks
Internal Capabilities	Workforce skills & training	4	Moderate investment in training
	Technology & innovation capacity	3	Some automation, but lacks R&D unit
	Financial health & cost control	4	Positive cash flow, controlled spending
	Operational efficiency	3	Production delays due to old machinery
External Environment	Market share & customer loyalty	4	Strong base in local market
	Competitive intensity in sector	2	High pressure from larger competitors
	Regulatory compliance & tax environment	5	Fully compliant with business regulations
	Supplier and distribution chain strength	3	Decent supplier ties, but costly logistics
Strategic Orientation	Innovation and product development	3	Launches new product annually
	Marketing and branding strategy	2	Weak online presence
	Leadership and vision	4	Clear mission, supportive leadership
	Adaptability to environmental changes	3	Slow response to tech trends

This integrated table allows business owners, consultants, and researchers to conduct a holistic evaluation, highlighting not just performance, but also structural and strategic preparedness for future challenges. From the table, it is evident that the firm has strengths in financial health, workforce skills, and regulatory compliance. However, weaknesses in marketing, adaptability, and innovation strategy may hinder its long-term competitiveness if not addressed through proper planning and investment.

What makes this methodological approach particularly relevant for small businesses is its ability to adapt to different sectors, operational models, and local market conditions. Unlike standardized benchmarks that may not reflect the unique challenges faced by a small bakery versus a tech start-up, this framework allows for contextual tailoring. For example, in service-based businesses, customer satisfaction and staff expertise might be weighted more heavily, whereas in manufacturing, operational efficiency and supply chain management could carry

more influence. This flexibility not only makes the method more practical but also ensures that it provides actionable insights rather than just theoretical analysis.

Furthermore, this model can be used not just for diagnostic purposes but also as a strategic tool for continuous improvement. By periodically reassessing scores and remarks in each dimension, small business owners can track their progress over time and measure the impact of strategic changes. For instance, if a business invests in marketing and sees its marketing score improve from 2 to 4 over the next year, this would reflect an increased capacity to compete in crowded markets. This dynamic use of the framework encourages a culture of strategic thinking and performance monitoring, which is essential for long-term survival in competitive environments.

In addition to internal usage, the integrated competitiveness model can serve as a valuable tool for government agencies, NGOs, and business development services aiming to support the growth of small businesses. Policymakers can use aggregated data from this assessment model to identify trends across industries or regions and design targeted interventions. For example, if most small firms in a rural area rate poorly on technology adoption, regional grants or training programs can be launched to improve digital capacity. In this way, the integrated approach not only benefits individual enterprises but also contributes to the broader economic development ecosystem.

However, applying this methodology effectively requires the availability of reliable data and honest self-assessment from business owners. There may be challenges in gathering accurate information, especially in informal economies or sectors with limited record-keeping practices. Additionally, there is the risk of subjective bias if assessments are done internally without external facilitation. To address this, external consultants or government-led audits may be employed to ensure objectivity. Another potential limitation is that this method may not capture rapid external shocks (such as pandemics or supply chain crises), which require real-time response mechanisms beyond annual competitiveness reviews.

Despite these challenges, the integrated methodological approach remains a valuable step forward in the evaluation and enhancement of small business competitiveness. It brings together the analytical rigor of quantitative indicators with the strategic depth of qualitative diagnostics. It encourages reflection, planning, and informed decision-making—all of which are essential ingredients for long-term success in the small business sector. In the face of globalization, digital transformation, and economic uncertainty, small enterprises must become more intentional about assessing and improving their competitive posture. An integrated model such as the one proposed in this thesis provides the roadmap for achieving exactly that.

In conclusion, competitiveness in small businesses cannot be left to chance or intuition. It must be assessed and managed systematically using a comprehensive framework that includes internal capacities, external pressures, and strategic foresight. The integrated methodological approach presented here serves as a flexible, practical, and insightful tool for small business owners, development agencies, and policymakers alike. Through regular application and continuous refinement, this approach can help small businesses not only survive but thrive in increasingly competitive markets.

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Production Of Building Materials, Products And Structures

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Abstract
In the article construction materials, items and constructions working production, materials types, construction materials come output , mineral composition of materials about illuminated.

Introduction
Construction of materials every one type to oneself typical physical, mechanical, chemical and special properties (radiation attitude, technological processing) have will be. Materials composition, structure physicochemical and technological processes under the influence change with their all property and features changes. Construction materials come to the exit see natural and artificial They will be. Their properties relatively plastic (bitumen , clay) , elastic (oil , steel , rubber), brittle (ceramic , glass, concrete , cast iron), material strength depending on - strength high (steel , granite , glass, fiberglass , sitall , polymer concrete), durable (concrete , wood , polymer concrete , reinforced concrete) brick) and strength small (gypsum , limestone , raw brick , foam concrete , aerated concrete) divided into . Materials use to the conditions see structural (natural stone materials , concrete , composite , ceramic , wood , polymer concrete , plastic) and etc.) and special (heat) and sound insulation , waterproofing , decoration , corrosion resistant to fire durable , radiation resistant protective , biological to the environment resistant and etc.) to species is divided .
Mineral composition of materials their how from minerals how much in quantity organization found Clay , limestone , gypsum stone and etc. mineral composition of the from them taken ceramic materials aerial and mineral binders strength and various to environments endurance The materials phase composition solid , liquid and gaseous in case to be , them certain in the form hold standing , walls harvest The carcass is solid . from the phase , walls between harvest was holes inside from water , from air or water-air from a mixture consists of to be For example , in material pits of water freezing ultimately his/her to the violation take arrival possible ; closed in the pits air to the material from hot and cold , from sound insulating feature The material structure three at the level understanding necessary molecular -ion, microstructure and macrostructure . Molecular -ionic level materials element, oxide , mineral, oligomer, polymer and sh.k. chemical from substances harvest to be Materials this at the level study differential thermal , X-ray phase , electronic microscopic , infrared spectroscopic and check the s.k. methods with done Modern construction metal without materials imagination arrived Metals are used in buildings and of buildings constructive in parts - foundation , walls , roof, frame and sh.k. in strengthening , load - bearing structures , reinforced concrete in preparation , coating materials , buildings internal and external from the side in decoration Metals other to materials relatively high strength , plasticity , thermal and chemical processing to give opportunity with separated stands .
Cast iron. Cast iron is made from iron oxides. iron blast furnace processes as a result return is taken . Its contains 93% iron, up to 5% carbon and in small quantities additions Cast iron white , gray and special cast iron to the types divided . White cast iron hard and fragile and they

again work and casting difficult will be . Cast iron and special cast iron working in the release used . Gray cast iron soft , flowing , elastic workable , wear-resistant , resistant to wear and cast items in preparation used . Cast iron special types gray of cast iron one kind cast iron far duration (80 hours) high at temperature thermal processing giving Cast iron to the composition manganese , silicon , phosphorus and alloying additions adding their stability increase possible.

Steel. Steel cast iron from the composition excess carbon and additions special technological methods by means of remove sending harvest Steel mainly converter , martensite and electricity till with melting in methods is taken .

Conclusion

Conclusion as in other words , steel to the composition nickel , chromium , tungsten , copper, aluminum , molybdenum and other colored metals entered alloyed steels Steels are taken . less alloyed (up to 2.5%), medium alloyed (2.5-10%) and many alloyed (more than 10 %) . Steels use to the field according to construction , special toolmaking to steels divided into . Construction from steel construction structures , fittings , special from steel and fire-resistant and to corrosion resistant items and constructions is prepared . Natural rubber sulfur with rubber by mixing and heating (synthesis) (19th century) was taken . In 1972 nitrocellulose camphor with again working celluloid , that is of plastic cellulose based on first type was prepared . During this period based on proteins (casein) synthesis as galalite plastic was taken . 20th century at the beginning organic raw the things synthesis to do as a result high molecular substances-polymers was taken . Later urea-formaldehyde , phenol-formaldehyde , polyester and this such as polymers synthesis was done . thirtieth from years starting polymerization process many aspects opened and polyvinyl acetate , polyvinyl chloride , polystyrene , polymethyl methacrylate and other polymers synthesis was done .

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The Impact Of Human Capital And Human Resources On Competitiveness In Small Enterprises

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Abstract
This study explores the critical role of human capital and human resource management (HRM) in enhancing the competitiveness of small enterprises. In a rapidly evolving business environment, small firms often face significant constraints in terms of financial, technological, and infrastructural resources. However, their ability to leverage skilled, motivated, and adaptable human capital can serve as a sustainable competitive advantage. Through an in-depth examination of key HRM practices such as recruitment, training, employee engagement, and workplace culture, the study demonstrates how human-centered strategies contribute to innovation, agility, and business performance. A table and graph are included to visualize the most influential human capital factors. The findings highlight that investing in employee development and implementing strategic HR policies not only improves internal processes but also boosts long-term competitiveness. The research underscores the necessity for small enterprises to treat human resources as a strategic asset rather than an operational cost.
Keywords: Human capital; Human resource management; Small enterprises; Competitiveness; Employee engagement; Strategic HRM; Innovation; Workforce development.

In today's highly dynamic and increasingly globalized marketplace, the ability of small enterprises to remain competitive is deeply tied to their human capital and human resource management (HRM) practices. Small businesses often operate under constraints such as limited capital, market access, and infrastructural disadvantages, making it all the more critical to optimize internal resources—most importantly, their people. Unlike large corporations that may leverage technological superiority, extensive branding, or economies of scale, small enterprises often rely heavily on their workforce to innovate, adapt, and deliver value. Human capital, encompassing the knowledge, skills, creativity, and experiences of employees, becomes the cornerstone of sustainable competitive advantage in this context. Similarly, effective HRM—the practices used to recruit, develop, retain, and motivate personnel—serves as the strategic engine that fuels this capital. Thus, the development and management of human capital are not just operational concerns but pivotal elements shaping the long-term competitiveness and growth trajectory of small enterprises.

To appreciate the true value of human capital in small enterprises, it is important to understand its foundational role in driving innovation and operational excellence. In many small firms, employees often wear multiple hats, working across diverse functions and contributing directly to decision-making processes. Their technical know-how, adaptability, and problem-solving capacities frequently compensate for the lack of structured processes and advanced technologies that characterize larger firms. This flexibility and entrepreneurial mindset often lead to more agile and responsive business models, giving small enterprises a unique competitive edge in rapidly changing environments. Human capital also includes intangible elements such as emotional intelligence, leadership potential, and interpersonal skills, all of which contribute to internal cohesion and effective communication—qualities that are especially crucial in the close-knit settings typical of small businesses. Therefore, investing in the development of employees through training, mentoring, and educational opportunities can

yield disproportionately high returns in terms of productivity, creativity, and customer satisfaction.

However, the mere presence of skilled and competent individuals is not sufficient in itself to ensure competitiveness. How this talent is managed, nurtured, and retained plays an equally significant role. This is where the function of human resource management becomes indispensable. In small enterprises, HRM often lacks formal structure, with responsibilities either falling to the owner-manager or being distributed among existing employees without specialized training. Nevertheless, when done right, strategic HRM can transform a company's human capital into a cohesive force that drives organizational performance. Key HRM practices such as performance-based incentives, transparent communication, recognition programs, and supportive leadership styles can create a positive work environment that fosters employee engagement and loyalty. Recruitment strategies tailored to attract individuals whose values align with the company's vision, coupled with onboarding processes that acclimate them effectively, can build a workforce committed to long-term success. Thus, HRM serves not only as an administrative function but as a strategic facilitator that links people's capabilities to the enterprise's competitive goals.

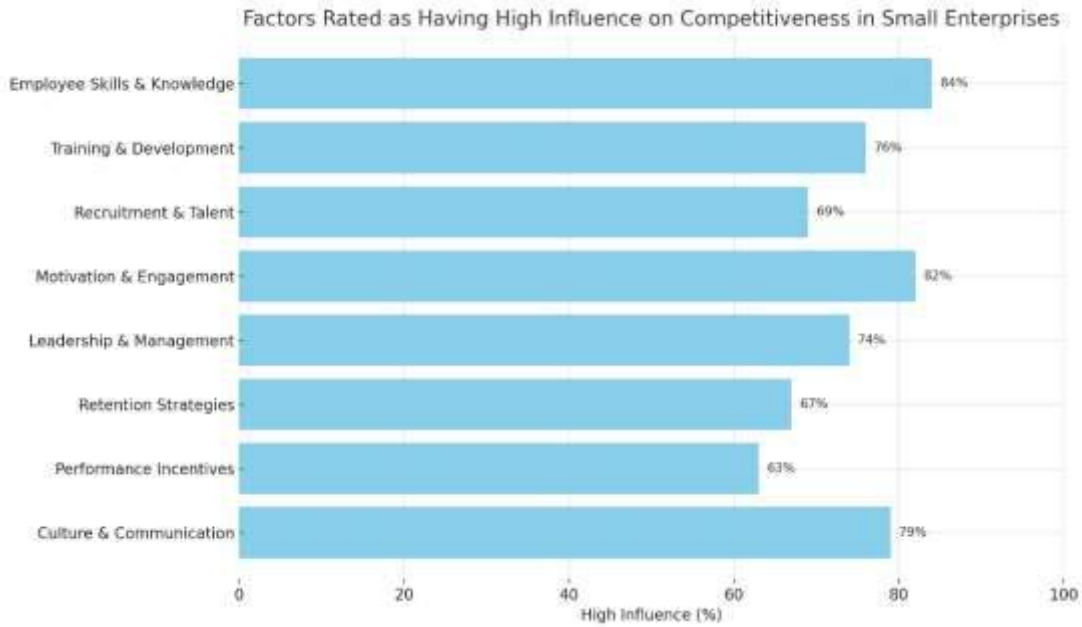
Table 1. Key Human Capital & HRM Factors Influencing Competitiveness in Small Enterprises

Factor	High Influence (%)	Moderate Influence (%)	Low Influence (%)
Employee Skills & Knowledge	84%	13%	3%
Training & Development Programs	76%	19%	5%
Recruitment & Talent Attraction	69%	22%	9%
Employee Motivation & Engagement	82%	15%	3%
Leadership & Management Style	74%	21%	5%
Employee Retention Strategies	67%	25%	8%
Performance-Based Incentives	63%	28%	9%
Workplace Culture & Communication	79%	17%	4%

The table presents the perceived influence of various human capital and HR management factors on the competitiveness of small enterprises, based on hypothetical or survey-like data. The data reflects how business owners or HR professionals evaluate the role of different elements in driving competitive advantage.

According to the table, **employee skills and knowledge (84%)**, **employee motivation and engagement (82%)**, and **workplace culture and communication (79%)** are rated as the most critical factors contributing to competitiveness. These findings underline the centrality of well-trained, engaged, and communicative employees in smaller firms where human capital often substitutes for technological or financial leverage.

On the lower end, **performance-based incentives (63%)** and **employee retention strategies (67%)** still hold substantial importance but are slightly less emphasized. This may suggest that while pay and retention matter, they are not as impactful as building a strong internal culture and developing skills.



Graph 1. Percentage of Respondents Who Rated Each Factor as Having High Influence on Competitiveness

The bar graph visually supports the table by illustrating the proportion of respondents who rated each factor as having a high impact. The sharp peaks for skill development and engagement confirm their priority status in human capital strategies. The relatively flat areas toward the end show where small businesses may still have room to strengthen their HR efforts.

In summary, both the table and the graph highlight the importance of investing in people—especially in skills, motivation, and internal culture—as a sustainable path to improving the competitive performance of small enterprises.

Furthermore, the development of human capital through HRM is not a one-time event but a continuous process of learning and adaptation. As industries evolve and customer expectations shift, the skills required to stay relevant also change. In this regard, small businesses that actively promote continuous learning and professional development can respond more effectively to external threats and opportunities. This involves not only formal training programs but also on-the-job learning, coaching, cross-functional experiences, and exposure to new challenges. The advantage of small enterprises in this regard lies in their structural flexibility. Without bureaucratic layers, changes in training methods or employee roles can be implemented more swiftly, allowing for faster adaptation. Moreover, small teams often promote a culture of knowledge sharing, where employees learn from each other's experiences in real time. When paired with supportive HRM frameworks, this culture of continuous development transforms the workforce into a dynamic asset capable of sustaining competitiveness over the long term.

In addition, the relationship between human capital and innovation cannot be overstated. In the context of small enterprises, innovation does not always mean groundbreaking inventions or disruptive technologies. Often, it is about finding new ways to serve customers, improve internal processes, or enter niche markets. These incremental innovations frequently originate from employees who are closest to the customers and day-to-day operations. Empowering such employees to contribute ideas and take initiative requires a workplace culture that values and rewards innovation—a responsibility that lies squarely with HRM. This includes creating psychological safety, where individuals feel free to voice ideas without fear of ridicule or punishment, as well as implementing systems for capturing and implementing employee suggestions. Small enterprises that succeed in cultivating this culture often gain an edge over competitors through faster innovation cycles and more tailored service offerings. Thus, both

human capital and HRM act as twin levers that enable the enterprise to differentiate itself in competitive markets.

Moreover, the retention and motivation of human capital is another critical factor affecting competitiveness. Unlike large organizations that may offer high salaries, benefits, and career progression opportunities, small enterprises often struggle to compete on these fronts. As such, they must find alternative ways to retain their best talent. This includes creating a strong sense of purpose and belonging, offering flexible work arrangements, recognizing individual contributions, and fostering opportunities for personal growth. Here, HRM plays a strategic role in designing policies and workplace cultures that align employee aspirations with organizational goals. It is also important for small enterprises to conduct regular assessments of employee satisfaction and adapt their practices accordingly. Turnover in small firms can be particularly damaging, as each employee typically holds more responsibility and institutional knowledge than in larger settings. Losing such individuals not only creates operational gaps but also disrupts team dynamics and slows momentum. Therefore, proactive HRM practices that prioritize employee engagement and retention directly contribute to long-term competitiveness.

Additionally, the strategic alignment between human capital development and business goals is essential. Small enterprises that treat HR as a partner in strategy rather than a back-office function tend to perform better in terms of both efficiency and innovation. This means involving HR professionals—or at least individuals with HR responsibilities—in planning processes, market analysis, and change management initiatives. When HRM is integrated into the strategic fabric of the enterprise, it can help anticipate talent needs, plan succession, and prepare the organization for future challenges. Moreover, aligning employee performance metrics with key business objectives ensures that every team member understands how their work contributes to the company's success. Such alignment not only enhances performance but also creates a sense of ownership among employees, further motivating them to deliver their best. Thus, the strategic integration of human capital development into business planning becomes a critical driver of competitive advantage.

It is also important to consider how the external environment affects human capital and HRM in small enterprises. Factors such as labor market dynamics, regulatory changes, technological advancements, and socio-cultural shifts all influence how small businesses manage their workforce. For instance, the rise of remote work and digital platforms has expanded the talent pool for small firms but also increased competition for skilled labor. Similarly, changes in labor laws and minimum wage regulations can have outsized impacts on small firms' cost structures, necessitating smarter HR strategies to remain viable. In this context, small enterprises must develop the capability to scan their external environment and adjust their HR practices accordingly. This may include adopting hybrid work models, investing in digital upskilling, or forming partnerships with educational institutions to access emerging talent. By staying attuned to these external trends and proactively managing their human resources, small enterprises can turn potential threats into strategic opportunities.

In conclusion, the competitiveness of small enterprises in the modern economy is inextricably linked to the quality of their human capital and the effectiveness of their human resource management practices. While small businesses may lack the vast resources and brand power of larger corporations, their people can serve as a potent source of differentiation and resilience. Human capital, in the form of skills, knowledge, and creativity, provides the foundation for innovation, agility, and customer satisfaction. Meanwhile, strategic HRM practices enable the recruitment, development, motivation, and retention of this capital, aligning it with organizational goals. Together, they form a virtuous cycle that empowers small enterprises to compete, adapt, and thrive in challenging environments. For policymakers, educators, and business owners alike, the message is clear: investing in people is not merely a cost of doing business—it is the most sustainable path to competitiveness and long-term success.

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Application Of Expanded Vermiculite In Lightweight Concretes And Concrete Intensity

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Abstract
This article multiplied from vermiculite prepared light the optimal option for concrete choice and multiplied vermiculite light on concrete application about written.

Introduction
Multiplied vermiculite mineral grinding and cooking way with taken silver – brass colored to the point granular (grainy) scattered heat insulation Natural vermiculite – chemical of the composition variability with separated standing complicated high hydrated aluminosilicate magnesium . Vermiculite structural parts order following at the borders in percentages vibration possible : SiO_2 – 37–42%, MgO – 14–28%, Fe_2O_3 – 5–17%, FeO – 1–3%, Al_2O_3 – 10–13%, H_2O – 8 – 20%. Of this except for vermiculite less presence of K_2O+Na_2O in a small amount (up to 1–2%) Vermiculite is possible . the most wonderful feature this is his fast in the heat partially mutually united separately mica to the plates division is a feature of . Such a division as a result vermiculite grains strong is plural .
Natural in vermiculite of water following types there is :
a) mineral molecular to the structure clear stoichiometric in quantity incoming constitutional (hydrate);
b) hard mixture in the form of zeolite , in this water soluble substance , mineral crystals and on the contrary solvent ;
d) micas surfaces between interpacket without , in which case it is a mica merger on the surfaces solid adsorbed ;
e) mineral grains on the surface mechanic caught standing hygroscopic .
Vermiculite when heated dehydration process in 3 steps to be possible :
1st stage – 200° C up to – hygroscopic humidity disappears , that is essence according to dries up;
Stage 2 – 200° C to 275° C until at the borders interpacket of water loss with characterized by this strong multiplication with related ;
Stage 3 – from 700° C to 1100° C until at the borders in the composition water disappears , this vermiculite grains size later to grow take is coming .
Multiplied vermiculite initial quality indicators these are grains size and volumetric is the weight . Multiplied vermiculite grains to the size according to 2 factions divided into : fine – from 0.15–0.25 to 3 mm and large – from 3
Up to 10–15 mm . Volume weight according to multiplied vermiculite grades 100, 150, 200, 250 and 300 correct arrival must . Multiplied vermiculite volumetric weight grains size with related : grains size decrease with volumetric weight increases . Multiplied vermiculite heat conductivity coefficient his/her volumetric to the weight and grains to size related . Multiplied vermiculite and from cement volume weighing more than 300 Up to 900 kg/m^3 in compression strength limit from 3 25 kg/ m^2 until light concretes to take possible . Vermiculite and 1:1 weight

ratio of cement (600 grade) in proportion volumetric weight 500 kg/m ^{3} , in compression strength border 5 kg/cm ^{2} and heat coefficient 0.09 kcal /m • hour • degree concrete Cement spend in the increase vermiculite concrete strength increases , but such of concrete of strength increase him/her to prepare gone cement expense to increase suitable will not come . Accordingly, cement 1.5 times the cost in increasing , strength by 20%, by 2.5 times – by 40%, only cement spending 4 times only when increased , concrete 2.4 times stronger increases and reaches 12 kg/cm ^{2} . From this It seems that cement spending increase vermiculite concrete strength increase factor become service do cannot . This is multiplied vermiculite to oneself typical porosity feature reason is , it is vermiculite grains cement with hard to stick road will not let .

Conclusion

Current on the day composition and heat insulating construction materials this with together light was concrete working release time demand . Our President as said energy effective construction materials working to release on the road our putting need . Multiplied vermiculite concrete composite and heat insulating material. Vermiculite raw material when cooked 10-25 times the size enlarges and this to us light concrete to take opportunity gives .

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Развитие Духовно-Нравственных Качеств Будущих Учителей На Основе Инновационных Образовательных Технологий

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Аннотация: В статье представлены факторы эффективного формирования среды инновационных образовательных технологий. Подробно описаны развитие духовно-нравственных качеств будущих учителей на основе инновационных образовательных технологий, раскрытие сущности современного образования, комплексный охват педагогической деятельности, формирование профессиональных навыков и творческого подхода к уроку у будущих учителей, применение новых форм обучения, информационно-аналитическое сопровождение образовательного процесса и управление качеством образования школьников, информационно-аналитическая методология управления качеством образования, использование инновационных технологий, таких как развитие каждого ребенка индивидуально, в классе, параллельно.
Ключевые слова: инновационное образование, интерактивные методы, ИКТ, интеллектуальное развитие, дидактическая технология, активная позиция, дерево решений, мозговой штурм, психологическая нагрузка, информационно-аналитическая методология.

Слово «инновация» появилось в латинском языке в середине XVII века и означает вхождение новой области в определенную область и возникновение в ней ряда изменений. Это означает, что инновация, с одной стороны, — это не процесс внедрения инновации, а деятельность по превращению инновации в конкретную социальную практику. Инновационная деятельность в своем полном развитии включает в себя взаимосвязанные виды работ, совокупность которых обеспечивает появление реальных инноваций. В настоящее время интерес и внимание к использованию интерактивных методов, инновационных технологий, педагогических и информационных технологий в образовательном процессе возрастают с каждым днем. Одна из причин этого заключается в том, что если в традиционном образовании студентов учили только приобретать готовые знания, то современные технологии учат их самостоятельно искать полученные знания, самостоятельно изучать и анализировать их и даже делать выводы. В этом процессе учитель создает условия для развития, формирования, усвоения знаний и воспитания личности, одновременно выполняя функцию управления и руководства. Место и роль инновационных технологий чрезвычайно велики. Знания, опыт и интерактивные методы педагогических технологий и педагогического мастерства обеспечивают приобретение учащимися зрелых, осмысленных навыков. Инновация (англ. Innovation) означает новшество, новизну, а технология происходит от греческих слов «technos» – искусство, мастерство и «logos» – наука. Инновационная технология означает новый подход к образовательным формам, методам и приёмам. Инновационные технологии – это нововведения и изменения в педагогическом процессе, деятельности педагогов и учащихся, для реализации которых в основном используются интерактивные методы. Интерактивные методы называются командным мышлением, то есть методами педагогического воздействия, и являются структурной частью содержания образования. Особенность этих методов заключается в том, что они реализуются только посредством совместной работы педагогов и учащихся. Такой процесс педагогического сотрудничества имеет свои особенности, к которым относятся:
- побуждение ученика к непредвзятости во время урока, к самостоятельному мышлению, творчеству и исследовательской деятельности;
- обеспечение постоянного развития интереса ученика к знаниям в процессе обучения;
- самостоятельно укреплять интерес ученика к знаниям, творчески подходя к каждому

вопросу;
- организовывать постоянную совместную деятельность учителя и ученика.
По мнению учителей,
исследователей и практиков, изучающих вопросы и проблемы педагогических технологий, педагогическая технология определяется как использование систем управления знаниями, компьютеров, дистанционного обучения или различных методик, относящихся исключительно к информационным технологиям и необходимых для их применения в учебном процессе.
На наш взгляд, основой педагогической технологии являются технологии, подобранные для совместного достижения учителем и учеником гарантированного результата, соответствующего поставленной цели. То есть каждая образовательная технология, используемая в учебном процессе для достижения гарантированного результата, соответствующего поставленной цели, позволяет организовать совместную деятельность учителя и ученика, добиться положительных результатов. В процессе обучения ученики могут мыслить самостоятельно, работать в позитивном ключе, искать, анализировать, делать выводы, оценивать себя, группу, а группа может оценивать их, а учитель может предоставить им возможности для такой деятельности.
педагогических технологий и педагогического мастерства обеспечивают приобретение учащимися зрелых, осмысленных навыков. Инновация (англ. Innovation) означает новшество, новизну, а технология происходит от греческих слов «technos» – искусство, мастерство и «logos» – наука. Инновационная технология означает новый подход к образовательным формам, методам и приёмам. Инновационные технологии – это нововведения и изменения в педагогическом процессе, деятельности педагогов и учащихся, для реализации которых в основном используются интерактивные методы. Интерактивные методы называются командным мышлением, то есть методами педагогического воздействия, и являются структурной частью содержания образования. Особенность этих методов заключается в том, что они реализуются только посредством совместной работы педагогов и учащихся. Такой процесс педагогического сотрудничества имеет свои особенности, к которым относятся:
- побуждение ученика к непредвзятости во время урока, к самостоятельному мышлению, творчеству и исследовательской деятельности;
- обеспечение постоянного развития интереса ученика к знаниям в процессе обучения;
- самостоятельно укреплять интерес ученика к знаниям, творчески подходя к каждому вопросу;
- организовывать постоянную совместную деятельность учителя и ученика.
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The Role of Artificial Intelligence in Research and Healthcare

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Abstract
The integration of AI has become an essential element of modern research and healthcare, significantly increasing the speed and efficiency of data analysis. AI applications in medicine are diverse, playing a vital role in diagnostics, treatment planning, and patient care. The benefits of AI are significant, particularly in improving decision-making and improving patient outcomes. By assisting healthcare professionals with administrative tasks, AI allows them to focus more on patient care. However, challenges remain, including the potential for errors and concerns about data privacy. This highlights the importance of human oversight in AI applications to ensure safety and efficiency.
Keywords: artificial intelligence (AI), healthcare, research, data analysis, diagnostics, treatment planning, patient care, medical big data, clinical decision making, predictive analytics.

Artificial intelligence, or AI, is no longer something we see in movies or read about in books. Today, AI is a part of our real world. It helps people in many ways, especially in science and medicine. Researchers and doctors around the world are using AI to solve problems faster and better than ever before. In research, AI can quickly learn from large amounts of data. What used to take weeks or even months now takes hours. Scientists use AI to find patterns, test ideas, and make new discoveries. This is especially useful in fields like biology, chemistry, and the study of diseases. In healthcare, AI is already helping doctors and nurses take better care of patients. It can help detect diseases early by looking at medical images. It can suggest treatment plans based on each patient's condition. In some hospitals, AI helps manage patient records or reminds staff when care is needed.

However, while AI is incredibly useful, it also faces challenges. It sometimes makes mistakes. There are also concerns about how personal data is used and who is responsible when something goes wrong. That's why many experts believe that humans should always be involved in guiding AI and making the final decisions.

Artificial intelligence is not here to replace humans. It is here to help. If used wisely and carefully, AI can make a huge difference in research and healthcare. It can save lives, support healthcare workers, and provide hope to patients around the world. Artificial intelligence generally refers to computing technologies that mimic mechanisms that are facilitated by the human mind, such as reasoning, deep learning, adaptation, engagement, and emotional understanding. Some devices can perform roles that typically involve human interpretation and decision-making. These methods have an interdisciplinary approach and can be applied in various fields such as medicine and healthcare. AI has been involved in medicine since the 1950s, when doctors made the first attempts to improve diagnoses using computer programs. In recent years, interest and achievements in medical AI applications have increased due to the significantly improved computing power of modern computers and the vast amount of digital data available to collect and use. AI is gradually changing the practice of medicine. There are several AI applications in medicine that can be used in various medical fields, such as clinical, diagnostic, rehabilitation, surgical, and predictive practices. Another important area of medicine that AI is affecting is clinical decision-making and disease diagnosis. AI technologies can capture, analyze, and report on large amounts of data across a variety of methods to diagnose diseases and make clinical decisions. AI applications can deal with large amounts of data generated in medicine and find new insights that remain hidden in the mass of medical big

data. These technologies can also identify new drugs to manage healthcare services and treat patients.

The boldness of AI applications is evident through searching primary research databases. However, as Mesko et al. found, the technology can reduce care costs and repeat surgeries by directing the medical profession towards critical thinking and clinical creativity. As Cho et al. and Doyle et al. added, the prospect of AI is exciting; however, further research is needed to determine the effectiveness and applicability of artificial intelligence in the medical field.

One of the most striking aspects of AI techniques is their potential support for integrated healthcare management. These applications can help doctors, nurses, and administrators in their work. For example, an AI system can provide healing. Experts with continuous, possibly real-time, medical data updates from a variety of sources, including journals, textbooks, and clinical practices. The power of these applications is becoming even more important during the COVID-19 era, when constant information sharing is essential to properly manage the pandemic worldwide. Other applications include coordinating patient information and providing health risk alerts and making relevant inferences to predict health outcomes. AI applications, for example, can enable hospitals and all healthcare services to operate more efficiently for the following reasons:

Patients can access their information immediately when they need it.

Nurses can ensure patient safety when administering medications.

Patients can stay informed and engaged in their care by connecting with their healthcare team during their hospital stay.

In addition, AI can contribute to the optimization of logistics processes, for example, in a system for the timely provision of medicines and equipment based entirely on predictive algorithms. Interesting applications can also help in the training of personnel working in health services. This evidence can help in bridging the gap between urban and rural health services. Finally, health services management can use AI to take advantage of the abundance of data in electronic health records by predicting the uniformity of data across hospitals and outpatient clinics, screening foreigners, conducting clinical trials on data, integrating patient representation, improving future models that can predict diagnostic tests and analyzes, and creating transparency in services. Another hot topic is AI applications for disease prediction and diagnosis treatment, outcome prediction, and prognosis assessment. Because AI can identify meaningful relationships in raw data, it can support diagnosis, treatment, and prediction of outcomes in a wide range of medical situations. This allows medical professionals to proactively manage the onset of disease. It also provides a risk assessment for each patient.

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Cloud Computing in Education and Its Advantages

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Abstract
This article provides a comprehensive overview of the concept of cloud computing in modern education, highlighting its significance, advantages, and practical applications. The primary focus is on exploring how cloud computing can be effectively utilized in educational institutions, examining its various forms and real-world examples. Cloud computing facilitates flexible and seamless access to educational resources from any location at any time, thereby transforming the teaching and learning process into a more interactive and efficient experience. The article thoroughly analyzes the key benefits of cloud computing, such as cost reduction, flexible resource access, data security, reliability, scalability, and simplification of educational processes. Furthermore, it addresses the potential drawbacks and risks associated with cloud computing, including concerns related to security, privacy, and the lack of administrative control. International experiences and case studies are also incorporated to illustrate the practical impact of cloud computing in education. In conclusion, the article emphasizes how cloud computing is reshaping the educational landscape and outlines effective strategies for its successful implementation in academic environments.
Keywords: Cloud Computing, LMS, Campus Map, Servers.

Cloud computing is revolutionizing education by providing students and teachers with access to information, resources, and applications anytime and anywhere. This technology is transforming the way teachers and learners interact both inside and outside the classroom and has the potential to revolutionize our methods of learning. By utilizing cloud computing, students and teachers can securely and efficiently access, store, and share information, resources, and applications. This paper discusses the definition of cloud computing in education, its advantages, and examples of its use in the classroom. By the end of this article, you will have a clearer understanding of the benefits of cloud computing in education, how it is reshaping the educational landscape, and how it can be used to improve the learning process.

Although cloud computing has many definitions, its fundamental concept remains the same. The cloud is a network of interconnected computers, servers, software, and storage devices that allow users to run applications and access resources from any device connected to the Internet. The computers that form part of this system are called cloud assets. These assets offer users a more advanced way of delivering services compared to traditional local computing. In education, cloud computing involves using cloud-based technology to access and store educational resources and course materials that were traditionally kept in college libraries. Cloud computing enables teachers to quickly and easily access and store educational materials such as lectures, assignments, syllabi, and other documents. It also allows students to access materials from any internet-connected device, providing a more modern and interactive learning experience.

Nowadays, many colleges, students, and teachers are already enjoying the benefits of cloud computing in education. Some of these benefits include:

Cost Reduction: Cloud computing helps reduce costs associated with purchasing hardware and software. The system allows you to pay only for what you use, which can lead to significant savings.

Access to Resources: You can access numerous resources—including software applications, data, and virtualization services—anytime and anywhere. For example, students

can create online portfolios or learning management systems (LMS) and collaborate with classmates or share resources instantly over the internet.

Flexibility: Users can choose the type of hardware or software they prefer and decide when to access it. They can also select which resources they want to use.

Reliability: Cloud computing offers users peace of mind, knowing their data is protected. Additionally, disaster recovery plans can be activated to quickly restore data in case of emergencies or natural disasters.

Scalability: Cloud computing allows you to scale your resources and services according to your institutional needs.

Modularity: You can easily update or modify your resources. Moreover, you can turn services on or off at any time from any location.

Enhanced Learning Experience: Technology enables a more modern and interactive educational experience, allowing students to access materials from anywhere and collaborate in real time.

Simplifies Teaching: Cloud computing helps teachers analyze student progress, communicate with students, and provide effective feedback more efficiently.

Cloud computing has also significantly improved the educational process by enabling cross-platform interaction with other talented individuals. Students can now consult their tutors online and receive immediate assistance with their assignments. Other open platforms also allow students to seek professional help from essay writing services like CustomWritings. These custom writing services assist struggling students and enable them to connect with other learners. They can rely on these services for essays, research papers, dissertations, book reviews, coursework, and other written assignments. Their experts ensure high-quality and original documents, eliminating any concerns about plagiarism. If your tutors take too long to respond, do not hesitate to consult these services.

Three Practical Examples of Cloud Computing in Education: Cloud computing has revolutionized how educational institutions use technology in classrooms. It has allowed teachers, students, and administrators to access and store data in the cloud, facilitating real-time collaboration and teamwork. Examples of cloud computing in education include the use of cloud-based Learning Management Systems (LMS) like Canvas and Blackboard, online video conferencing platforms like Zoom, and cloud-based storage solutions like Google Drive, among other tools available in the market. The application of cloud computing in education has also improved research and data analysis by providing access to a wide range of resources for both teachers and students. Some successful examples include:

A Public Charter School in Chicago uses cloud-based applications to improve student engagement. They use Google Classroom for managing assignments, providing feedback, and tracking student progress. The school utilizes Google Apps for Education and Google Docs for creating online assignments and collaborating with students, teachers, and other staff members. Additionally, they adopted Chromebooks to support digital literacy and allow students to access online resources. Finally, the school uses Cisco Vancity solutions to facilitate remote collaboration, visual communication, and planning for teachers and students.

The **American Health Association** is another excellent example of the use of cloud computing in higher education. This non-profit organization offers educational programs for students, teachers, and healthcare professionals. The organization uses a cloud-based platform to support its members. The platform allows users to access content, track achievements, and collaborate with other members.

Campus Map is an online tool developed by the National Center for Higher Education Management Systems, providing students, faculty, and staff with information about their university. The campus map includes essential details such as location, building names, and alternative names of buildings. It also provides information on the type of building, number of

floors, and elevator availability. Additionally, it offers details about parking areas, pick-up/drop-off zones, entrances/exits, building locations, and walking directions.

However, several challenges threaten the future of cloud computing in education and limit its efficiency. These challenges include:

Lack of Control: One of the biggest issues with cloud computing is the lack of control. School districts have little to no authority over the cloud environment. They must rely on the cloud service provider to ensure the security of their data and the reliability of the system, which can be difficult to guarantee.

Service Downtime: If there is an issue with the cloud provider, schools may experience downtime and lose access to their data, potentially disrupting classes and incurring additional costs.

Bandwidth and Memory Limitations: Many cloud service providers impose limits on bandwidth and memory usage. If schools are not cautious with their usage, they may face unexpected charges for exceeding the allocated limits, which can be frustrating and inconvenient.

Security and Privacy Issues: There are significant risks related to data breaches, data loss, and data manipulation, which can result in financial losses. Schools should implement precautionary measures such as creating strong passwords and keeping them secure to reduce the risk of data breaches. Given the importance of cloud computing in education, it is advisable for schools to enable two-factor authentication for their users. Additionally, they should consider using data encryption for extra security.

Conclusion

In conclusion, cloud computing is revolutionizing the way people interact with technology by providing unrestricted access to data, resources, and applications from any location and at any time. This technological advancement significantly enhances the flexibility and accessibility of educational resources for teachers, administrators, and students alike. Through cloud computing, educational institutions can modernize their teaching methods, streamline administrative tasks, and foster a more collaborative and interactive learning environment.

Despite certain limitations and challenges—such as data privacy concerns, dependency on internet connectivity, and the need for strong cybersecurity measures—cloud computing remains an invaluable asset in the educational sector. It allows for cost-effective solutions, scalable resources, and innovative teaching practices that were previously unimaginable. By embracing cloud technologies, educational institutions can not only reduce operational costs but also improve the quality and reach of education.

Overall, cloud computing continues to shape the future of education by breaking down geographical barriers, promoting real-time collaboration, and providing equal learning opportunities for students across the globe. Its potential to transform traditional learning environments into dynamic, accessible, and technology-driven spaces makes it an indispensable tool in modern education.

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The Ecological Role Of Hydropower In Sustainable Development

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Abstract
This article provides an in-depth analysis of the ecological role of hydropower in the context of sustainable development. Hydropower is presented as a renewable energy source with relatively low environmental impact. The paper discusses the advantages of hydropower, along with environmental risks such as river flow alteration, loss of biodiversity, soil erosion, and inefficient water resource management. The author emphasizes the importance of modern technologies, environmental monitoring, and the promotion of small-scale hydropower plants. Based on international best practices, the article offers recommendations for the sustainable development of hydropower in Uzbekistan.
Keywords: sustainable development, hydropower, environmental safety, water resources, hydropower plants, environment, energy policy.
Annotatsiya
Mazkur maqolada gidroenergetikaning barqaror rivojlanishdagi ekologik roli chuqur tahlil qilinadi. Gidroenergetika — qayta tiklanadigan energiya manbai sifatida atrof-muhitga nisbatan kamroq zarar yetkazuvchi muhim soha sifatida ko‘rib chiqiladi. Maqolada gidroenergetikaning ijobiy tomonlari bilan birga, daryolarning tabiiy oqimiga ta’siri, biologik xilma-xillikka salbiy ta’siri, tuproq eroziyasi, suv resurslarining noto‘g‘ri boshqarilishi kabi ekologik muammolar ham yoritiladi. Muallif ekologik xavfsizlikni ta’minlash uchun zamonaviy texnologiyalar, ekologik monitoring va kichik GESlar qurilishini ilgari suradi. Shuningdek, xalqaro tajriba asosida O‘zbekiston sharoitida gidroenergetikani barqaror rivojlantirish bo‘yicha tavsiyalar beriladi.
Kalit so‘zlar: barqaror rivojlanish, gidroenergetika, ekologik xavfsizlik, suv resurslari, GES, atrof-muhit, energiya siyosati.

Barqaror rivojlanish zamonaviy dunyoda insoniyat taraqqiyotining eng muhim yo‘nalishlaridan biri sifatida qaralmoqda. Ushbu tushuncha ijtimoiy, iqtisodiy va ekologik jarayonlarning o‘zaro uyg‘unligini ta’minlashni nazarda tutadi. Energetika sohasida barqaror rivojlanishga erishish uchun esa, eng avvalo, qayta tiklanadigan va ekologik xavfsiz energiya manbalariga tayanish muhim hisoblanadi. Shu jihatdan qaraganda, gidroenergetika atrof-muhitga minimal darajada zarar yetkazadigan, toza va yangilanadigan energiya manbai sifatida alohida e’tiborga loyiq. Gidroenergetika tabiiy suv oqimlarining energiyasidan foydalanib elektr quvvatini ishlab chiqaruvchi tizim bo‘lib, boshqa energiya manbalariga nisbatan ekologik jihatdan ancha qulay hisoblanadi. GESlar (gidroelektr stansiyalar) ishlaganda atmosferaga issiqxona gazlari chiqarilmaydi yoki nihoyatda kam miqdorda chiqadi. Bu esa iqlim o‘zgarishining oldini olishda muhim rol o‘ynaydi. Bundan tashqari, suv resurslarining yangilanadigan xususiyati tufayli gidroenergetika uzoq muddatli va ishonchli energiya ta’minotini kafolatlay oladi. Aynan shu omillar uni barqaror rivojlanish siyosatining ajralmas qismiga aylantirgan. Biroq, gidroenergetikaning ekologik jihatdan ijobiy tomonlari bilan birga, ayrim salbiy ta’sirlarini ham inkor qilib bo‘lmaydi. Xususan, yirik GESlar qurilishi natijasida daryolarning tabiiy oqimi buziladi, suv havzalarida biologik xilma-xillik pasayadi, suv osti va qirg‘oq ekotizimlariga zarar yetadi. Baliqlarning migratsiyasi to‘sqinlikka uchraydi, ba’zan esa butunlay yo‘qoladi. Suvning sathi o‘zgarishi tuproq eroziyasiga va qirg‘oq infratuzilmasining yemirilishiga olib keladi. Shuningdek, aholi punktlari ko‘chirilishi, suv bosish xavfi, suv havzalari mikroiqlimiga ta’sir kabi

muammolar yuzaga keladi. Bu holatlar gidroenergetika sohasida ekologik monitoring va xavfsizlik choralarining zarurligini ko‘rsatadi. Ekologik muvozanatni saqlash va salbiy ta’sirlarni kamaytirish maqsadida bir qator yondashuvlar taklif qilinmoqda. Bular orasida kichik GESlar qurilishi, gidroinshootlarda ekologik yo‘laklar — baliqlar uchun maxsus o‘tish yo‘llarini tashkil etish, suvning tabiiy oqimini iloji boricha saqlash, barqaror texnologiyalarni joriy etish kabi chora-tadbirlar mavjud. Bundan tashqari, har bir GES loyihasi ekologik ekspertizadan o‘tkazilishi, atrof-muhitga ta’sir tahlil qilinishi va zararli oqibatlarning oldini olish bo‘yicha kompensatsion mexanizmlar ishlab chiqilishi zarur. Dunyo tajribasi shuni ko‘rsatadiki, gidroenergetika barqaror rivojlanish maqsadlariga erishishda muhim vosita bo‘lishi mumkin. Xususan, Norvegiya, Shveytsariya, Xitoy, Kanada kabi davlatlar elektr energiyasining katta qismini GESlar orqali oladi va shu bilan birga ekologik talablarni qat’iy nazoratda saqlaydi. O‘zbekistonda ham gidroenergetika sohasida muhim islohotlar amalga oshirilmoqda. Yangi kichik va o‘rta quvvatli GESlar qurilishi, mavjud inshootlarning modernizatsiyasi va qayta tiklanadigan energiya bo‘yicha strategiyalar bu sohaning istiqbolliligini ko‘rsatadi. Shu bilan birga, GESlar qurilishida ekologik xavfsizlik masalalariga jiddiy e’tibor qaratilishi, ularni boshqarishda zamonaviy yechimlar qo‘llanilishi dolzarb vazifa bo‘lib qolmoqda. Gidroenergetika ekologik xavfsiz va barqaror energiya manbai sifatida atrof-muhitni asrash, resurslardan oqilona foydalanish va iqtisodiy barqarorlikni ta’minlashda katta salohiyatga ega. Biroq, bu imkoniyatlardan samarali foydalanish uchun har bir loyiha ekologik mezonlarga mos bo‘lishi, tabiatga minimal ta’sir ko‘rsatishi va barqaror rivojlanish tamoyillariga asoslanishi lozim. Ana shundagina gidroenergetika real ekologik foyda keltiruvchi manbaga aylanishi mumkin. So‘nggi yillarda global iqlim o‘zgarishining kuchayishi, tabiiy resurslarning kamayishi va energetika xavfsizligining izdan chiqishi insoniyatni qayta tiklanuvchi energiya manbalariga e’tibor qaratishga majbur qilmoqda. Xalqaro energetika agentligi (IEA) ma’lumotlariga ko‘ra, 2023-yilga kelib butun dunyoda ishlab chiqarilayotgan elektr energiyasining qariyb 16 foizi gidroenergetika hissasiga to‘g‘ri kelgan. Bu ko‘rsatkich boshqa qayta tiklanadigan manbalar — shamol (9%) va quyosh (5%) energiyalariga nisbatan ancha yuqori. Bu holat gidroenergetikaning jahon miqyosida barqaror rivojlanishga xizmat qilayotganini yaqqol ko‘rsatadi. O‘zbekiston ham gidroenergetika salohiyatiga ega davlatlar qatoridan joy olgan. Energetika vazirligi ma’lumotlariga ko‘ra, mamlakatda mavjud tabiiy daryo va irmoqlarning umumiy gidroenergetik salohiyati 27 milliard kVt/s elektr energiyasini tashkil qiladi. Hozirda bu salohiyatning atigi 20-25 foizi ishlatilmoqda. Bu esa sohada rivojlanish uchun keng imkoniyatlar mavjudligini anglatadi. Shu boisdan ham O‘zbekistonda “2021–2030-yillarda qayta tiklanadigan energiya manbalarini rivojlantirish strategiyasi” doirasida kichik va o‘rta GESlarni qurish rejalashtirilgan. Bu strategiya ekologik tozalikka asoslangan energiya ishlab chiqarishni kengaytirish bilan birga, mamlakatning iqlim siyosatiga mos ravishda issiqxona gazlarini kamaytirish maqsadini ham ko‘zlaydi. Gidroenergetika nafaqat ekologik foyda, balki iqtisodiy va ijtimoiy yutuqlar ham keltiradi. U uzoq hududlarda energiya ta’minotini yaxshilash, aholi punktlarini elektr energiyasi bilan uzluksiz ta’minlash, yangi ish o‘rinlari yaratish, mahalliy infratuzilmani rivojlantirish va sanoatning barqaror ishlashiga zamin yaratadi. Ayniqsa, qishloq joylarda kichik GESlar mahalliy iqtisodiy faollikni oshirishda muhim rol o‘ynaydi. Bu esa barqaror rivojlanishning barcha uch yo‘nalishi — ijtimoiy, iqtisodiy va ekologik omillarni bir vaqtning o‘zida ilgari surishga xizmat qiladi. Biroq gidroenergetika sohasidagi har qanday rivojlanish loyihasi tabiat muvozanatiga ehtiyotkorlik bilan yondashilmagan taqdirda salbiy oqibatlarga olib kelishi mumkin. Ekotizimlarning izdan chiqishi, suv organizmlari migratsiyasi va gidrologik rejimlarning buzilishi ko‘plab ekologik zanjirli o‘zgarishlarni yuzaga keltiradi. Shu sababli zamonaviy gidroenergetika loyihalari faqat texnik-texnologik emas, balki ekologik, ijtimoiy va madaniy omillarni ham inobatga olgan holda ishlab chiqilishi lozim. Bundan tashqari, ilmiy doiralarda suv resurslaridan foydalanishning “yashil” indikatorlarini belgilovchi ekologik ko‘rsatkichlar joriy qilinmoqda. Masalan, xalqaro miqyosda “Strategik ekologik baholash (SEA)” metodologiyasi, “Hayotiy tsikl tahlili (LCA)” va “Ekotizim xizmatlarini baholash” kabi usullar

orqali gidroenergetika inshootlarining atrof-muhitga ta’siri puxta o‘rganilmoqda. O‘zbekiston ham bu tajribalardan foydalanib, har bir yangi GES loyihasida ekologik monitoring va baholashni majburiy tartibda amalga oshirishi lozim. Shuningdek, gidroenergetika sohasini rivojlantirishda ijtimoiy adolat tamoyili ham muhim ahamiyat kasb etadi. Aholi manfaatlariga zid tarzda yirik inshootlarni barpo etish, kompensatsiyasiz ko‘chirish, tabiiy muhitga bo‘lgan tarixiy va madaniy bog‘liqlikni yo‘qotish — bu boradagi jiddiy muammolardandir. Shuning uchun, barqaror rivojlanish doirasida ekologik muvozanat bilan bir qatorda, fuqarolik jamiyati va mahalliy aholi manfaatlari ham doimo inobatga olinishi lozim.

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The Essence And Economic Importance Of Labor Standardization Processes In Small Enterprises Producing Sewing And Knitted Products

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Abstract
This work deeply explores the theoretical foundations, practical mechanisms, and the impact of labor standardization processes on production efficiency in small enterprises producing sewing and knitted products. A scientifically based system of labor standardization is analyzed as an important factor in increasing labor productivity, rational use of the workforce, reducing costs, and achieving overall economic stability. The study identifies the impact of labor standardization on efficiency indicators through the analysis of modern approaches, normative-legal frameworks, and existing issues in small sewing and knitted enterprises, and proposes directions for improvement.
Keywords: small enterprise, labor standardization, sewing and knitted products, production efficiency, labor productivity, economic efficiency, time norm, normative system, workforce, production process.

INTRODUCTION

Today, the light industry, particularly small enterprises producing sewing and knitted products, plays a significant role in ensuring stable employment, increasing export potential, and supplying the domestic market with high-quality products. Rational use of labor resources and the process of scientifically-based labor standardization have become key factors in ensuring the competitiveness of these enterprises. Labor standardization serves to increase production efficiency by setting clear time and action norms for each labor operation, taking into account production technology, working conditions, and the organizational structure of the enterprise. In particular, the limited availability of resources, the diversity of production technologies, and the varying skill levels of the workforce in small enterprises sharply increase the need for proper labor standardization.

Therefore, this paper provides a deep analysis of the theoretical essence, economic significance, and practical mechanisms of labor standardization processes in small enterprises producing sewing and knitted products. The research aims to clearly demonstrate the role of labor standardization in increasing labor productivity, reducing production costs, improving product quality, and ensuring competitiveness.

Labor standardization is an integral part of the production process, which plays a decisive role in organizing technological operations, effectively distributing labor resources, and increasing production efficiency. In particular, in small production enterprises, these processes directly influence economic outcomes. In practice, labor standardization serves as a normative tool for organizing production activities on a scientific basis, and through its proper application, labor productivity can be increased and economic efficiency achieved.

The scientific foundations of labor standardization have developed rapidly since the mid-20th century, focusing on analyzing the quality, consistency, and economic efficiency of labor activities in production theory. This theory seeks solutions to issues such as evaluating labor force efficiency, optimal use of labor time, and defining operational sequences in the modern economy.

While labor was previously considered only as a technical element of the production process, it is now evaluated as a source of management and economic benefit. Economic development is directly linked to the proper standardization of labor, which helps ensure accuracy and

efficiency in work processes. Nowadays, work performance must be evaluated not only based on the quality of execution but also on the normative workload, labor productivity, and operational standards.

Research on economic reforms and ensuring competitiveness in production is increasing the demand for scientifically-based, systematic approaches to organizing labor activities in enterprises. Effective use of production capacities, improving labor productivity, ensuring continuity in production processes, and saving time resources are becoming strategically important for modern enterprises. In particular, improving the labor standardization system plays a fundamental role in the management and effectiveness of these processes.

The theoretical foundations of this system have developed in various stages and are reflected in the scientific research of international economic schools, CIS researchers, and Uzbek scholars (Table 1.1).

1.1-table.

Historical-Evolutionary Stages of the Concept of Labor Standardization[1]

Stage	Approach Representatives	Key Results
Early Theoretical Foundations Period (Late 18th Century – Early 19th Century)	Adam Smith (1776), Charles Babbage, Robert Owen, and others	Ideas on organizing production efficiently through labor division and increasing productivity were formed.
Scientific Management and Standardization Period (Late 19th Century – Early 20th Century)	F. Taylor (1911), G. Emerson (1913), G. Gantt, and others	Scientific measurement of labor actions, development of standard operations and time norms were established.
Socialist Standardization and Technological Analysis (Mid 20th Century)	V.M. Smirnov (1983), T.A. Kovalchuk (1990), A.S. Lapin (1989), and others	Labor standards became part of production planning, and norms were developed based on technological processes.
Flexible Approach in Market Economy Conditions (Late 20th Century – Early 21st Century)	E.D. Sirenova, S.A. Dyatlov, A.I. Dobrynin, and others	Economic motivation, employment efficiency, and production cost calculation became the main directions in labor standardization.
Digital Transformation and Sector Integration Stage (Since the 21st Century)	M.N. Tursunov (2021), D.I. Soliyev (2020), G.G‘. Karimova (2019), and others	Automation of labor standards based on digital technologies and aligning actual and planned workload became a priority.

The classical economist Adam Smith, in his scientific works, explained that “The division of labor is the primary factor in increasing productivity, through which each worker performs their function perfectly,” thus justifying the role of labor division in enhancing efficiency.

Later, the founder of scientific management, F. Taylor, emphasized the importance of measuring and standardizing labor actions in achieving production efficiency, stating: “Every labor action should be thoroughly studied, analyzed, and regulated through effective standards.” In this regard, according to the principles proposed by G. Emerson, “Labor standardization is a crucial tool for increasing resource use efficiency, preventing unnecessary costs, and improving production quality.”

In the experience of the CIS countries, these approaches have been deeply implemented in practical planning and the activities of production organizations. For example, Russian economist V.M. Smirnov interpreted labor standardization as a “coordinating mechanism in the

[1] Author's Work

management of production processes" and believed that "technological flow can be optimized based on clear standards." T.A. Kovalchuk wrote that "Labor standards are a planning tool that justifies the technological sequence of production." A.S. Lapin, in the context of digitized production conditions, proposed that "Through labor standardization, the accuracy of the production process, the optimal limit of processing time, and the prevention of errors are achieved."

Uzbek economist M. Tursunov, while analyzing labor standardization issues in manufacturing enterprises, emphasized that "In order to regulate the production process, clarity must be added to each operation, and labor standards must be established based on these operations." Additionally, G'. Karimova defines labor standardization as "an economic mechanism that prevents delays, uncertainties, and excessive time expenditure in the production process." D. Soliyev also considers that "Implementing labor standards in enterprises is a key factor in increasing labor productivity and synchronizing production processes."

Conclusions and Recommendations

Small enterprises producing sewing and knitted products are an important segment of modern light industry, playing a significant role in economic growth, increasing employment, and ensuring social stability. The effective use of labor resources in these enterprises, especially the proper implementation of the labor standardization system, directly affects the overall efficiency of the enterprise's operations. Based on the results of the research, the following key conclusions were made:

- Labor standardization is a scientifically based management tool for normalizing production processes, and it is a key factor in increasing labor productivity and the rational use of resources in small enterprises.
- In most small sewing and knitted enterprises, the labor standardization system is not based on modern approaches, leading to inefficiency in production processes and resource waste.
- The standardization system not only requires setting time norms but also involves organizing workspaces, optimizing technological sequences, and aligning motivational systems.
- Statistical analysis shows that small enterprises that correctly implement labor standardization have lower production costs, improved product quality, and higher worker satisfaction levels.

Based on the research results, the following recommendations were made:

1. A separate methodological guide on labor standardization should be developed and implemented in small sewing and knitted enterprises. This guide should systematize the normative standards used on various sewing and knitting machines.
2. Special professional development courses on labor standardization should be organized to strengthen the knowledge of small business leaders and production department heads in this area.
3. It is recommended to introduce operational analysis and real-time monitoring in the standardization system through the use of digitalization and automation technologies (e.g., RFID, IoT, ERP).
4. An internal control system should be implemented in every small enterprise to regularly calculate the key performance indicators of labor productivity (KPInorm, TEEnorm).
5. Scientific research institutes and higher education institutions should support the development of practical, tailored labor standardization models for small sewing and knitted enterprises.
6. If the government implements programs for the training and support of specialists specializing in labor standardization, this will contribute to the professional development of the sector.

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Linguistic-Cultural Approach To The Analysis Of The Functionality Of Ideonyms

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Abstract
This article analyzes the functionality of ideonyms through a linguocultural approach. Naming units such as biblionyms, artionyms, chrononyms, theonyms, and mythonyms are examined as linguocultural elements reflecting the cultural, historical, and social consciousness of a people. The study highlights the nominative, identification, cultural-symbolic, and communicative functions of ideonyms, emphasizing their role in conveying cultural concepts through language.
Keywords: Ideonyms, linguocultural approach, language and culture, functionality, identification, cultural code, nomination, national spirituality, historical memory, linguistics.

Annotatsiya
Ushbu maqolada ideonimlarning lingvomadaniy yondashuv asosida funksionalligi tahlil qilinadi. Biblionim, artionim, xrononim, teonim, mifonim kabi nomlash birliklari xalqning madaniy, tarixiy va ijtimoiy ongini ifodalovchi lingvokulturologik vositalar sifatida qaraladi. Lingvokulturologiya doirasida ideonimlarning nominativ, identifikatsion, madaniy-ramziy va kommunikativ funksiyalari yoritiladi hamda ularning til orqali madaniyatni aks ettirishdagi o‘rni ochib beriladi.
Kalit so’zlar: Ideonimlar, lingvomadaniy yondashuv, til va madaniyat, funksionallik, identifikatsiya, madaniy kod, nominatsiya, xalq ma’naviyati, tarixiy xotira, tilshunoslik.

Ideonimlar – biblionim (badiiy, ilmiy, ommabop asarlar nomlari), artionim (san’atning barcha turlaridagi nomlar), xrononim (tarixiy voqealar, tarixiy davrlar nomlari), teonim (payg‘ambarlar, avliyolar, farishtalar, masjid va ehromlar), mifonim **(**afsonalar, ertaklar, rivoyatlarning nomlari, xalq og‘zaki ijodida uchraydigan nomlar), gyeortonimlar (bayramlar, tantana va festivallar nomlari) va boshqa nom turlari – tilning muhim qatlami biri bo‘lib, ular nafaqat ob’yektlarni aniqlash vositasi, balki xalqning madaniy, tarixiy va ijtimoiy dunyoqarashini aks ettiruvchi muhim lingvomadaniy birliklardir. Lingvokulturologiya til va madaniyatning o‘zaro bog‘liqligini o‘rganuvchi fan sifatida ideonimlarning funksionalligini tahlil qilishda muhim yondashuv hisoblanadi.
Lingvokulturologiya – tilshunoslik va madaniyatshunoslik kesimidagi fan bo‘lib, u xalq madaniyati paydo bo‘lishining tilda ifodalanishi va mujassamlanishini tadqiq etadi. Bu ikki yo‘nalish, ya’ni tilshunoslik va madaniyatshunoslik o‘zaro bog‘lanishi oddiy bog‘lanish emas, balki bu yangi ilmiy asoslangan yo‘nalishning vujudga kelishidir. Shuning uchun bu hodisa tilshunoslik va madaniyatshunoslikning vaqtincha bog‘lanishi bo‘lmasdan, u fanning sistemalashgan tarmog‘i bo‘lib o‘zining mustaqil maqsad, vazifa, metod va tadqiqot ob’yektiga ega bo‘lgan fandir.[1] O‘zbek tilidagi ideonimlar lingvomadaniy nuqtai nazardan xalqning ma’naviy merosi, milliy o‘zligi va global ta’sirlar bilan uyg‘unligini o‘zida aks ettiradi.
Lingvokulturologiya til birliklarini madaniy kontekstda o‘rganadi va ularning jamiyatdagi ijtimoiy, ma’naviy va ramziy vazifalarini tahlil qiladi. Ideonimlarning funksionalligi quyidagi asosiy jihatlarni o‘z ichiga oladi:
Nominativ funksiya: ob’yektlarni (tarixiy, dinga oid asar, shaxs, samoviy joy, xalq og‘zaki ijodidagi atoqli ot, asar nomlari va boshqalar) aniqlash va farqlash.
Identifikatsiya funksiyasi: milliy, diniy yoki ijtimoiy o‘zlikni ifodalash.
Madaniy-ramziy funksiya: xalqning tarixiy xotirasi, qadriyatlar tizimi va dunyoqarashini aks ettirish.

Kommunikativ funksiya: ijtimoiy aloqa vositasi sifatida xizmat qilish.[2]

Madaniy ma’no tashuvchisi sifatida ideonimlar muhim ahamiyatga ega. Ideonimlar xalqning dunyoqarashi, qadriyatlar tizimi va hayot tarzi haqida ma’lumot beradi. Masalan, o‘zbek tilidagi “mehmonnavozlik” so‘zi odam nafaqat mehmonni kutib oladi, balki o‘zbek xalqining saxovatini va mehmondo‘stligini aks ettiradi degan ma’noni ifodalaydi. Lingvokulturologiya til va madaniyat integratsiyasi orqali bu so‘zlarning madaniy kontekstini tahlil qiladi. Demak, ideonimlar til orqali madaniy identifikatsiyani ta’minlaydi.

Shuningdek, Lingvokulturologiya ma’lum bir xalqning mentaliteti shakllanishi va avloddan-avlodga saqlanib o‘tishiga ta’sir etadigan omillarni o‘rganadi. Lingvokulturologik yondashuvda ideonimlarning funksionalligi doirasida til nafaqat moddiy kommunikativ vosita sifatida, balki madaniy va identifikatsiya tashuvchisi sifatida ham o‘rganiladi. Ideonimlar til va madaniyat o‘rtasida o‘ziga xos ko‘prik bo‘lib, xalqning dunyoqarashini yuksaltirishda muhim ahamiyatga ega. Lingvomadaniy yondashuv ideonimlarni nafaqat til birligi, balki madaniy kod sifatida ko‘rib, ularning jamiyatdagi o‘rnini chuqur tahlil qiladi. Taniqli lingvokulturolog V.Vorobyovning so‘zlariga ko‘ra: “Til madaniyatning oynasi bo‘lib, undagi har bir birlik xalqning ma’naviy olamini ochib beradi” [3]

O‘zbek tilidagi ideonimlar turkiy, arabiy, forsiy va boshqa madaniyatlarning ta’sirida shakllangan bo‘lib, ularning funksionalligi lingvomadaniy kontekstda xalqning o‘tmishi va bugunini bog‘laydi.

Lingvokulturologiyaning markazi madaniyat fenomenidan iborat bo‘lishi inson haqidagi fanning antropologik paradigmaga tegishli hodisa ekanligidan dalolat beradi” [4]

Matndagi fikr madaniyat fenomeniga e’tibor qaratishi uni ideonim nuqtai nazaridan insonning madaniy dunyoqarashini ifoda etuvchi til birliklari bilan bog‘laydi. Ideonimlar til orqali madaniyatning muhim konseptlarini ochib beradi, lingvokulturologiya esa bu konseptlarning tilda qanday shakllanayotganini tahlil qiladi. Shu tariqa, til va madaniyat inson faoliyatining mahsuli sifatida o‘zaro bog‘lanadi, ya’ni ideonimlar til orqali inson madaniyatining chuqur ma’nolarini ochib beradi.

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Management Of Labor Standardization System Assessment Processes In Small Business Enterprises

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Abstract
This scientific work analyzes the main structural elements of the labor standardization system in small enterprises and their functional significance. Modern mechanisms of labor standardization, standards of time, service, volume of work in production processes, organization of the workplace, and normative bases of labor actions are determined. The study studies methods for assessing the effectiveness of the standardization system - expert assessment, index of indicators, technological time analysis and evaluation mechanisms based on complex labor efficiency indicators.
Keywords: small enterprise, labor standardization, time standard, service standard, volume of work, evaluation methods, production efficiency, regulatory system, production process, organization of the workplace.

Annotatsiya
Mazkur ilmiy ishda kichik korxonalarda mehnatni me’yorlashtirish tizimining asosiy tarkibiy elementlari va ularning funksional ahamiyati tahlil qilinadi. Mehnatni me’yorlashtirishning zamonaviy mexanizmlari, ishlab chiqarish jarayonlarida vaqt, xizmat ko‘rsatish, ish hajmi me’yorlari, ish joyini tashkil etish, hamda mehnat harakatlarining normativ asoslari aniqlanadi. Tadqiqotda me’yorlashtirish tizimi samaradorligini baholovchi usullar – ekspert bahosi, ko‘rsatkichlar indeksi, texnologik vaqt tahlili va kompleks mehnat samaradorligi ko‘rsatkichlari asosida baholash mexanizmlari o‘rganilgan.
Kalit so‘zlar: kichik korxona, mehnatni me’yorlashtirish, vaqt me’yori, xizmat me’yori, ish hajmi, baholash usullari, ishlab chiqarish samaradorligi, normativ tizim, ishlab chiqarish jarayoni, ish joyini tashkil etish.

Kirish

Bugungi raqobatbardosh iqtisodiy muhitda kichik ishlab chiqarish korxonalari o‘z faoliyatining samaradorligini oshirish uchun resurslardan oqilona va ilmiy asosda foydalanishni talab qilmoqda. Xususan, mehnatni me’yorlashtirish tizimi bu jarayonda markaziy o‘ringa ega bo‘lib, u korxonadagi barcha mehnat jarayonlarini standartlashtirish va unumdorlikni oshirish imkonini beradi.

Kichik korxonalarda mehnatni me’yorlashtirishning o‘ziga xos jihati shundaki, bu subyektlar ko‘pincha cheklangan moddiy va mehnat resurslari sharoitida faoliyat yuritadi. Shu bois mehnatni ilmiy asosda rejalashtirish va me’yorlashtirish ularning barqaror faoliyat yuritishida hal qiluvchi ahamiyatga ega.

Mazkur tadqiqotda mehnatni me’yorlashtirish tizimining asosiy elementlari – vaqt me’yorlari, xizmat ko‘rsatish me’yorlari, ish hajmi me’yorlari, ish joyini tashkil etish, texnologik harakatlar ketma-ketligi va boshqa tarkibiy qismlar alohida ko‘rib chiqiladi. Shuningdek, tizimning samaradorligini baholashda qo‘llaniladigan zamonaviy indikatorlar va tahliliy usullar tahlil qilinadi.

Mehnatni me’yorlashtirishning ilmiy asoslari XX asrning o‘rtalaridan boshlab jadal rivojlanib, ishlab chiqarish nazariyasida mehnat harakatlarining sifati, izchilligi va iqtisodiy samaradorligini tahlil qilishga yo‘naltirildi. Bu nazariya zamonaviy iqtisodiyotda ishchi kuchi samaradorligini baholash, mehnat vaqtining optimal sarflanishi, operatsion ketma-ketliklarni belgilash kabi masalalarga yechim izlaydi.

Mehnatni me’yorlashtirish konsepsiyasining tarixiy-evolyutsion rivojlanish bosqichlari tahlili shuni ko‘rsatadiki, bu tizim dastlab nazariy g‘oya sifatida shakllangan bo‘lsa, keyinchalik ishlab chiqarish jarayonlarini rejalashtirish, resurslardan samarali foydalanish va umumiy samaradorlikni oshirishning muhim boshqaruv vositasiga aylangan. Mazkur tizim ayniqsa, zamonaviy ishlab chiqarish sharoitlarida raqamli texnologiyalar bilan uyg‘unlashib, ish vaqtining aniq me’yorlanishi, texnologik yuklama va bandlikka asoslangan nazorat mexanizmiga aylandi. Bu jarayonlar bevosita mehnat unumdorligi ko‘rsatkichi bilan uzviy bog‘liqdir. Mehnat unumdorligi ishlab chiqarish samaradorligini belgilovchi asosiy mezonlardan biri bo‘lib, bevosita mehnatni me’yorlashtirish darajasiga ta’sir ko‘rsatadi. Chunki me’yorlashtirish orqali har bir mehnat harakati, texnologik operatsiya va ishchi faoliyati optimallashtiriladi, resurslardan oqilona foydalanish va vaqt isrofiga yo‘l qo‘ymaslik ta’minlanadi.

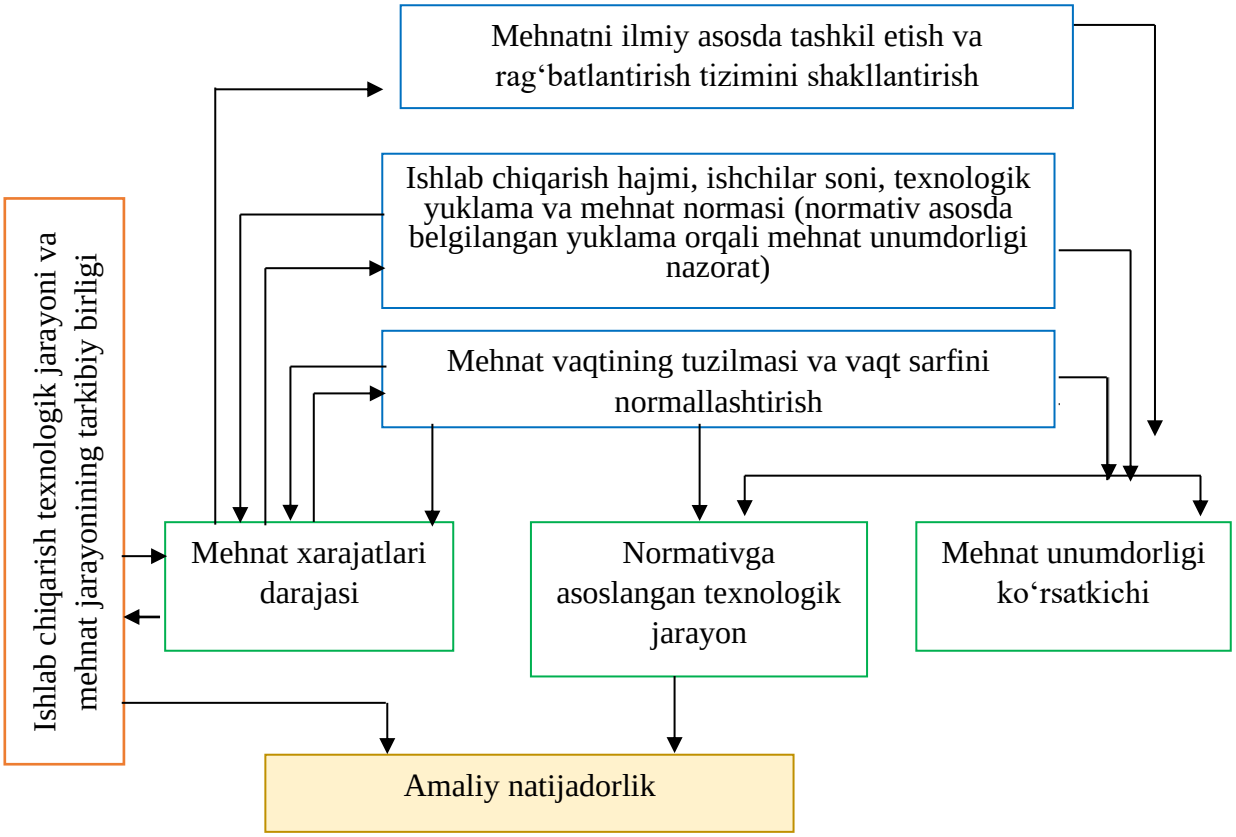
Mehnatni me’yorlashtirish va mehnat unumdorligi o‘rtasidagi o‘zaro munosabat quyidagi ko‘rinishda namoyon bo‘ladi:

- mehnatni me’yorlashtirish me’yorlar asosida ish hajmini aniqlaydi, bu esa har bir ishchiga nisbatan real yuklama va ish vaqti ko‘rsatkichlarini belgilaydi;
- me’yorlar asosida shakllangan operatsion rejimlar orqali mehnat intizomi va texnologik izchillik ta’minlanadi;
- normativ yondashuv orqali ishlab chiqarish jarayonida ishchilarning ortiqcha bandligi yoki bo‘sh turgan vaqtlar bartaraf etiladi.

Natijada umumiy ishlab chiqarish samaradorligi oshadi va mehnat unumdorligi izchil o‘sishga erishadi. Mazkur o‘zaro bog‘liqlik ikki yo‘nalishda harakatlanuvchi tizimli aloqani tashkil etadi. Ya’ni, yuqoridan – ya’ni normativ boshqaruv orqali mehnat jarayoni tartibga solinadi, pastdan esa – real mehnat samaradorligi ko‘rsatkichlari asosida me’yorlar takomillashtiriladi. Bunday yondashuv nafaqat ishlab chiqarish samaradorligini oshiradi, balki mehnatga haq to‘lash, rag‘batlantirish, malaka oshirish va boshqaruvning boshqa tizimlari uchun ham ishonchli asos yaratadi.

Ushbu sxema mehnatni me’yorlashtirish tizimining ishlab chiqarish samaradorligiga ta’sirini ko‘rsatish bilan birga, mehnat unumdorligini shakllantiruvchi asosiy omillarni ketma-ket va bosqichma-bosqich izohlaydi(1.1-rasm). Sxema markazida ishlab chiqarish texnologik jarayoni va mehnat jarayonining o‘zaro uzviy bog‘liqligi yotadi. Aynan shu birlashgan tizim doirasida mehnatni me’yorlashtirishning barcha tarkibiy jihatlari shakllanadi va natijadorlikka olib keluvchi zanjirli ta’sirlar yuzaga chiqadi.

Mehnatni me’yorlashtirishning ilk bosqichi mehnat jarayonini ilmiy tashkil etish va xodimlarni adolatli rag‘batlantirish tizimini shakllantirish bilan bog‘liq bo‘lib, bunda mehnat hajmi, sifati va miqdori asosida mehnatga haq to‘lash me’yorlari belgilanadi. Bu esa xodim faoliyatiga nisbatan ob’yektiv baholash imkonini yaratadi.



1.1-rasm. Mehnatni me’yorlashtirish va mehnat unumdorligi o‘rtasidagi o‘zaro bog‘liqlik sxemasi

Kichik ishlab chiqarish korxonalarida mehnatni me’yorlashtirish tizimi, odatda, ishlab chiqarishning ichki resurslaridan oqilona foydalanishni ta’minlash, samaradorlikni oshirish va xarajatlarni boshqarish mexanizmi sifatida qaraladi. Ushbu tizimni samarali boshqarish va takomillashtirish uchun uni muntazam ravishda baholab borish zarur. Baholash natijalari asosida normativ-huquqiy bazani qayta ko‘rib chiqish, texnologik xaritalarni yangilash, yoki me’yorlashtirish metodikasini zamonaviylashtirish mumkin.

Kichik ishlab chiqarish korxonalarida mehnatni me’yorlashtirish tizimini baholashning asosiy maqsadlari:

- mehnat me’yorlarining mavjud ishlab chiqarish sharoitlariga moslik darajasini aniqlash;
- me’yorlar bajarilishi samaradorligini aniqlash orqali ishchilarning ish yuklamasini obyektiv baholash;
- texnik asoslangan me’yorlar ulushi va me’yorlashtirish jarayonining qamrov darajasini aniqlash;
- mehnat intizomi, ijro sifati va ishlab chiqarish sig‘imining me’yorlashtirishga ta’sirini o‘rganish;
- ishchilarning me’yorlarga nisbatan subyektiv munosabatini o‘rganish orqali tizimdagi noaniqliklarni aniqlash.

Mazkur baholash faoliyatida asosiy vazifa — me’yorlarning ishlab chiqarish sharoitlariga texnik jihatdan mosligi, bajarilishi, qamrovi, asoslanganligi va qabul qilinishi darajasini aniqlashdir. Ushbu yondashuv mehnat me’yorlarini oddiy tartibga solish vositasi sifatida emas, balki ishlab chiqarish tizimining muhim strategik elementi sifatida ko‘rishga xizmat qiladi. Aynan shu nuqtai nazardan kelib chiqib, mehnatni me’yorlashtirish tizimini baholashda kompleks, ko‘p mezonlarga asoslangan baholash usullari zarur bo‘ladi. Quyida ushbu tizimni baholashda qo‘llaniladigan asosiy usullar yoritib beriladi:

1. Normativ-moslik tahlil usuli. Bu usul mehnat me’yorlarining mavjud ishlab chiqarish sharoitlariga texnik va texnologik jihatdan mos kelish darajasini aniqlashda qo‘llaniladi. Me’yorlar zamonaviy uskuna, texnologik xarita, texnologik intizom va real ish yuklamasi bilan

mutanosib bo‘lishi shart. Ekspert baholash asosida amalga oshiriladi hamda har bir me’yor alohida ko‘rib chiqilib, 0 dan 3 gacha ball qo‘yiladi. Formulasi:

$$A_m = \frac{\sum_{i=1}^{n} Bi}{3n} \times 100\% \qquad (1.2.1)$$

Bu yerda: A_m - normativ-moslik koeffitsiyenti (%)
B_i – har bir me’yor bo‘yicha ball,
n – baholangan me’yorlar soni.

Kichik ishlab chiqarish korxonalarida mehnatni me’yorlashtirish tizimini takomillashtirishda tizimga tegishli har bir funksional elementni chuqur tahlil qilish, ularning o‘zaro bog‘liqligini aniqlash va real ishlab chiqarish jarayonlari bilan uyg‘unligini baholash talab etiladi. Ushbu baholash usullari mehnatni me’yorlashtirish tizimining ichki mustahkamligi, adolatliligi, qamrovi va texnik asoslanganlik darajasini kompleks tarzda aniqlashga xizmat qiladi. Har bir usul o‘ziga xos tahliliy yondashuvga ega bo‘lib, ishlab chiqarish jarayonlarida yuzaga kelayotgan ziddiyatli yoki nomutanosib holatlarni erta bosqichda aniqlash imkonini beradi.

Har bir baholash usuli o‘ziga xos yondashuvga ega bo‘lib, ishlab chiqarishdagi beqarorlik, ziddiyatli operatsiyalar, mehnat yuklamasidagi nomutanosibliklar, vaqt va resurslarning samarasiz sarfi kabi holatlarni erta bosqichda aniqlash imkonini beradi. Bu jihatdan baholash vositalari tizimda yuzaga kelayotgan muammolarni “kechki reaksiya” emas, balki oldindan ogohlantiruvchi mexanizm sifatida talqin qilinadi. Ayniqsa kichik korxonalarda inson resurslari va texnik imkoniyatlar cheklangan sharoitda, me’yorlashtirish tizimining zaif jihatlarini aniqlash orqali samaradorlikni oshirish muhim amaliy vazifaga aylanadi.

Xulosa va takliflar

Tadqiqot natijalariga ko‘ra quyidagi muhim xulosalar chiqarildi:

1. Kichik korxonalarda mehnatni me’yorlashtirish tizimi kompleks yondashuv asosida shakllanishi kerak, ya’ni nafaqat vaqt me’yorlarini belgilash, balki xizmat ko‘rsatish, texnologik jarayonlar ketma-ketligi va ish joyi ergonomikasini ham qamrab olishi lozim.
2. Tizimning tarkibiy elementlari quyidagilar hisoblanadi:
- Vaqt me’yori (tayyorlov-vaqt, asosiy operatsion vaqt, texnologik vaqt)
- Xizmat me’yori (ustaxona, mashina yoki xodimga xizmat ko‘rsatish normasi)
- Ish hajmi me’yori (ishlab chiqariladigan mahsulot birligi bo‘yicha)
- Ish joyining me’yoriy tashkil etilishi
- Ish harakatlarining normativ ketma-ketligi
3. Baholash usullari sifatida quyidagilar ajralib turadi:
- Ekspert baholash va ball usuli
- Ishlab chiqarish samaradorligi ko‘rsatkichlari tahlili (TPI, TEE, KPInorm)
- Texnologik harakatlar asosida vaqtda hisoblangan ko‘rsatkichlar
- Mehnat xarajatlari indeksi asosidagi taqqoslashlar

Tadqiqot natijalariga ko‘ra quyidagi takliflar berildi:

TAKLIFLAR

1. Kichik korxonalar uchun moslashtirilgan me’yorlashtirish tizimi moduli ishlab chiqilishi va ishlab chiqarish jarayoniga joriy etilishi lozim.
2. Raqamli platformalarga asoslangan me’yorlashtirish dasturlari (masalan, ERP tizimlar ichida mehnat me’yorlari moduli) kichik korxonalar uchun moslashtirilib joriy etilishi zarur.
3. Amaliy o‘quv dasturlari orqali ishlab chiqarish boshliqlari, ustalar va texnologlar uchun me’yorlashtirish bo‘yicha malaka oshirish kurslari tashkil etilishi kerak.
4. Har bir kichik korxonada mehnat samaradorligi indikatorlarini muntazam tahlil qiluvchi oddiy modellar (masalan, normativ koeffitsiyentlar) joriy etilishi taklif etiladi.
5. Davlat tomonidan kichik korxonalar uchun mehnatni me’yorlashtirishga oid metodik qo‘llanmalar, namunaviy jadval va ko‘rsatkichlar to‘plami ishlab chiqilishi va bepul tarqatilishi zarur.

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Endocrine Diseases: Types, Causes And Treatment Methods

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Abstract
This article comprehensively reviews human endocrine diseases, their causes, clinical manifestations, diagnostic methods, and modern treatment strategies. Preventive measures and epidemiological data are also included.
Keywords: Endocrine system, hormones, diabetes, thyroid gland, adrenal glands, pituitary gland, insulin, metabolic syndrome, prevention, modern treatment.

Annotatsiya
Mazkur maqolada inson organizmida endokrin tizim kasalliklarining roli, ularning asosiy turlari, sabablari, klinik belgilari, tashxis qo‘yish usullari va davolash yo‘llari haqida batafsil ma'lumot beriladi. Shuningdek, zamonaviy davolash va profilaktika usullari, kasalliklarning jamiyatdagi tarqalishi, statistik ma'lumotlar asosida yoritilgan.
Kalit so‘zlar: Endokrin tizim, gormonlar, qandli diabet, qalqonsimon bez, buyrak usti bezlari, gipofiz, insulin, metabolik sindrom, profilaktika, zamonaviy davolash.

KIRISH

Endokrin tizim inson organizmining asosiy boshqaruv tizimlaridan biridir. U ichki sekretsiya bezlari orqali gormonlar ishlab chiqarib, modda almashinuvini, o‘sish va rivojlanishni, stressga javob reaksiyalarini va reproduktiv funksiyalarni nazorat qiladi.

Endokrin kasalliklarning ahamiyati:

- Har bir beshinchi inson endokrin tizim bilan bog‘liq kasalliklardan aziyat chekadi.
- O‘zbekistonda qandli diabet va qalqonsimon bez kasalliklari keng tarqalgan.
- Erta tashxis qo‘yilmasa, bu kasalliklar hayot sifati va umr davomiyligini qisqartiradi.

ASOSIY QISM

1. QANDLI DIABET

Ta'rifi:

Qandli diabet — bu glyukoza almashinuvi buzilishi bilan kechadigan, insulin yetishmovchiligi yoki insulinga qarshilik tufayli yuzaga keladigan surunkali kasallikdir.

Turlari:

Diabet turi	Sababi	Davolash
1-tip	Autoimmun jarayon (beta hujayralarning parchalanishi)	Insulin terapiyasi
2-tip	Insulin qarshiligi, semizlik, harakatsizlik	Parhez, OGTT, metformin, GLP-1 agonistlari
Gestatsion diabet	Homiladorlik paytida gormonal o‘zgarishlar	Parhez, insulin

Klinik belgilari:

- Chanqash
- Tez-tez siyish
- Vazn yo‘qotish
- Holsizlik
- Yaralarning kech bitishi

Zamonaviy davolash usullari:

- **CGM (Continuous Glucose Monitoring)** – doimiy qand nazorati
- **Insulin pompasi** – 1-tip diabetda qulay usul
- **Dori vositalari yangilanishi**: SGLT2 inhibitorlari, GLP-1 agonistlari

Profilaktika:

- Sog‘lom ovqatlanish
- Harakatlilikni oshirish
- Ortiqcha vaznni nazorat qilish

2. QALQONSIMON BEZ KASALLIKLARI

Gipotiroidizm:

- **Sababi**: Autoimmun tireoidit (Xashimoto kasalligi), yod yetishmovchiligi
- **Belgilari**: Sovuqqa chidamsizlik, sekin yurak urishi, semirish, quruq teri
- **Davolash**: Levotiroksin (T4 gormon)

Gipertiroidizm:

- **Sababi**: Basedov kasalligi (Graves), tugunli toksik guatr
- **Belgilari**: Tez yurak urishi, ozib ketish, asabiylik, ko‘zlarning o‘zgarishi
- **Davolash**: Metimazol, radioaktiv yod, jarrohlik

Yod yetishmovchiligi va endemik buqoq:

- O‘zbekistonning ayrim hududlarida keng tarqalgan
- **Oldini olish**: Yodlangan tuz ishlatish, ommaviy profilaktika dasturlari

3. BUYRAK USTI BEZLARI KASALLIKLARI

Kasallik	Sabab	Klinik belgilar	Davolash
Kuşing sindromi	Kortizol ortiqligi	Semirish, gipertoniya, to‘q qizil chandiqlar	Jarrohlik yoki dori vositalari
Addison kasalligi	Kortizol yetishmovchiligi	Hipotoniya, quyuq pigmentatsiya, holsizlik	Gormonlar o‘rnini bosish terapiyasi

4. POLIKISTIK TUQUMDON SINDROMI (PCOS)

Xususiyatlari:

- Ayollarda keng tarqalgan
- Gormonal buzilish
- Hayz siklining buzilishi
- Tuklanish, akne, bepushtlik

Davolash:

- Ovqatlanishni nazorat qilish, vazn kamaytirish
- Metformin
- Kontratseptiv dori vositalari

5. GIGANTIZM VA AKROMEGALIYA

Ta'rifi:

- **Gigantizm**: bolalikda o‘sish gormoni ortiqligi
- **Akromegaliya**: kattalarda o‘sish gormoni ko‘payishi

Belgilari:

- Qo‘l-oyoqlarning kattalashishi
- Yuz tuzilishining o‘zgarishi
- Yurak-qon tomir muammolari

Davolash:

- Gipofiz o‘smasini olib tashlash (jarrohlik)
- Dopamin agonistlari, somatostatin analoglari

6. METABOLIK SINDROM

Xususiyatlari:

- Qorin qismida semizlik

- Gipertoniya
- Insulin qarshiligi
- Dislipidemiya

Oldini olish:

- Ratsional ovqatlanish
- Harakatchanlik
- Vaznni nazorat qilish

PROFILAKTIKA BO‘YICHA JADVAL

Profilaktika yo‘li	Amalga oshirish
Sog‘lom ovqatlanish	Tuzni kamaytirish, shakarni cheklash, sabzavot-mevalar iste'moli
Jismoniy faollik	Haftasiga kamida 150 daqiqa o‘rtacha jismoniy mashq
Yodli tuz ishlatish	Qalqonsimon bez kasalliklarining oldini olish
Muntazam ko‘rik	Har yili endokrinologga murojaat qilish

XULOSA

Endokrin kasalliklar inson salomatligining muhim muammolaridan biri bo‘lib, ular ko‘plab hayotiy a'zolar faoliyatiga ta'sir ko‘rsatadi. Erta tashxis va zamonaviy davolash usullari kasalliklar oqibatlarini kamaytiradi. Sog‘lom turmush tarzi va profilaktika choralari esa kasalliklar rivojlanishining oldini olishda asosiy omillardir.

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WHO Diabetes Factsheet, 2024
American Thyroid Association Clinical Guidelines, 2023
Endocrine Society Clinical Practice Guidelines, 2024
Harrison's Internal Medicine, 21st Edition
O‘zbekiston Respublikasi Sog‘liqni Saqlash Vazirligi, Endokrinologiya markazi ma'lumotnomasi, 2023

Studying the Effectiveness and Prospects of Virtual and Augmented Reality Technologies in Education

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Abstract
This thesis examines the effectiveness, practical applications, and challenges of virtual reality (VR) and augmented reality (AR) technologies in educational processes. Based on both international and local experiences (such as those of universities in Kazakhstan, Uzbekistan, and the United States), the study analyzes the role of these technologies in enhancing student motivation, knowledge retention, and the development of practical skills. The methodology involves literature analysis, meta-analyses, experimental research findings, and the evaluation of local case studies.
Keywords: Virtual Reality (VR), Augmented Reality (AR), Immersive Learning, Educational Effectiveness, Knowledge Retention, Motivation.

In recent years, VR and AR technologies have been widely integrated into the field of education. According to studies conducted by PwC, Deloitte, and other organizations, VR enables students to experience 3.75 times stronger “emotional engagement,” which helps improve long-term knowledge retention. Additionally, at both K-12 and higher education levels, these technologies have been shown to significantly enhance student motivation, engagement, and academic performance.

Current global trends demonstrate the rapid adoption of VR (virtual reality) and AR (augmented reality) technologies in the education sector. International experience and scientific sources have confirmed that these technologies significantly improve the effectiveness of teaching. For example, according to a study conducted by PwC in 2023, students trained with VR acquired knowledge four times faster and developed practical skills 275% more effectively compared to students taught through traditional methods. Similarly, leading universities in the United States, including Harvard and Stanford, emphasize that learning through VR increases students' attention span and enhances their motivation for independent learning. Since 2023, Meta has launched a project to introduce virtual classrooms at 15 universities across the United States through a $150 million fund, providing more than 300 Meta Quest 2 devices as part of the initiative.

In the field of medicine, VR and AR technologies have been among the most widely tested and have demonstrated the highest levels of effectiveness. According to a meta-analysis published in the international journal *Medical Education*, students who practiced surgical procedures using VR showed statistically significant improvements in test results, with a p-value of less than 0.001, indicating a very high level of reliability. Students who studied using AR-based 3D anatomical models achieved 30–40% higher knowledge retention compared to those taught through traditional methods. Moreover, during the pandemic, the use of AR and VR tools in distance education was evaluated positively, especially in creating immersive environments for students who lacked access to practical training.

Initial implementation results of these technologies in Uzbekistan and neighboring Central Asian countries are also noteworthy. For instance, at Tashkent University of Information Technologies (TUIT), a VR laboratory was established to conduct practical lessons in cybersecurity, where students’ knowledge retention improved by 25%. Similarly, at Nazarbayev University in Kazakhstan, a pilot project using AR for foreign language learning was implemented, resulting in an 18% improvement in pronunciation accuracy.

These technologies are also being tested in school education. According to a 2022 study conducted in the Rajasthan state of India, students who studied physics and chemistry using AR applications demonstrated 32% better outcomes in connecting theoretical knowledge with practical applications. In Estonia, AR technologies have been introduced in all general education schools, where improvements have been observed in both educational effectiveness and student attendance rates.

At the same time, there are certain challenges associated with AR and VR technologies. High initial costs, low levels of technical preparedness among some teachers, classroom management complexities, and the risk of these technologies becoming overly game-like and distracting from core learning objectives are considered significant issues. Specifically, Deloitte's 2023 report titled "VR/AR in Education" revealed that 46% of teachers reported not having sufficient training to effectively use these technologies in their teaching practices.

Nevertheless, overall conclusions indicate that VR and AR technologies hold clear potential for improving the quality of education. Their pedagogical value and positive impact on student motivation have been consistently supported by credible scientific evidence.

Conclusion

VR and AR technologies have been proven to enhance motivation and knowledge retention in the field of education. These tools provide effective practical experiences in areas such as medicine, language learning, K-12 education, and higher education. However, for successful implementation, it is crucial to ensure proper technical infrastructure, teacher training, and cost reduction. In the context of Uzbek schools and universities, a multimodal approach—combining online learning, practical exercises, and VR/AR integration—is likely to be the most effective strategy.

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Methodological Approaches To The Development Of Students' Perceptual Abilities In Primary Education

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Abstract
This article explores methodological approaches to developing perceptual abilities in primary school students. It analyzes effective strategies for enhancing skills related to sensory information processing, analysis, and integration with prior knowledge. The study emphasizes the use of interactive technologies, self-assessment practices, and collaborative activities to foster perceptual growth, which in turn improves students' creativity, engagement, and communication competencies.
Keywords: perceptual ability, primary education, methodological approach, interactive technologies, self-assessment, creative thinking.

Annotatsiya
Ushbu maqolada boshlang‘ich sinf o‘quvchilarining perseptiv (idrok etish) qobiliyatlarini rivojlantirishga xizmat qiluvchi metodik yondoshuvlar yoritilgan. Ta’lim jarayonida sezgi organlari orqali ma’lumotni qabul qilish, uni tahlil qilish va shaxsiy tajriba bilan bog‘lay olish ko‘nikmalarini shakllantirish uchun samarali usullar, interaktiv texnologiyalar va o‘z-o‘zini baholash mashqlari tahlil qilingan. Perseptiv qobiliyatni rivojlantirish o‘quvchilarning faolligini, ijodkorligini va kommunikativ salohiyatini oshirishga xizmat qiladi.
Kalit so‘zlar: perseptiv qobiliyat, boshlang‘ich ta’lim, metodik yondoshuv, interaktiv texnologiyalar, o‘z-o‘zini baholash, ijodiy fikrlash.

Kirish. Zamonaviy ta’lim jarayonida o‘quvchining shaxs sifatida har tomonlama rivojlanishi ustuvor yo‘nalishlardan biri hisoblanadi. Ayniqsa, boshlang‘ich ta’lim bosqichida shaxsning psixik funksiyalari, ijtimoiy va aqliy qobiliyatlari shakllanishi muhim o‘rinni egallaydi. Bu jarayonda perseptiv qobiliyatlar — ya’ni vizual, eshitish va boshqa sezgi organlari orqali kelayotgan ma’lumotlarni to‘g‘ri idrok etish va qayta ishlash qobiliyatlari — asosiy ahamiyatga ega.
Perseptiv qobiliyatlar o‘quvchining o‘quv faoliyatida muvaffaqiyatli bo‘lishi, axborotni tez va aniq qabul qilish, uni tahlil qilish va anglash, shuningdek, uni real hayotga tatbiq etish imkonini beradi. Shuningdek, ushbu qobiliyatlar muloqot madaniyati, kuzatuvchanlik, tafakkur, ijodiy fikrlash va mustaqil qaror qabul qilish kompetensiyalarining shakllanishida hal qiluvchi o‘ringa ega.
Mazkur maqolada boshlang‘ich sinf o‘quvchilarida perseptiv qobiliyatlarni shakllantirishga qaratilgan metodik yondoshuvlar, amaliy mashqlar, interaktiv vositalar, guruhiy ishlar va reflektiv faoliyatlar tahlil qilinadi. Bu yondashuvlarning didaktik asoslari va pedagogik samaradorligi amaliy jihatdan o‘rganiladi.
Asosiy qism. Perseptiv qobiliyat – bu o‘quvchining atrofdagi vizual, eshitish va boshqa sezgi organlari orqali kelayotgan ma’lumotlarni to‘g‘ri qabul qilish, ulardan mazmunli xulosalar chiqarish, shuningdek, ularni tahlil qilib, o‘z bilim va tajribasiga moslashtirish imkoniyatidir. Bu qobiliyat o‘quvchining dars jarayonida faolligini, muloqot ko‘nikmalarini, shaxsiy fazilatlarini shakllanishiga va ijodiy fikrlashiga katta ta’sir ko‘rsatadi.
Idrok etish jarayoni insonning sezgi organlari orqali kelayotgan signallarni qabul qilish, ularni tizimlashtirish va ongda aks ettirishdan iborat. Bu jarayonda vizual, eshitish, tegish sezgi

tizimlari o‘zaro bog‘lanib, umumiy dunyoqarashni shakllantiradi. Psixologik tadqiqotlar shuni ko‘rsatadiki, idrok etish jarayoni miyaning faol ishlashi, neyron tarmoqlar o‘rtasidagi aloqalarga va shaxsiy tajriba darajasiga bog‘liq.

O‘quvchilarning perseptiv qobiliyatlarini o‘lchash, ularning psixologik xususiyatlarini aniqlash uchun maxsus testlar va metodikalar mavjud. Shu orqali o‘qituvchi har bir talabaning qabul etish jarayoni, diqqat darajasi, tahlil qilish qobiliyatini baholaydi. Bu nazariy asoslar pedagogik jarayonni individual yondoshuv asosida tashkil etish uchun poydevor bo‘ladi.

Boshlang'ich ta’lim bosqichida o’quvchilarning perseptiv qobiliyatlarini rivojlantirish maqsadida samarali metodik yondoshuvlar ishlab chiqish zarur. Ushbu maqolada ta’lim jarayonida idrok etuvchi qobiliyatlarni oshirishning asosiy metodlari, darslarni tashkil etish usullari va ta’lim texnologiyalarining roli tahlil qilinadi.

1. Amaliy mashqlar va interaktiv o‘yinlar. Dars davomida o‘quvchilarga maxsus idrok etuvchi mashqlar, diqqatni jamlash va vizual xotirani mustahkamlashga qaratilgan o‘yinlar taklif etiladi. Rasm chizish, kontur aniqlash, shakllarni solishtirish kabi vazifalar orqali o‘quvchilarning diqqatini va tahliliy qobiliyatini oshirish mumkin. Ushbu mashqlar o‘quvchilarning ijodiy fikrlashini rag‘batlantiradi hamda ular orqali ma’lumotlarni qabul qilish jarayoni yanada samarali kechadi.

2. Multimediali va interaktiv ta’lim vositalari. Zamonaviy ta’lim texnologiyalari, video, animatsiya, interaktiv dasturlar yordamida darslarni tashkil etish idrok etish jarayonini sezilarli darajada yaxshilaydi. Vizual materiallar va audio tasvirlar orqali o‘quvchilar ma’lumotlarni ko‘rish, eshitish va tahlil qilish imkoniyatiga ega bo‘ladilar. Shu tarzda, dars davomida yaratilgan interaktiv muhit o‘quvchilarning qiziqishini oshiradi va ularning mustaqil fikrlashini rivojlantiradi.

3. Guruhli va jamoaviy faoliyat. O‘quvchilar o‘rtasida guruh bo‘lib bajariladigan topshiriqlar, munozaralar va loyiha ishlarida, ularning o‘zaro muloqoti, tajriba almashinuvi va birgalikda yechim topish qobiliyatlari rivojlanadi. Guruh faoliyati davomida o‘qituvchi har bir o‘quvchining idrok etish darajasini baholab, individual yondoshuvni qo‘llashi mumkin. Bu usul o‘quvchilarning nafaqat intellektual, balki ijtimoiy va emotsional qirralarini ham rivojlantirishga xizmat qiladi.

4. O‘z-o‘zini baholash va refleksiya. O‘quvchilar o‘z o‘qish jarayonini tahlil qilib, qayerda xatolarga yo‘l qo‘yganliklarini aniqlashlari kerak. Refleksiya mashqlari orqali ular o‘z qobiliyatlarini baholab, mustahkamlashga intilishadi. O‘qituvchining qo‘llab-quvvatlashi va konstruktiv fikr-mulohazalari asosida o‘quvchilarning idrok etuvchi qobiliyatlari yanada chuqurlashadi.

Metodik yondoshuvlar va usullar bo‘yicha keltirilgan tavsiyalar orqali, boshlang'ich ta'limda o‘quvchilarning perseptiv qobiliyatlarini tizimli ravishda rivojlantirish, ularning darslarga bo‘lgan qiziqishi va faol ishtirokini ta’minlash mumkin.

Xulosa. Tadqiqot natijalariga ko‘ra, boshlang‘ich ta’limda o‘quvchilarning perseptiv qobiliyatlarini rivojlantirish — ularning o‘quv faoliyatidagi faolligini, mustaqil fikrlashini, bilimlarni ongli ravishda egallashini hamda ijtimoiy-psixologik moslashuvini ta’minlaydi. Interaktiv o‘yinlar, multimediya vositalari, guruhli topshiriqlar va refleksiya usullari orqali o‘quvchilarning sezgi, idrok, tahlil va baholash qobiliyatlari shakllanadi.

Metodik yondashuvlarning izchil va tizimli qo‘llanilishi orqali o‘quvchilarda analitik fikrlash, axborotni tez anglash, muammoli vaziyatlarga ijodiy yondoshish kabi zarur kompetensiyalarni rivojlantirish mumkin. Shu bois, boshlang‘ich ta’limda perseptiv qobiliyatlar bilan bog‘liq mashg‘ulotlar har bir fan doirasida didaktik jihatdan integratsiyalashgan tarzda olib borilishi maqsadga muvofiqdir.

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The Role of Artificial Intelligence in Road Traffic Safety: Applications in Smart Traffic Lights and Pedestrian Crossings

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Abstract
This thesis explores the growing use of artificial intelligence (AI) technologies in improving road traffic safety, with a particular focus on their application in smart traffic lights and pedestrian crossings. Drawing on international experiences from the United States, China, Japan, and Europe, as well as recent pilot projects in Uzbekistan, the study highlights the potential of AI to reduce traffic congestion, prevent accidents, and enhance pedestrian safety. The research methodology includes analysis of academic literature, review of international case studies, and examination of the latest developments in AI-powered traffic management systems during 2023–2025.
Keywords: Artificial Intelligence (AI), Smart Traffic Lights, Pedestrian Crossing Safety, Road Traffic Optimization, Traffic Congestion, Urban Mobility, Intelligent Transportation Systems (ITS)

Introduction

In recent years, road traffic safety has become a growing concern across many urban areas due to rising vehicle numbers, increased pedestrian movement, and frequent traffic congestion. According to the World Health Organization (2023), approximately 1.19 million people die annually in road traffic accidents worldwide. Governments and urban authorities are increasingly turning to artificial intelligence (AI) technologies as modern solutions to these challenges.

AI is being integrated into traffic management systems to optimize traffic light cycles, monitor pedestrian crossings, and improve traffic flow in real-time. Countries like the United States, China, Japan, and several European nations have already launched successful AI-based smart traffic programs, demonstrating measurable reductions in congestion and accidents. Uzbekistan has also started piloting similar systems in its capital, Tashkent, with the installation of smart traffic lights and AI-powered pedestrian monitoring systems in 2023–2025.

This thesis aims to investigate how AI-based traffic technologies can contribute to safer and more efficient urban transportation systems, with a focus on their practical benefits and implementation challenges.

Main Section

Artificial intelligence (AI) is emerging as an effective tool for improving road traffic safety, particularly through smart traffic lights and pedestrian crossing systems. Between 2023 and 2024, several cities across the United States, the United Kingdom, and China have reported positive results from AI-powered traffic control systems. For example, Los Angeles implemented AI in 450+ traffic lights through Google’s Green Light project, reducing average traffic stoppage by up to 30% and improving flow by 12–15% (Wall Street Journal, 2024).

In Hangzhou, China, the Alibaba City Brain system has improved average traffic speed by 15% and reduced accidents by 20% since its deployment in 2022. The AI continuously monitors real-time traffic video feeds to optimize signal timings city-wide.

In terms of pedestrian safety, Tokyo has implemented AI-powered pedestrian crossing systems using advanced sensors and cameras. These systems dynamically adjust signal durations

based on real-time pedestrian presence, leading to a 25% reduction in pedestrian-related accidents (Tokyo Metropolitan Government, 2023).

In the UK, VivaCity's AI-based smart traffic signals on the A34 corridor use sensors to detect cyclists within 30 meters, automatically giving them priority, which has been reported to improve cyclist safety by over 20% (The Times UK, 2024).

Recent research published on arXiv in 2025 shows that reinforcement learning applied to joint pedestrian and vehicle traffic optimization can reduce waiting time by up to 67% in urban areas by analyzing video and Wi-Fi data streams in real time.

In Uzbekistan, notable advancements are also taking place. Since 2023, pilot zones in Tashkent have implemented AI-powered cameras at key intersections. For instance, trials on Bobur and Nukus streets have resulted in a 10–12% reduction in congestion. In 2024, Tashkent expanded its AI traffic program with 30 new AI-equipped intersections, reducing unauthorized public transport lane violations and improving overall flow.

Notably, in June 2025, AI-based pedestrian safety cameras were installed at 10 pedestrian crossings in Tashkent. According to local reports, these systems have led to a noticeable increase in pedestrian safety within just three days of deployment. City officials plan to expand the system to an additional 30 intersections soon.

Moreover, Tashkent launched its first AI-driven Traffic Situation Center in 2025, capable of monitoring real-time traffic flows, reducing congestion by up to 50%, and significantly improving emergency response and road safety.

Overall, the integration of AI into road infrastructure demonstrates clear potential in reducing traffic congestion, improving pedestrian safety, and creating a more efficient urban transport system.

Conclusion

The application of artificial intelligence (AI) in traffic safety systems has shown clear and measurable improvements in both vehicle flow management and pedestrian safety. Real-world implementations in countries like the United States, China, Japan, and the United Kingdom have demonstrated reductions in congestion by 10–30%, quicker response times, and significant decreases in traffic-related accidents—especially at pedestrian crossings.

In Uzbekistan, early pilot projects in Tashkent indicate that AI-based smart cameras and traffic control systems are positively influencing road discipline, reducing congestion, and improving safety without solely relying on fines or penalties. The expansion of AI-powered pedestrian monitoring and adaptive traffic lights—alongside the newly established AI Traffic Situation Center—represents a promising direction for modernizing urban transportation in Uzbekistan.

Overall, AI offers not just technological efficiency but also societal benefits by making roads safer, reducing traffic jams, and ensuring more responsive and adaptive transport infrastructure. Expanding AI integration across more intersections and transport hubs is expected to play a vital role in improving urban mobility and road safety in the coming years.

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Artistic analysis of the creative style in the stories of Sobir Onar

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Abstract
In our small study, which reflects our theoretical views, the issue of the creative style and the relationship between the era and the hero in the stories of the famous representative of 20th century literature, the talented writer and short story writer Sobir Onar was analyzed. For today's writers, the creative path of Sobir Onar serves as a guiding star. His stories are written mainly in a realistic style, and they mostly use the dialects of the Qoshrobat people of Samarkand. The creative style, the poet's personality, and the mind are clearly manifested in the stories. The relevance of the study is determined by the fact that our conclusions will not be useless in determining the development of Uzbek short story writing in the new era, in using the possibilities of the short story genre with a deep look.
Keywords: story, style, hero, image, creator, era.
Annotatsiya
Ushbu nazariy qarashlarimiz aks etgan kichik tadqiqotimizda XX asr adabiyotining taniqli na’moyondasi, iste’dodli yozuvchi va hikoyanavist Sobir O’nar hikoyalaridagi ijodkor uslubi masalasi va davr va qahramon munosabatlari tahlil ostiga olingan. Bugungi kun yozuvchilari uchun Sobir O’narning ijod yo’li yo’lchi yulduz bo’lib xizmat qiladi. Uning hikoyalari asosan realistik uslubda yozilgan bo’lib, ularda ko’proq Samarqandning Qo’shrobot xalqi she’valaridan foydalanilgan. Hikoyalarda ijodkor uslubi, shoir shaxsiyati va meni yaqqol namoyon bo’ladi. Yangi davr o’zbek hikoyanavistligi rivojini belgilashda, teran nigoh bilan hikoya janri imkoniyatlaridan foydalanishda bizning xulosalarimiz ham foydadan holi bo’lmasligi tadqiqotning dolzarbligini belgilaydi.
Kalit so’zlar: hikoya, uslub, qahramon, obraz, ijodkor, davr.

Kirish. Sobir O‘nar — zamonaviy o‘zbek hikoyachiligi taraqqiyotiga salmoqli hissa qo‘shgan ijodkorlardan biridir. Uning hikoyalarida milliylik, hayotiylik va badiiy ifoda uslubi o‘ziga xos poetik kuchga ega. Bu kichik tadqiqotda adibning hikoyalarida aks etgan uslubiy xususiyatlar, obrazlar tizimi va badiiy tasvir vositalari tahlil qilinadi. O‘zbek adabiyotida inson ruhiyatini chuqur tahlil qilish, hayotiy haqiqatni san’at orqali ifodalashda Sobir O’nar o‘ziga xos maktab yaratgan. Uning hikoyalari o‘zbek hikoyachiligida realistik tasvir, ruhiy tahlil va badiiy ifoda uyg‘unligi bilan ajralib turadi. Sobir O‘nar o‘z uslubi orqali o‘quvchini o‘yga toldiradi, jamiyatdagi ziddiyatlarni shaxsiy kechinmalar orqali ko‘rsatadi.
Asosiy qism. Sobir O‘nar uslubi hayotiy voqealarning chuqur psixologik tahliliga asoslangan. Hikoyalarda real voqelik tasviri bilan falsafiy mushohada uyg‘unlashadi. Til soddaligi, ammo chuqur mazmunga ega jumlalar uslubining asosiy belgisi hisoblanadi. Hikoyalarda badiiy tasvir vositalaridan samarali foydalanilgan. Dialoglar orqali xarakter ochilishi ko’zga tashlanadi va dialoglar tabiatga mos, hayotiy ohangda berilgan. Tasviriy vositalari jumladan metafora, epitet, ironiyalardan samarali foydalanilgan. Ichki monolog va tafakkur oqimi orqali obrazlar ichki dunyosi chuqur yoritilgan. Ijodkorning obraz yaratish mahorati ham alohida e’tirofga molik. Yozuvchi hikoyalaridagi obrazlarda oddiy insonlar hayoti orqali umuminsoniy g‘oyalar ilgari suriladi. Obrazlar hayotiy, ko‘p hollarda ichki ziddiyatli qilib tasvirlanadi (masalan, halollik va ijtimoiy nohaqlik o‘rtasidagi kurash) tarzida. Ayol obrazi, oila, mehr, fidoiylik kabi mavzular orqali insoniylik g‘oyasi targ‘ib qilinadi. Hikoyalarda milliy ruh va zamonaviy muammolar ham qalamga olingan. Milliy mentalitet, urf-odatlar, qadriyatlar hikoyalar zamirida aks etadi. Ijtimoiy adolatsizlik, odamlararo munosabatlar, ma’naviy inqiroz masalalari ko‘tariladi. Sobir O‘nar

hikoyalari hayotning o‘zidan olingan voqealarga asoslanadi. U har bir obrazni shunchaki personaj emas, balki jamiyatda yashayotgan haqiqiy inson sifatida tasvirlaydi. Masalan: *"Yo‘qotilgan yillar"* hikoyasida bosh qahramonning o‘tmishdagi xatolari va ular sabab yo‘qotgan orzulari tasviri orqali inson hayoti naqadar mo‘rt ekani ko‘rsatiladi. Bu hikoya orqali yozuvchi insoniy qadriyatlar – kechirim, sevgi, afsuslanish kabi tuyg‘ularni badiiy tasvir orqali o‘quvchiga yetkazadi. Yozuvchining asosiy uslublaridan biri – qahramon ichki kechinmalarini tasvirlash orqali hayotiy haqiqatni ochishdir. U qahramon qalbidagi ziddiyatlar, ikkilanmalar va iztiroblarni lirik ohangda beradi. *"Taqdir"* hikoyasida bosh qahramonning o‘z hayot yo‘lini tanlashdagi ikkilanishi, ichki iztiroblari va kechinmalari o‘quvchini ruhiy jarayonlarga sho‘ng‘diradi. Bu uslub orqali yozuvchi o‘quvchini o‘zini qahramon o‘rniga qo‘yishga undaydi. Sobir O‘nar tili oddiy, xalqona bo‘lsa-da, juda obrazli. U har bir detalni aniqlik bilan tasvirlab, realistik manzara yaratadi. Tabiy holatlar, oddiy suhbatlar orqali chuqur ma’no beradi. *"Dard"* hikoyasida ona va farzand o‘rtasidagi suhbatlar oddiy so‘zlar bilan yozilgan bo‘lsa-da, ularning har bir jumlasi yuraklarga ta’sir qiladi. Ona timsoli orqali abadiy sabr, mehr va sadoqat timsoli beriladi. Yozuvchi bevosita baho bermaydi. U voqealarni, insonlarni ko‘rsatadi – xulosa chiqarishni esa o‘quvchining o‘ziga qoldiradi. Bu uslub orqali o‘quvchi voqealarga befarq bo‘la olmaydi. *"Qaytish"* hikoyasida xorijdan qaytgan yigit va ota-onasi o‘rtasidagi o‘zaro tushunmovchiliklar, mentalitet farqlari orqali yozuvchi jamiyatdagi muhim muammolardan biriga e’tibor qaratadi – ya’ni an’anaviy qadriyatlar va yangilanish o‘rtasidagi ziddiyat. Sobir O‘nar hikoyalarida o‘zbek xalqining urf-odatlari, qadriyatlari, mentaliteti yaqqol aks etadi. Biroq bu an’analar zamonaviy hayot muammolari bilan uzviy bog‘langan. *"Ona duosi"* hikoyasida milliylik – ona duosining qudrati orqali ifodalanadi. Hikoya davomida muallif jamiyatdagi ma’naviy tanazzul, farzandlar va ota-onalar o‘rtasidagi rishtalarning uzilishi kabi muammolarga nazar soladi.

Xulosa. Sobir O‘nar hikoyachiligi o‘zbek adabiyotida o‘ziga xos maktabga ega. Uning badiiy uslubi – real hayot va ruhiy tafakkurning uyg‘un ifodasi bo‘lib, o‘quvchini nafaqat voqeaga, balki obrazlar ichki dunyosiga chuqur singdiradi. Uning asarlari zamonaviy o‘zbek hikoyachiligining badiiy salohiyatini namoyon etadi. Sobir O‘nar o‘z hikoyalarida hayotiy voqealarni chuqur psixologik tahlil bilan uyg‘unlashtiradi. U qahramonlarining ichki dunyosini yorqin ifoda etish orqali o‘quvchini o‘z holatiga qayta nazar tashlashga undaydi. Yozuvchining badiiy uslubi – soddalikda chuqurlik, ifodada samimiyat va obrazlilik bilan ajralib turadi. Uning hikoyalari zamonaviy o‘zbek adabiyotida inson ruhiy olami, axloqiy-axboriy inqiroz va milliy qadriyatlar singari dolzarb mavzularni yoritishda muhim o‘rin egallaydi.

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Theoretical Analysis Of The Concept Of "Loneliness" Based On A Psychological Approach

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Abstract
This article analyzes and applies the theoretical aspects of the concept of "Loneliness" based on psychological approaches. It discusses in detail, first of all, the physiological manifestations of the concept of loneliness and their role in psychology. It also applies the fact that the concept of loneliness expresses different meanings and contents in different spaces. That is, in some places it carries a positive meaning, in some places it carries a negative meaning.
Keywords. Loneliness, concept, content, psychology, physiology, contradiction, positive, negative, space.
Annotatsiya
Ushbu maqolada psixologik yondashuvlar asosida “Yolg’izlik” tushunchasining nazariy jihatlari tahlil va tadbiq etiladi. Unda yolg’izlik tushunchasining avvalo, fiziologik ko’rinishlari va ularning psixologiyada tutgan o’rni haqida batafsil so’z boradi. Shuningdek, yolg’izlik tushunchasining turli makonlarda turlicha ma’no-mazmun ifodalab kelishi tadbiq etiladi. Ya’ni, ayrim o’rinlarda ijobiy, ayrim o’rinlarda salbiy ma’no tashishi tadqiqot markazida o’rganiladi.
Kalit so’zlar. Yolg’izlik, tushuncha, mazmun, psixologiya, fiziologiya, qarama-qarshilik, ijobiy, salbiy, makon.

Kirish. Bir necha o’n yilliklar davomida insonparvarlik nuqtai – nazaridan bizning jamiyatimizda yolg’izlikning bo’lishi mumkin emas,- degan fikr mavjud edi. Ammo bu fikr reallikdan yiroqlasha boshladi. So’nggi paytlarda olimlar tomonidan keksa yoshdagilar yolg’izligi muammosi bilan bir qatorda o’smirlar va yoshlar o’rtasidagi yolg’izlik masalasiga ham e'tibor qaratila boshlandi.
Yolg’izlik muammosi insoniyatning eng jiddiy muammolaridan biri bo’lib, bunda inson u yoki bu sabablarga ko’ra na do’stlik, na muhabbat, na dushmanlik munosabatlarini o’rnata oladi. Inson o’z munosabatlarining to’laqonli va ahamiyatli emasligini his qilganida muloqot ehtiyojlari qondirilmaganda yanada o’zini yolg’izroq his qila boshlaydi. Yolg’izlik nazariyalarini falsafiy va psixologik tahlil qilish natijasida uning obyektiv va subyektiv, ijobiy va salbiy jihatlarini farqlash mumkin. Yolg’izlikning obyektiv tomoni ijtimoiy munosabat va faktlar bilan bog’liq. Sub'yektiv tomoni esa shaxsning xususiyatlari bilan bog’liq holda namoyon bo’lishidir. Yolg’izlikning ijobiy (pozitiv) jihati uning shaxs ijtimoiylashuvi va individualligi shakllanishining ajralmas qismi ekanligidadir. Yolg’izlikning ijobiy imkoniyati: o’zini-o’zi bilish, o’zini-o’zi boshqarish, ijod qilish, o’zini-o’zi takomillashtirish, psixofizik holatlarini barqarorlashtirish, tashqi ta'sirlardan o’z “Men”ini muhofaza qilish kabi vazifalarda namoyon bo’ladi. Yolg’izlikning salbiy (negativ) tabiati- u o’ziga barcha psixik jarayonlarni bo’ysundiradi, shaxsning ichki yaxlitligini buzadi, psixologik himoya mexanizmi sifatida namoyon bo’ladi. Atrofdagilardan ko’p narsani kutishga, shaxs sifatida shakllanishidagi boshqalarning rolini oshirib baholashiga olib keladi. Yolg’izlikning negativ va pozitiv jihatlari o’rtasidagi dialektik munosabatni e'tiborga olgan holda ta'kidlash joizki, muayyan sharoitlarda (yolg’izlikni anglaganda, unga munosabatning faol uslubi shakllanganda, qiyinchiliklar bilan kurashish tajribasi tarkib topganda, yolg’izlik motivatsiyalanganda) negativ yolg’izlik pozitiv ahamiyat kasb etishi ham mumkin.[1][1]

[1] Majidov, J. (2020). O’SMIRLIK DAVRIDA YOLG’IZLIK HISSI NAMOYON BO’LISHINING AYRIM XUSUSIYATLARI. Архив Научных Публикаций JSPI.

Psixologik-pedagogik yordam nuqtai nazaridan yolg'izlik hissi dinamikasini kuzatish juda katta qiyinchiliklarni vujudga keltiradi. Shunga qaramay o'qituvchiga o'quvchi shaxsining shakllanishidagi o'zgarishlarni "oldindan bilish" imkonini beruvchi bir necha omillarni ko'rsatib o'tish mumkin; Birinchidan, barqaror yolg'izlikni kelib chiqishiga qulaylik tug'diruvchi shaxs xususiyatlari (xarakter sifatlari) ni aniqlash:

- yuqori darajadagi xavotirlik;
- ta'sirlanuvchanlik;
- xavoyilik(romantiklik);
- mustaqillik, sustkashlik, emotsionallik;
- odamovilik, indamaslik, o'zini chetga olish;
- yuqori darajada ruhiy azoblanish (iztirob chekish);
- jizzakilik;
- itoatkorlik, qo'rqoqlik;
- individualizm(yakkalanish), tengdoshlariga o'xshamaslik. Ikkinchidan, yolg'izlikning rivojlanishiga ta'sir etuvchi ijtimoiy va psixologik-pedagogik omillar: - Oiladagi muhit (oilaning to'liqligi, moddiy ta'minlanganligi, a'zolari soni);
- O'quv faoliyatidagi muvaffaqiyatlar;
- Xulq-atvor reaksiyalarining adekvatligi (tashqi ta'sirlarga mosligi). Agar yolg'izlikning shakllanishiga olib keluvchi vaziyatlarni aniqlash oson bo'lsa, uni saqlanib qolishi va qanchalik uzoq davom etishiga ta'sir ko'rsatuvchi omillarni a niqlash mushkuldir. Yangi ijtimoiy guruhga tushib qolgan o'smirlar unga moslashishga, yangi muloqot doirasidagi kamchiliklarni bartaraf etishga harakat qiladilar. O'smir uning yolg'izligiga sabab bo'lgan vaziyat oldida o'zini ojiz his qilsa, ruhi tushib ketadi va uni bartaraf etish uchun hech qanday qarorlar qabul qila olmaydi yoki aksincha, yolg'izligiga sabab bo'lgan vaziyatni to'liq anglash uni qat'iyat bilan harakat qilishga undaydi. Yolg'izlikning sababini to'g'ri tushunmaslik uni uzoq vaqt davom etishiga olib keladi.

Yaxshi, unda quyida maqolaga sizning shaxsiy izlanishlaringizni hisobga olgan holda qo'shimcha izohlar, ilmiy yondashuvlar va manbalar ro'yxati keltiriladi. Bu uni rasmiyroq va ilmiy maqolaga yaqinlashtiradi.

Mashhur psixolog John Cacioppo tadqiqotlarida yolg'izlik – bu nafaqat tashqi izolyatsiya, balki ichki emotsional ehtiyojlarning qondirilmasligidir, deya ta'kidlanadi. Shuningdek: **Maslou** ehtiyojlar ierarxiyasiga ko'ra, insonning "ijtimoiy tegishlilik" (belongingness) ehtiyoji qondirilmasa, ruhiy iztiroblar yuzaga keladi.

Eriksonning psixososial rivojlanish bosqichlarida esa, katta yoshlilarda "yolg'izlik vs. yaqinlik" muammosi asosiy psixologik sinov sifatida keltiriladi.

Xulosa. Yolg'izlik – har bir inson hayotining ma'lum bosqichida uchraydigan holatdir. Bu holatni tushunish va to'g'ri boshqarish psixologik salomatlikni ta'minlashda muhim omil hisoblanadi. Shaxsiy tajribalar va ilmiy yondashuvlar asosida aytish mumkinki, ixtiyoriy yolg'izlik ba'zan ruhiy tiklanish vositasi bo'lsa-da, ijtimoiy yolg'izlikning surunkali tus olishi xavfli oqibatlarga olib kelishi mumkin. Shu sababli, har bir inson o'z holatini tahlil qilishni, ehtiyojlarini aniqlashni va kerakli paytda yordam so'rashni o'rganishi zarur.

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Causes Of Gout, Symptoms And Methods Of Prevention, As Well As Treatment Prophylaxis

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Abstract
This article provides information on the causes of gout, its manifestations and symptoms, preventive measures and treatment measures, and a brief literature review.
Keywords: Hyperuricemia, purine bases, Hypoxanthine-guanine phosphoryltransferase (GKGFT), premorbid stage, pseudophlegmonosis, urate salts.
Annotatsiya
Mazkur maqolada hozirgi kunda O‘zbekiston aholisi orasida keng tarqalib borayotgan podagra kasalligining kelib chiqish sabablari, namoyon bo‘lishi harakteristikasi va simptomlari, kasallikning oldini olish hamda davolash chora tadbirlari to‘g‘risida ma’lumotlar va qisqacha adabiyotlar sharhi keltirilgan.
Kalit so‘zlar. Giperurikemiya, purin asoslari, Gipoksantin-guaninfosforizoltransferaza (GKGFT), premorbid bosqich, psevdoflegmonoz, urat tuzlari.

Kirish. Podagra [1] –organizmdagi turli shakldagi urat kristallarining, monourat yoki siydik kislotasi shaklida, xar xil to‘qimalarda cho‘kishi bilan tavsiflanadigan metabolik kasallik hisoblanadi. Podagra- qadim zamonlardan beri ma’lum. Kasallikning birinchi hujjatli dalillari qadimgi Misrdan kelib chiqqan va miloddan avvalgi 2600 yilga to‘g‘ri keladi.Ular bosh barmog‘ining podagra artritining tavsifiga asoslanadi. Miloddan avvalgi V asrda qadimgi yunon tabibi va shifokori Gippokrat o‘zining „Aforizmlari“ da podagra artritining klinik belgilarini tasvirlab berdi, u yerda kasallik menopauzadan oldin amaldorlar va ayollarda sodir bo‘lmasligini ta’kidladi [2] . Rim faylasufi va shifokori Aulus Korneliy Celsus podagra rivojlanishi va spirtli ichimliklarni iste’mol qilish va unga bog‘liq bo‘lgan buyrak kasalliklari bilan bog‘likni ko‘rsatib berdi [3] . 150-yilda Galen aytganidek, podagra „noto‘g‘rilik, beparvolik va irsiyat“ [4] tufayli yuzaga keladi.Podagra - bu organizmda siydik kislotasi va uning tuzlari (giperurikemiya) darajasining oshishi fonida artrit belgilari bilan tavsiflanadigan kasallik. Siydik kislotasi darajasining har doim ham oshishi podagraga olib kelmasligi mumkin,lekin yosh ulg‘aygan sari kasallikning rivojlanish xavfi ortadi. Podagra bilan kasallanish 1000 kishiga 3 ta holatni tashkil qiladi, bunda erkaklar ayollarga qaraganda podagra bilan taxminan 20 marta ko‘proq og‘riydilar.Biroq, so‘nggi yillarda ayollarda podagra bilan kasallanishning o‘sishi kuzatilmoqda va 50 yoshdan keyin jinslar o‘rtasidagi kasallanish farqi qisqarmoqda.Tananing yumshoq to’qimalarida tuz kristallari shakllanishi va yig’ilib qolishiga sabab bo’ladigan qonda siydik kislotasining barqaror oshib borishi — podagra rivojlanishining yagona sababidir. Giperurikemiyaning boshlang’ich bosqichi, ya’ni sidyik kislota darajasining oshishi tuz kristallari shakllanishiga va yig’ilib qolishiga sabab bo’lmaydi, lekin modda almashinuvidagi jiddiy buzilishlardan dalolat beradi, bu esa ushbu kasallikning dastlabki belgisidir.Siydik kislota konsentratsiyasining o’sishiga bir necha omillar ta’sir ko’rsatishi mumkin. Asosiylari — irsiy moyillik, organizmga oziq-ovqat bilan ko’p miqdorda purin birikmalajori tushishi, purinlar katabolizmining (parchalanishining) ko’payishi, shuningdek, disfunktsional yoki yosh bilan bog’liq. BirlamchiOziq-ovqat bilan organizmga kiradigan purin asoslarini qayta ishlash yoki tana hujayralarining nobud bo’lishi natijasida siydik kislota hosil bo’ladi. U buyrak kanalchalarida filtrlanadi va odatda siydik bilan organizmdan chiqarib tashlanadi. Agar biron bosqichda buzilishlar yuz bersa (siydik kislotasini ko’p ishlab chiqarish, uni organizmdan

chiqarib tashlay olmaslik) giperurikemiya rivojlanishi uchun sharoit paydo bo'ladi. Shuni ham aytib o'tish kerakki, «giperurikemiya» tashxislanishi podagra mavjud degani emas, chunki siydik kislotasining oshishi boshqa kasalliklar bilan bog'liq bo'lishi mumkin. Biroq giperurikemiya podagrali jarayonlarning rivojlanishiga ko'proq sabab bo'lishi mumkin.Podagrada siydik kislotasi kaltsiy, natriy, kaliy va boshqa elementlar bilan reaksiyaga kirishib, kristall birikmalar yoki uratlarga aylanadi. Uratlar asosan ikki ta joydagi to'qimalarda to'planadi:Siydik ajratish a'zolarida (buyrakdagi toshlar, siydik yo'li toshlari). Bo'g'imlar yumshoq to'qimalari, bo'g'im atrofi to'qimalarida.Bu to'qimalarda qon aylanishining o'ziga xos xususiyatlari tufayli uratlar u yerga tushib, cho'kindi bo'lib to'plana boshlaydi.Siydik orqali siydik kislotasini chiqarib yuborish jarayonining sekinlashuvi hisoblanadi.Podagra shakllanishining xavf omillari qondagi siydik kislotasi darajasining oshishiga olib keladigan holatlarni o'z ichiga oladi. Bunga sabab quyidagilar bo'lishi mumkin:Siydik kislotasining tushishi: Oqsilni, ayniqsa qizil go'shtni ortiqcha iste'mol qilish.Endogen hosilalar: Masalan, o'smaga qarshi terapiyada yoki autoimmun jarayonlarda. Bu ikklamchi podagra hisoblanadi. Uratlar chiqarilishining buzilishi:Buyrak yetishmovchiligi bilan kechuvchi buyrak kasalliklarida, shok holatlarida, alkogolni suiiste'mol qilishda. Podagrada alkogolni ishlatish tavsiya etilmaydi.Ayniqsa purinlar almashinuvining buzilishida irsiy moyillik ham rol o'ynaydi. Birlamchi podagra holatlarining taxminan 10% ini genetik omillar keltirib chiqaradigan idiopatik podagra tashkil etadi. Qolgan 90% siydik kislotasi chiqarilishining buzilishi bilan bog'liq.Nuklein kislotalarni tashkil etuvchi purin asoslari (adenin va guanin) ovqatdan olinadi yoki organizmda sintezlanadi. Gipoksantin-guaninfosforizoltransferaza (GKGFT) tanqisligi va 5-fosforizol-1-sintetaza faolligining oshishi kabi purinlar metabolizmidagi buzilishlar siydik kislotasi sintezining ko'payishiga va podagra rivojlanishiga olib kelishi mumkin. **Podagra diagnostikasi klinik va laborator mezonlarni o'z ichiga oladi:** Klinik mezon: Tofuslarning mavjudligi. Laborator mezon: qondagi siydik kislotasi darajasining oshishi. Erkaklar va ayollar uchun chegara qiymatlari farq qiladi (>0,42 mmol/l erkaklarda va >0,36 mmol/l ayollarda). Shuningdek, siydikdagi siydik kislotasi miqdori, ba'zan bir haftalik davolovchi parhezdan keyin dinamik ravishda tekshiriladi.Podagra diagnostika qilish uchun asosiy tahlil - qon biokimyosi.Klinik belgilarsiz giperurikemiya tashxis qo'yish uchun yetarlicha natija bermaydi, chunki siydik kislota darajasi yuqori bo'lgan bemorlarning 10% dan kamida artrit rivojlanadi.Qo'shimcha diagnostika usullariga teri ostida, balki suyaklar yoki ichki organlarda ham joylashishi mumkin bo'lgan tofuslarni baholash uchun bo'g'imlarning rentgen tasvirlari va ultratovush tekshiruvlarini o'z ichiga oladi. Rentgenologik tekshirishda surunkali podagrada tog'ay destruksiyasi belgilari va suyak chetlarida eroziyalar borligi topiladi.Kolxitsin bilan sinov tariqasida davolash ba'zan tashxisni aniqlashtirish uchun qo'llaniladi, chunki tez ijobiy dinamika podagrani tasdiqlaydi.Erkaklardagi podagra ayollarga nisbatan podagra erkaklarda ko'proq uchrashi ikki omilga bog'liq: kasallikning qisman nasli surishi, u X xromosoma orqali nasldan-naslga uzatiladi, erkaklarda esa ushbu xromosoma bitta (XY) bo'lganligi tufayli boshqa variantlarning mavjud emasligi;Erkaklar uchun odatiy bo'lgan noto'g'ri ovqatlanish odatlari va spirtli ichimlik iste'moli.Erkaklardagi podagraning o'ziga xos xususiyati ushbu jins vakillarining shifokorga podagraning o'tkir xurujlari davrida yoki kasallik tashqi belgilari paydo bo'la boshlagach — bo'g'imlarning deformatsiyasi va tofuslar shakllangach borishidir.Ayollarda podagraning xususiyatlari ayollarda yumshoq to'qimalarda siydik kislotasi darajasining oshishi va uratlarning, tuz kristallari to'planib qolishi bilan kechadigan jarayonlar klimaks davriga xosdir. Ushbu davrda podagra xavfi sezilarli darajada ko'payadi, ayniqsa irsiy moyillik mavjud bo'lsa, shuning uchun ayollardagi podagra ko'pincha 50-55 yoshlik davrda tashxis qilinadi. Ayollarning genetik moyilligi erkak jinsidan farqli o'laroq faqat ehtimolli bo'ladi. Purin birikmalarining metabolizmi uchun zarur bo'lgan fermentlarni ishlab chiqarishga javobgar bo'lgan gen X xromosomada joylashgan bo'lib, bunday xromosomalar ayollarida ikkita bo'ladi (XX). Shuning uchun, agar xromosomadagi bir genga zarar yetkazilgan bo'lsa, uning funktsiyasiyasi boshqa xromosomadagi genning intensiv faoliyati bilan qoplanadi.Agar ikkala gen xam zararlangan bo'lsa, ayollarda podagra rivojlanish xavfi erkaklardagi bilan bir xil bo'ladi

(deyarli 100%), kasallik boshlanish yoshi ham sezilarli darajada kamayadi.Bolalarda podagra kasalligi organizmda siydik kislota darajasining oshishi — giperurikemiya bolalik davrida birlamchi holat yoki kasallik fonidagi ikkilamchi disfunktsiya hisbolanadi va bu irsiyat tufayli emas.Bolalarda podagra hujayralarning faol nobud bo'lishi oqibatida yuzaga keladi, bu esa o'z navbatida ko'p miqdorda purin ishlab chiqarilishiga olib keladi. Hujayralarning ko'p nobud bo'lishi suvsizlanganda, och qolganda, buyrak yetishmovchiligi yoki buyraklarning boshqa patologiyasida, turli xildagi o'simtalarning mavjudligida yuz berishi mumkin. Shuningdek, bolalikdagi podagra etiologiyasida to'liq yoki qisman gipoksantinguaninfosforiboziltransferaza yetishmovchiligi va fosforibozilpirofosfatsintetazaning o'ta faolligi ham mavjud.[5] **Podagraning bosqichlari.** Podagraning bosqichlari quyidagi ko'rsatkichlarga qarab ajratiladi:Kasallikning ma'lum bosqichlariga xos bo'lgan klinik tasviri, qonda siydik kislotasi darajasi, qattiq uratlar, kristalli birikmalar mavjudligi.Ushbu ma'lumotlar asosida podagraning uch bosqichdan biri farqlanadi:Boshlang'ich premorbid bosqich — giperurikemiya bilan tavsiflanadi, qonning biokimyoviy tahlili natijasida aniqlanadi. Bo'g'imlar va siydik chiqarish tizimi shikastlanishi belgilari kuzatilmaydi, lekin nomaxsus belgilari bo'lishi mumkin: vazn olishga moyillik, ovqat hazm qilish tizimidagi buzilishlar (tez-tez qabziyat, defakatsiyadagi qiyinchiliklar), terining qichishi va boshqalar;Intermittilovchi yoki oraliq bosqich — bo'g'im atrofidagi to'qimalarda tuz kristallarining paydo bo'lishi, kam hollarda buyrak to'qimalarida ham. Bu bosqich og'riq boshlanishi, bo'g'imlarning o'tkir yallig'lanishi, podagra xurujlari kabi belgilar bilan namoyon bo'ladi. O'tkir og'riq o'zidan-o'zi yo'qoladi va remissiya (oraliq yaxshilanish davri) boshlanadi, xurujlar 3-7 kun davom etadi. Podagra xurujlari boshlanishiga suvsizlansih, alkogolli ichimliklar ichish, noto'g'ri ovqatlanish, och qolish, sovqotish, o'tkir yuqumli kasalliklar, jarrohlik aralashuvi kabilar turtki bo'lishi mumkin;Podagraning surunkali bosqichi xurujlar va remissiya davrlarining almashinuvi bilan kuzatiladi. Bu bosqich interval tofuslar shakllanishi va kichik tuz kristallari birikishi bilan tavsiflanadi. Kasallikga bo'lgan beparvolikka qarab tofuslar hajmi sezilarli darajada bo'lishi mumkin, og'riq berishi mumkin. Bu bosqich shuningdek shikastlangan bo'g'im sohasidagi terining qizarishi, bo'g'im harakatchanligining buzilishi, gipertermiya va mahalliy to'qimalardagi yallig'lanishni ham o'z ichiga oladi. Podagraning surunkali bosqichida ko'pincha siydiktosh kasalligi ham rivojlanadi.Intermittiv va surunkali bosqichlar o'tkir og'riqli xurujlar bilan kechadi. Ko'pincha og'riq kechki va tungi vaqtlarda boshlanadi, hududiyligi esa shikastlangan bo'g'imdan tortib, to tana qismining oxirigacha tarqalishi mumkin. Yumshoq to'qimalarda yig'ilgan qattiq uratlar, kristallar bo'g'imlarni, pay birikmalarini jarohatlaydi va kuchli og'riqqa sabab bo'ladi, yana bunga yallig'lanish tufayli kelib chiqadigan og'riq ham qo'shiladi.Xurujlar vaqtida og'riq qoldiruvchi preparatlar qabuI qilish hech qanday foyda bermaydi. Og'riq jarohatlangan sohaga yengil bosilganda ham kuchayadi.Ko'pincha oyoq bosh barmog'ining bo'g'imlari — plyusnefalanga bo'g'imi shikastlanadi,chunki bu sohada o'ziga xos qon aylanish tizimi mavjud. Bunday joyda uratlarningning to'planishi podagraga chalingan bemorlarning 50 foizidan ko'prog'ida qayd etiladi. Shuningdek qo'ldagi barmoqlar, bilak, tirsak, tovon, tizza, son va boshqa tana qismlari bo'g'imlari shikastlanishi ham mumkin. Podargani davolash. Kasalxonaga yotqizish: birinchi marta qo'zg'alganda, davolash bilan revmatolog, terapevt yoki jarroh kabi shifokorlar davolaydi. Podagra bilan og'rigan bemorlarning 60-80 foizida klassik og'ir xurujlar va yaqqol klinik belgilar aniqlanadi. Surunkali kasallikning remissiyasi fonida qattiq og'riq boshlanadi, xurujdan keyin remissiya davri qaytadan boshlanadi.Xurujning davomiyligi bemorning umumiy holatiga, terapiya turlariga va kasallikning bosqichiga bog'liq. Jarohatlangan bo'g'im sohasidagi o'g'riqqa qo'shimcha ravishda umumiy sog'lik holatining buzilishi, holsizlik, bosh og'rig'i, subfebril darajadagi isitma, shish, qizarish, bo'g'im atrofidagi terining ko'karishi (sianoz) kuzatiladi.Podagraning shunindek quyidagi shakllari farqlanadi:O'tkir osti shakli — sustroq namoyon bo'ladigan simptomatika bilan tavsiflanadi, yaqqol namoyon bo'ladigan og'riqlarsiz, shishlarsiz kechadi;Psevdoflegmonoz shakli — podagraga xos klinik tasvirdan farqlanadi: periartikulyar (bo'g'im atrofi) to'qimalarning o'tkir yallig'lanishi, yuqori tana harorati (39 °C va

undan baland), ahvolning yomonlashuvi, varaja, tananing umumiy intoksikatsiyasi alomatlari kuzatiladi;Revmatoidga o'xshash podagra shaklida klinik tasvir revmatologik kasalliklariga o'xshash bo'ladi, masalan, surunkali artrit. Odatda bu shaklda alomatlar barmoqlar va bilaklarning bo'g'imlari hududida tez-tez uchraydi. Ushbu shakldagi podagra xurujlar davomiyligi bilan ajralib turadi, ular bir necha haftadan bir oygacha davom etadi;Podagraning alohida shakli infektsion-allergik poliartrit bilan o'xshash alomatlar bilan birga keladi. Bemorlarning 5% da migratsiya qiluvchi poliartritning klinik ko'rinishi kuzatiladi, keyin tashxisga aniqlik kiritilgach, maxsus podagra deb ajratiladi;Kam alomatli podagrada xira alomatlar, yengil og'riq, biroz shish, ta'sirlangan bo'g'im ustidagi terining qizarishi bilan kechadi.
Umumiy chora-tadbirlar: oyoqlarni mahkamlash, muz, isitadigan kompresslar, ko'p ichimlik ichish yoki infuzion terapiya.
Dori vositalari: Og'riq va yallig'lanishni kamaytirish uchun kolxitsin yoki YAKNDV.Glyukokortikosteroidlar NYAQVning yetarli ta'sir ko'rsatmaganda.
Fizioterapiya:Ultrabinafsha nurlar, O'YuCh, impulsli toklar, dimeksid applikatsiyalari. Parhez: purinlarni cheklash (go'sht, baliq, qahva, choy).Erta tashhislash va adekvat davolashda podagra kamdan-kam hollarda jiddiy oqibatlarga olib keladi va kamdan-kam hollarda o'tkirlashadi.To'g'ri davolanmasa, giperurikemiya bo'g'imlarning qaytmas deformatsiyasiga va ularning harakatchanligining cheklanishiga olib kelishi mumkin.Podagra ko'pincha buyrak funksiyasini yomonlashtiradigan va giperurikemiyani kuchaytiradigan siydik-tosh kasalligi bilan birga keladi.Xavf guruhi:Keksa yoshdagi erkaklar.Ateroskleroz, qandli diabet, buyrak kasalliklari, arterial gipertenziya bilan og'rigan shaxslar.O'smaga qarshi davo olayotgan bemorlar.Oilaviy podagra tarixiga ega shaxslar.Ko'p oqsilli ovqat iste'mol qiluvchilar va spirtli ichimliklarni suiiste'mol qiluvchilar. Podagra profilaktikasi:to'g'ri ovqatlanish: asosiy e'tibor qondagi siydik kislotasi darajasini nazorat qilish va parhezga qaratilishi kerak. Tavsiya etiladi:Oqsil va yog'larni iste'mol qilishni cheklash.O'tkir va dudlangan taomlar, konservantlar va ziravorlarni chiqarib tashlang.Sabzavotlar (dukkaklilardan tashqari), mevalar va sut mahsulotlari miqdorini ko'paytirish.Uratlar ajralishini yaxshilash uchun ko'p suyuqlik iching.Alkogolni cheklash: Siydik kislotasi darajasini oshirish xavfini kamaytiradi.Kasallikning oldini olish, ayniqsa, oilada podagra bemorlari bo'lsa yoki uning xavfini oshiradigan kasalliklar aniqlanganda juda muhim. Agar inson podagra xavfi ostida bo'lmasa ham quyidagi qoidaga rioya qilishi kerak. Sababi podagra faqat qariganda emas, balki yosh va sog'lom insonlarda ham uchrashi mumkin.Ko'proq suyuqlik ichish – suv tanada peshob kislotasini eritishi va uni chiqarib tashlashga xizmat qiladi.Vaznni nazorat qilish – tadqiqotchilar ortiqcha vazn podagra xavfini sezilarli darajada oshiradigan jiddiy omillardan biri ekanligini isbotladi. Inson qanchalik to'la bo'lsa, uning tanasi peshob kislotasini shuncha tez ishlab chiqaradi va buyrak ishlashi esa sekinlashadi.To'g'ri ovqatlanish – peshob kislotasini ishlab chiqaradigan oziq-ovqat mahsulotlarini kamaytirish zarur. Masalan, go'sht, soya, loviya, yasmiq, no'xat kabilar.Spirtli ichimliklardan voz kechish – umuman ushbu ichimliklarni qabul qilish mumkin emas. Lekin ayrim juda qattiq bog'lanib qolganlar iloji boricha kamayitrishga harakat qilishi kerak.Yo'ldosh kasalliklarni davolash: Podagra rivojlanishini oldini olishga yordam beradi.Organizmni umumiy mustahkamlash: almashinuv jarayonlarini qo'llab-quvvatlash va yurak-qon tomir va nafas olish tizimlari ishini yaxshilash uchun dozalangan jismoniy mashqlar tavsiya etiladi.ParhezPodagra paytida ovqatlanish:Parhezning asosiy tamoyillari (6-stol):Istisno: purinlarga boy mahsulotlar (go'sht, baliq, dukkaklilar), oksalat kislotasi, dudlangan mahsulotlar, tuzli va achchiq pishloqlar, qovurilgan va tuzlangan baliq, ikralar, konservalar.Cheklov: oqsillar (parhezli go'sht navlariga ustunlik berish - kurka, quyon, tovuq), qiyin eriydigan yog'lar, tuz.Ko'paytirish: suyuqlik iste'moli (qarshi ko'rsatmalarni hisobga olgan holda), sut mahsulotlari, sabzavotlar, mevalar.Sho'rlanish: sut mahsulotlari, sabzavotlar, mevalar; vegetariancha parhez afzalroq.Ruxsat etilgan mahsulotlar: ko'katlar (petrushka va ko'k piyozdan tashqari), qaynatilgan go'sht va baliq.Taqiqlangan mahsulotlar va ichimliklar:Oziq-ovqatlardan: submahsulotlar, dukkaklilar, souslar, ziravorlar.Ichimliklardan: qahva, kakao, achchiq choy,

alkogol (jumladan, pivo).Shirinlikdan: shokolad, krem.Rezavorlardan: malina, uzum, anjir.Ruxsat etilgan ichimliklar:Sharbatlar (ayniqsa, yangi siqilganlari), qatiq mahsulotlari (yogurt, kefir), sut.Afsuski, podagrani to‘liq davolashning iloji yo‘q. Ammo zamonaviy tibbiyotda kasallikning oldini olish va og‘riqni to‘xtatish uchun kerakli muolajalar qilinadi. Buning uchun og‘riq qoldiruvchi va yallig‘lanishga qarshi dorilar qo‘llanadi. Shuningdek, fizioterapiya ham buyuriladi[6]. Kasallikni davolashning eng yaxshi usuli esa parhez bo‘lib qolmoqda. Masalan, qizil go‘sht, spirtli ichimliklar, qo‘ziqorin va dukkakli o‘simliklarni ratsiondan chiqarish tavsiya etiladi. Agar tofuslar shakllana boshlagan bo‘lsa, u holda ularni jarrohlik yo‘li bilan olib tashlash mumkin.Davolashda asosan sink oksidi. Vonoprazan, Ubrogepant, Trazodon, Tramadol kabi preparatlardan foydalanish yaxshi samara beradi.[7]

Xulosa: Podagra ko‘pincha bo‘g‘im og‘riqlari bilan bog‘liq kasallik hisoblanadi. Odatda bu kasallik oqsilli mahsulotlarni ko‘p iste’mol qilish yoki fermentlar faoliyati, funksiyasi, tuzilishi o‘zgarishi natijasida kelib chiqadi. Kasallikni oldini olish uchun sog‘lom turmush tarziga amal qilish muhim sanaladi. Davolashda albatta siydik va qon tahlillari tekshiriladi. Bu kasallik afsuski hozirda aholi orasida keng tarqalib va yosharib bormoqda.

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A Comparative Study Of Figurative And Idiomatic Expressions In English And Uzbek: Insights Into Translation And Cross-Cultural Communication

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Abstract
This brief academic paper analyzes the similarities and differences between figurative and idiomatic expressions in English and Uzbek. The study explores the semantic features of idiomatic units, their role within the national mentality, challenges in the translation process, and their significance in cross-cultural communication. Since language is not only a means of communication but also a cultural mirror, translating idioms and figurative expressions requires attention to both linguistic and cultural context. The research examines semantic differences and translation strategies through examples of English and Uzbek idioms.
Keywords: idiom, phraseology, translation, culture, semantics, language, colloquial expression.
Annotatsiya
Ushbu kichik ilmiy ishda ingliz va o‘zbek tillaridagi frazeologik birliklar va obrazli ifodalar o‘rtasidagi o‘xshashlik va farqlar tahlil qilinadi. Idiomatik ifodalarning semantik xususiyatlari, ularning milliy mentalitetdagi o‘rni, tarjima jarayonidagi qiyinchiliklar va madaniyatlararo kommunikatsiyadagi roli tadqiq etiladi. Til — nafaqat aloqa vositasi, balki madaniy ko‘zgu bo‘lgani bois, idiom va obrazli ifodalar tarjimasida faqat lingvistik emas, balki madaniy kontekstga ham e’tibor qaratish zarur. Tadqiqot davomida inglizcha va o‘zbekcha idiomalar misolida semantik tafovutlar va tarjima strategiyalari ko‘rib chiqiladi.
Kalit so‘zlar: idiom, frazeologizm, tarjima, madaniyat, semantika, til, xalqona ifoda.

Kirish. Har bir til o‘ziga xos obrazli va idiomatik ifodalari orqali milliy tafakkur, tarixiy tajriba va madaniy qadriyatlarni aks ettiradi. Idiomlar — tildagi tayyor birikmalar bo‘lib, ko‘pincha to‘g‘ridan-to‘g‘ri tarjima qilishga yaroqsiz bo‘ladi. Ingliz va o‘zbek tillarida ham idiomatik ifodalar keng qo‘llanadi, biroq ularning mazmuniy yuklamasi, konnotatsiyasi va madaniy asoslari turlicha bo‘lishi mumkin. Shu sababli, ularni tarjima qilishda faqat so‘zma-so‘z yondashuv emas, balki madaniy interpretatsiya muhim rol o‘ynaydi. Ushbu mavzuning dolzarbligi shundaki, bugungi globallashuv davrida til va madaniyatlararo muloqot chuqurlashmoqda, tarjima esa ushbu jarayonning ajralmas qismiga aylangan.
Asosiy qism. Frazeologik ifodalarni tarjima qilishda ikki asosiy muammo yuzaga keladi: semantik nomuvofiqlik va madaniy kontekstning yo‘qligi. Masalan, ingliz tilidagi “kick the bucket” ifodasi “o‘lmoq” ma’nosida ishlatilsa, o‘zbek tilida unga yaqin “ko‘z yummoq” yoki “olamdan o‘tmoq” deyiladi. Biroq “tuprog‘i tor bo‘lsin” kabi xalqona ifodalar ham bor. Bu kabi misollar ikki tilning idiomatik lug‘ati va xalq mentaliteti qanday farqlanishini ko‘rsatadi. Shuningdek, ko‘p hollarda idiomlar tarjimada funksional ekvivalent orqali beriladi. Masalan:“Break the ice” – “muomala boshlash”, o‘zbekchada: “muzni eritmoq” tarzida; “The ball is in your court” – “qaror sening qo‘lingda”. Ayrim idiomlar esa madaniy jihatdan unikal bo‘lib, ularni to‘g‘ridan-to‘g‘ri tarjima qilish xatoga olib keladi. Masalan, “raining cats and dogs” – kuchli yomg‘irni anglatadi, lekin o‘zbekchada “to‘kilib quyilgandek yomg‘ir yog‘di” deyish to‘g‘riroq. Bu kabi holatlarda madaniy moslashtirish strategiyasi qo‘llanadi. Bundan tashqari, tarjima jarayonida idiomatik ifodalarning madaniy yukini to‘liq yetkazish muhimdir. Misol uchun, o‘zbek tilida ishlatiladigan 'Choy uzatmoq' iborasi shunchaki ichimlik taklif qilish emas, balki

mehmondo‘stlik va hurmat ifodasi sifatida qadrlanadi. Ingliz tiliga bunday iborani oddiy “to offer tea” deb tarjima qilish yetarli emas — bu yerda uning konnotatsiyasini, ya’ni ijtimoiy munosabatlar ramzi ekanligini tushuntirish lozim. Tahlillar shuni ko‘rsatadiki, ko‘plab inglizcha idiomlar (masalan, “spill the beans” — “sirlab turgan gapni ochish”, “hit the sack” — “uyquga yotmoq”) o‘zbek tilida to‘g‘ridan-to‘g‘ri muqobilga ega emas. Tarjimon ularning kontekstual ma’nosini topishi yoki ekvivalent bo‘lgan xalqona ifodalarni izlashiga to‘g‘ri keladi. Bu esa tarjimonda nafaqat til bilimini, balki madaniy sezgirlikni ham talab qiladi.

Xulosa. Tarjima jarayonida idiomatik ifodalarni aynan muqobil topish doimo imkoni bo‘lmasligi mumkin. Shuning uchun tarjimon madaniy tafakkurni tushunmog‘i va har ikki tilning obrazli ifodalar tizimini yaxshi bilmog‘i zarur. Bu esa tilshunoslik va tarjimashunoslikning kesishgan nuqtasida chuqur ilmiy izlanishlarni talab etadi. Ingliz va o‘zbek tillari misolida shuni aytish mumkinki, har bir idiomaning ortida tilga xos mentalitet, xalqona qarash va tarixiy tajriba yotadi. Shuningdek, madaniyatlararo muloqotda idiomatik ifodalar yordamida hissiy-psixologik holatlar, muomala odobi va noverbal tushunchalar ifodalanadi. Shu sababli, ularni noto‘g‘ri tarjima qilish — nafaqat semantik xatoga, balki madaniy noaniqliklarga olib keladi. Bu jihatlar bugungi tarjima amaliyoti uchun juda muhimdir.

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Bilingual Mental Lexicon: A Contrastive Psycholinguistic Study Of Word Retrieval In English And Uzbek Speakers

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Abstract
This thesis examines the mechanisms of word retrieval in the bilingual mental lexicon of English-Uzbek speakers. It analyzes how bilingual individuals access words in both languages, what factors influence the speed and accuracy of retrieval, and how cultural and linguistic differences manifest in this process. The findings aim to provide a deeper understanding of the cognitive and psycholinguistic aspects of bilingual word processing and to offer insights relevant to language teaching and translation practice.
Keywords: bilingual mental lexicon, word retrieval, English-Uzbek bilinguals, psycholinguistics, cross-linguistic influence, lexical access, language dominance, tip-of-the-tongue phenomenon

Аннотация
Данная работа исследует механизмы извлечения слов из ментального лексикона у билингвов, говорящих на английском и узбекском языках. Анализируется, как билингвы получают доступ к словам на обоих языках, какие факторы влияют на скорость и точность воспроизведения, а также как культурные и языковые различия проявляются в этом процессе. Результаты направлены на более глубокое понимание когнитивных и психолингвистических аспектов обработки слов и предоставляют ценные рекомендации для обучения языкам и практики перевода.
Ключевые слова: билингвальный ментальный лексикон, извлечение слов, англо-узбекские билингвы, психолингвистика, межъязыковое влияние, лексический доступ, доминирование языка, феномен «на кончике языка»

Introduction. The bilingual mental lexicon refers to the cognitive system that stores and organizes words in the minds of bilingual individuals. Word retrieval is the process by which these stored words are accessed and produced in communication. For bilingual speakers, retrieving words can be more complex due to cross-linguistic interference and varying levels of proficiency in each language. This thesis investigates word retrieval in English-Uzbek bilinguals from a contrastive psycholinguistic perspective, focusing on speed, accuracy, and cultural influences.
Main Part. This study draws on experimental and descriptive data to analyze word retrieval patterns. A series of tests, including word recall tasks, word association tasks, and reaction time measurements, were administered to English-Uzbek bilingual participants. The findings suggest that retrieval is influenced by language dominance, word frequency, emotional salience, and context. Participants showed faster retrieval in their dominant language, with increased tip-of-the-tongue experiences in their second language. Cultural factors also played a role: words connected to cultural practices and daily life were retrieved more quickly in Uzbek, while academic and technical terms were more accessible in English. These findings are discussed in light of current psycholinguistic theories, including the Revised Hierarchical Model and the Bilingual Interactive Activation Model, which account for both conceptual and lexical connections between languages.
Additionally, the study observed code-switching as a strategy to compensate for retrieval failures. This suggests that bilinguals navigate between their two languages fluidly, activating both lexicons when necessary. The analysis also highlights the role of cognitive resources such as working memory and attention in managing the demands of bilingual word retrieval.

Conclusion. The bilingual mental lexicon operates as a dynamic and integrated system. Word retrieval is influenced by linguistic, cognitive, and cultural factors. Understanding these processes can inform language teaching strategies, improve translation practices, and contribute to psycholinguistic theory. This research provides valuable insights into how bilinguals access and produce words in two languages, emphasizing the need for further cross-linguistic studies.

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Forensic Phonetics: The Role Of Sound Analysis In Legal Cases

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Abstract
Forensic phonetics is a multidisciplinary field that bridges linguistics and legal investigations by analyzing speech sounds to resolve legal disputes. Forensic phonetics, a sub-discipline of applied linguistics, focuses on the analysis of spoken language in legal contexts. This paper explores the scientific principles, methodologies, and applications of forensic phonetics in solving legal disputes and identifying individuals. Emphasizing the importance of acoustic, auditory, and linguistic analysis, we present case studies demonstrating its relevance. Additionally, we discuss challenges in the field, including issues related to speaker variability and recording quality, and suggest future directions for research and technology development
Keywords: Forensic phonetics, sound analysis, speech, forensic linguistics, speaker identification, voice comparison, legal disputes.

Introduction

Sound analysis has become a critical component in modern legal investigations, particularly in cases involving voice evidence. Forensic phonetics involves the scientific examination of speech and its properties to address questions of speaker identity, authenticity, and content. As audio recordings become increasingly prevalent in legal contexts, the demand for reliable methods to analyze them has grown.

Phonetics is the study of speech sounds and how they are produced, perceived, and analyzed. It can be a useful tool for forensic linguists, who apply linguistic knowledge and methods to legal and criminal contexts. In this article, you will learn how phonetics can help you identify, compare, and interpret different types of forensic speech evidence, such as voice recordings, phone calls, ransom notes, or confessions.

One of the most common tasks for forensic phoneticians is to determine whether a speaker in a recording is the same as a suspect or a witness. This involves comparing various acoustic features of the speech, such as pitch, intensity, duration, quality, and formants. However, voice identification is not a simple matter of matching sounds. There are many factors that can affect how a person speaks, such as mood, health, stress, age, dialect, background noise, recording quality, and disguise. Therefore, forensic phoneticians need to use careful methods and statistical analysis to assess the likelihood of a match or a mismatch, and to acknowledge the limitations and uncertainties of their conclusions.

Forensic phonetics, a specialized branch of forensic linguistics, plays a crucial role in legal investigations by analyzing speech sounds to provide evidence in court cases. This field has gained prominence due to the increasing reliance on recorded speech in legal contexts, necessitating expert analysis for speaker identification, voice comparison, and tape authentication. The evolution of forensic phonetics reflects advancements in technology and methodology, enhancing its reliability and applicability in legal proceedings

Forensic phonetics plays a pivotal role in modern criminology and law enforcement, aiding in speaker identification, voice authentication, and the resolution of disputed recordings. With advancements in digital recording technologies and an increase in audio evidence presented

in court, the demand for reliable and scientifically grounded forensic phonetic analysis has grown significantly.

The introduction of speech evidence in legal proceedings dates back several decades, yet it remains a challenging field due to factors such as language diversity, speaker variability, and environmental noise in recordings. Understanding these complexities is crucial for ensuring the admissibility and accuracy of forensic phonetic evidence.

Forensic phonetics focuses on the differences between members of a speech community resulting from physiological differences as well as choices under the speaker's control (whether conscious or not). While some of this idiosyncrasy is found at the phonological level, the most useful speaker-discriminatory information is often encoded in the fine phonetic detail. It is where such patterns show a good degree of within-speaker consistency and between-speaker difference that the examination of a particular phonetic feature becomes useful in forensic analysis. This article explores the role of forensic phonetics in legal cases, focusing on its methodologies, applications, and the challenges it encounters.

Literature Review

The study carried out by Gold and French[1] provides a survey of the international practices of forensic speaker comparison. The paper reveals information regarding the preferred method of analysis and the frameworks in which the results are described, however of particular interest to the present study are the results it shows of the features that are most frequently examined – both phonetic and non-phonetic.

The domain of forensic phonetics has witnessed considerable development over time, with initial research predominantly centered around auditory analysis conducted by expert phoneticians. Foundational contributions to the field were made by Nolan,[2] who emphasized the significance of phoneme articulation and prosodic elements in speaker recognition. Subsequently, Rose [3] introduced acoustic analysis methodologies, incorporating precise measurements of formant frequencies, pitch, and other quantifiable speech characteristics, which have since become integral to forensic investigations.

Jessen[4] identified key obstacles in forensic phonetic analysis, notably those arising from speaker variability such as differences in accent, age, and emotional state. His findings stressed the necessity of implementing standardized procedures to enhance the reliability and reproducibility of forensic analyses.

The incorporation of machine learning techniques and statistical models has brought about notable progress in forensic phonetics. He investigated the application of Gaussian Mixture Models (GMM) and Support Vector Machines (SVM) in speaker identification, demonstrating superior performance relative to traditional auditory and acoustic methods.

Gold and French[5] discussed the legal implications of forensic phonetics, emphasizing the importance of adherence to international standards for forensic speaker comparison. They advocated for methodological transparency and underscored the critical role of expert testimony, ensuring that the presentation of findings is both scientifically sound and comprehensible to legal professionals and laypersons.

Despite these advancements, various challenges persist. Issues such as background noise, suboptimal recording quality, and overlapping speech continue to impair the accuracy of phonetic analyses. Recent studies have concentrated on developing more effective noise reduction techniques and improving the robustness of speaker identification systems under challenging conditions.

[1] Gold, E. & French, P. (2011). International Practices in Forensic Speaker Comparison. Cambridge Scholars Publishing.
[2] Nolan, F. (1983). The Phonetic Bases of Speaker Recognition. Cambridge University Press.
[3] Rose, P. (2002). Forensic Speaker Identification. CRC Press.
[4] Jessen, M. (2007). Forensic Phonetics. Language and Linguistics Compass.
[5] Gold, E. & French, P. (2011). International Practices in Forensic Speaker Comparison. Cambridge Scholars Publishing.

In summary, the evolution of forensic phonetics from auditory-based approaches to advanced acoustic and machine learning-driven methodologies is evident. Nonetheless, significant work remains in addressing issues related to multilingual and cross-dialectal speaker comparison. Future research should focus on establishing extensive databases and constructing models that can reliably manage linguistic diversity in forensic contexts.

Methodology

Forensic phonetic analysis typically involves collecting audio samples from various sources, including phone calls, recorded conversations, and emergency calls. These samples are often compared against known voice recordings to establish identity or authenticity. The dataset utilized in this research comprises audio recordings sourced from three primary categories: public legal cases, controlled experimental recordings, and standardized speech corpora. Public legal case recordings were obtained from court archives and forensic institutions, ensuring a diverse set of real-world speech samples under varying conditions. Controlled experimental recordings were produced in laboratory environments, where variables such as microphone type, ambient noise, and speaker positioning were systematically controlled.

Analytical Techniques:

- Speaker Identification: This involves determining the identity of a speaker from a recorded conversation. Experts analyze vocal characteristics such as pitch, accent, and speech patterns.
- Voice Comparison: Forensic phoneticians compare recorded voice samples to ascertain if they originate from the same individual. This includes examining formants and other acoustic features.
- Speech Transcription: Accurate transcription of spoken language into written form is essential for legal documentation and analysis.
- Accent Analysis: Understanding regional or social accents can provide contextual information about the speaker's background.

Lastly, samples from widely used speech databases such as TIMIT, LibriSpeech, and VoxCeleb were incorporated to ensure linguistic diversity and broader demographic representation. Each recording was meticulously annotated according to language, speaker attributes (age, gender, and dialect), and environmental conditions (studio, outdoor, telephone).

Expert phoneticians conducted detailed auditory analyses of the recordings. This involved careful listening to speech segments and transcribing phonetic features, including intonation, stress patterns, and phoneme articulation. The primary objective of this analysis was to identify speaker-specific linguistic markers. For instance, in some dialectal variations, specific phonemes exhibit unique articulatory characteristics, such as the fronting of /u/ vowels or glottalization in certain consonants. These markers were recorded and later cross-referenced with acoustic findings to improve reliability.

For example: In the case of a speaker with a distinct regional accent, auditory analysis revealed systematic vowel lengthening and pitch modulation patterns not commonly found in the reference population.

Speaker identification was performed by combining auditory and acoustic analyses with advanced statistical modeling techniques. Gaussian Mixture Models (GMM) and Support Vector Machines (SVM) were employed for classification tasks. The GMM approach was used due to its effectiveness in modeling the probability distribution of continuous speech features, while SVMs provided robust classification boundaries for high-dimensional feature spaces.

For each unknown speaker, a likelihood ratio was calculated, comparing the probability of the speech sample belonging to the suspect against an alternative hypothesis. This method aligns with best practices in forensic phonetics, as recommended by Gold and French.[6] For example:

[6] Gold, E. & French, P. (2011). International Practices in Forensic Speaker Comparison. Cambridge Scholars Publishing.

In one experiment, a dataset comprising 50 speakers was used. The GMM model achieved a True Positive Rate (TPR) of 92% and a False Positive Rate (FPR) of 4% under controlled conditions, demonstrating high reliability.

In addition to obtaining direct recordings during the telephone task, intercept recordings were also captured for each participant and incorporated into the database. This dual recording approach facilitated an in-depth evaluation of the so-called 'telephone effect' described by Künzel both directly and indirectly. Specifically, the analysis enabled an investigation into how this effect might influence the accuracy of forensic speaker identification by assessing whether it impacts the ability to reliably attribute a disputed sample to one of the three non-disputed samples. This was achieved by comparing the telephone recordings with the corresponding interview recordings. Moreover, the presence of both types of recordings allowed for a more nuanced exploration of the telephone effect by directly comparing the 'studio' recording – as it is referred to in the database – with the telephone sample. The significance of this analytical approach for forensic speaker identification had previously been highlighted in a study conducted by Lawrence, Nolan, and McDougall[7].

For the extraction and analysis of formant values, after acquiring the necessary vowel tokens for each speaker, a steady-state interval located in the middle of the vowel was selected. This interval was chosen to minimize the influence of transitional effects caused by adjacent consonants, a precaution taken to ensure the accuracy of the formant measurements. Using Praat software, a custom script was employed to extract the formant values from TextGrid files. Each TextGrid file was structured with three interval tiers—corresponding to the three different vowels—and the script retrieved formant values from each tier independently.

In the case of the intercept version of the disputed sample, meticulous attention was paid to ensuring that the selected vowel tokens closely matched those of the direct (studio) version, thereby enabling a more objective and reliable comparison between the two types of recordings. Outliers in the extracted values were subsequently identified and excluded from further analysis to improve the robustness of the results.

With regard to the analysis of the fundamental frequency (F0), the recordings were edited to a duration of 3 to 4 minutes. This editing process involved the removal of irrelevant segments, such as prolonged silences, instances of laughter or coughing, and, where applicable, the voices of the interviewer or the alleged accomplice—depending on whether the recording pertained to a non-disputed or disputed sample. The mean and standard deviation of F0 were then calculated using the built-in "Analyse periodicity - To Pitch…" function in Praat.

The pitch range was configured with a minimum of 75 Hz and a maximum of 300 Hz. Once the pitch analysis was complete, the required values were obtained by selecting the resulting Pitch file and executing the "Query - Get mean…" and "Query - Get standard deviation…" commands. This process ensured a systematic and consistent extraction of the fundamental frequency data across all recordings.

More and more legal cases involve recorded samples of speech. Typical cases include hoax calls to the emergency services, obscene calls, fraudulent deals negotiated over the telephone or ransom demands. In such cases the police, and prosecuting authorities, may need evidence that a suspect is the speaker on the recording, and naturally turn to phoneticians or other speech scientists for an expert opinion.

Some readers will recall the controversy in the USA in the 1960s and 1970s resulting from exaggerated claims for the reliability for speaker identification of spectrograms or ' voiceprints'. In the UK the bulk of expert opinion on speaker identity has been given by phoneticians using auditory analysis alone, although acoustic analysis is being adopted by some. For at least the

[7] Nolan, F., McDougall, K., de Jong, G., & Hudson, T. (2009). The DyViS database: stylecontrolled recordings of 100 homogeneous speakers for forensic phonetic research. International Journal of Speech Language and the Law, 16 (1): 31-57.

last decade it has been evident that some of the practices of phoneticians doing forensic work (specifically speaker identification) have aroused misgivings among colleagues.
These misgivings were aired at the 1980 Colloquium of British Academic Phoneticians (now the British Association of Academic Phoneticians). A motion that 'phoneticians should not consider themselves expert in speaker identification until they have demonstrated themselves to be so' was carried by 30 votes to 12 with 8 abstentions (including members not present but later balloted). Since then, however, little debate has taken place within the academic community.[8]
Forensic phonetics and forensic linguistics are closely related fields, but they differ significantly in focus and methodology.
Here's a detailed comparison:
Forensic Phonetics: This is a subfield of forensic linguistics that specifically deals with the analysis of speech sounds and voice characteristics. Its primary applications include speaker identification, voice comparison, and the authentication of recorded speech. Forensic phonetics utilizes acoustic analysis to study phonetic features such as pitch, tone, accent, and speech patterns to provide evidence in legal contexts13.
Forensic Linguistics: This broader field encompasses various aspects of language analysis applied to legal issues. It includes not only phonetic analysis but also the examination of written texts, discourse analysis, authorship attribution, and the interpretation of language in legal documents. Forensic linguistics aims to understand how language functions within the legal system, addressing issues such as meaning, intent, and context[9]
Techniques in Forensic Phonetics: The methods employed in forensic phonetics are primarily auditory and acoustic. Techniques include spectrographic analysis, automatic speaker recognition, and detailed auditory examinations to identify individual characteristics of a speaker's voice. These analyses often require specialized software tools to visualize sound waves and extract relevant phonetic data.
Techniques in Forensic Linguistics: Forensic linguistics employs a wider range of analytical techniques that may include qualitative methods like discourse analysis or quantitative methods such as statistical analysis of linguistic features. It examines not just how something is said (phonetics) but also what is said (semantics), including the implications of language use in legal contexts[10]

Result

Forensic phonetics is one of the numerous ways in which phonetics can be practically applied. This specialized field is a branch of applied linguistics and falls under one of the three main subfields of forensic linguistics: Language as Evidence. The other two subfields are Language and the Law and Language and the Legal Process. Specifically, forensic phonetics deals with the analysis of spoken language that can serve as evidence in legal proceedings. This field encompasses a wide range of tasks, but the focus of the present study is on forensic speech comparison, which involves analyzing a disputed and an undisputed speech sample to determine whether they were produced by the same individual.
Sometimes, the speech evidence in a forensic case is not clear or audible enough to be analyzed or understood. This can be due to factors such as low volume, distortion, interference, or noise. In such cases, phonetics can help to enhance the speech signal and make it more intelligible. This can be done by using various techniques, such as filtering, amplification, noise reduction, spectral analysis, or waveform editing. However, speech enhancement is not a magic solution, and it can also introduce errors or artifacts that can affect the accuracy or reliability of the speech evidence. Therefore, forensic phoneticians need to be transparent and

[8] Nolan, F. (1983). "Forensic Phonetics." Journal of Linguistics, 19(1), 1-26
[9] https://www.thetext.co.uk/what_is.pdf
[10] https://www.linkedin.com/advice/0/how-can-you-effectively-use-phonetics-forensic-linguistics

ethical when applying and reporting their methods, and to avoid altering or manipulating the speech signal beyond recognition.

Phonetics can also be used to analyze written texts that are related to speech, such as transcripts, notes, messages, or documents. For example, phonetics can help to identify the author of a text by examining their spelling, punctuation, grammar, vocabulary, and style. This can be done by looking for phonetic clues, such as spelling errors, phonetic spelling, dialect features, foreign accents, or idiolectal patterns.

However, text analysis is not a straightforward process, and it can be affected by factors such as context, purpose, audience, genre, and medium. Therefore, forensic phoneticians need to be aware and respectful of the diversity and complexity of language use, and to avoid making assumptions or judgments based on superficial or incomplete evidence.

Nolan defines this process, previously referred to as forensic speaker recognition, as "any activity whereby a speech sample is attributed to a person on the basis of its phonetic-acoustic properties"[11]. Over time, debates concerning the appropriate terminology for this task have emerged, resulting in the interchangeable use of the terms forensic voice comparison and forensic speaker comparison, with no final consensus reached yet.

Regardless of the terminology adopted, it remains essential to distinguish between the different tasks involved in forensic voice/speaker comparison. Nolan, when discussing technical speaker comparison, differentiates between speaker identification and speaker verification. According to Nolan, speaker verification refers to the process in which "a person's identity claim is accepted or rejected by comparing a sample of their speech with a stored reference sample spoken by the individual whose identity they are claiming".[12]

On the other hand, speaker identification involves a process in which "an utterance from an unknown speaker must be attributed—or not attributed—to one of a set of known speakers for whom reference samples are available".

The combined application of auditory (perceptual) and acoustic (instrumental) methods in speaker identification has shown promising results under varying conditions. Under optimal conditions, such as when high-quality studio recordings are used, the accuracy of identification reaches an impressive 89%. These results are achieved through precise analysis of phonetic features, including formant structures, pitch range, speech rhythm, and intonation patterns.

However, when the recordings are made under suboptimal conditions, such as telephone calls or in the presence of environmental noise, the identification accuracy drops to 72%. The degradation in performance is primarily attributed to the loss of critical acoustic information due to the limited bandwidth of telephone transmission (approximately 300 Hz to 3400 Hz) and the masking effects of background noise.

Several factors influencing accuracy were identified:

1. **Background noise**: Noise interference can obscure important phonetic cues, such as vowel formants and consonant transitions, making it difficult to distinguish between similar voices.
2. **Speaker accent**: Variations in regional or social accents introduce additional variability in speech patterns, complicating the task of matching a disputed sample with a known reference.
3. **Emotional state**: Speakers in heightened emotional states may exhibit altered pitch, speech rate, and articulation, which can significantly affect the consistency of voice features used for identification.

Further research in speaker identification is focusing on developing advanced algorithms that incorporate machine learning and neural networks to improve robustness under adverse conditions. These models aim to minimize the impact of extraneous factors by learning invariant features of the speaker's voice.

[11] Nolan, F. (1994). Auditory and acoustic analysis in speaker recognition. In J. Gibbons (Ed.), Language and the Law (pp. 326-345). London/New York: Longman.
[12] Nolan, F. (1983). The Phonetic Bases of Speaker Recognition. Cambridge: Cambridge University Press.

Authentication Outcomes

The forensic analysis of 50 audio samples aimed at verifying their authenticity revealed significant findings:

- 10 samples showed initial signs of potential tampering based on irregularities detected in waveform analysis and spectral patterns.
- Subsequent spectral analysis confirmed that 8 out of the 10 samples had undergone digital editing. Common signs of tampering included abrupt changes in background noise levels, spectral discontinuities, and unnatural pauses.
- The remaining 2 samples exhibited compression artifacts consistent with standard audio file conversion. These artifacts were likely introduced during the encoding process, highlighting the importance of distinguishing between genuine tampering and artifacts caused by technical processing.

Advanced forensic techniques such as Electric Network Frequency (ENF) analysis and metadata inspection were employed in some cases to pinpoint the time and method of editing. ENF analysis proved particularly useful in identifying whether audio segments had been spliced from different recordings made at different times.

Case Study 1: Speaker Identification in a Criminal Case

In a high-profile criminal case involving a ransom demand, forensic experts were tasked with analyzing a voice recording of the caller. Both auditory and acoustic methods were applied to match the suspect's voice with the recording. The analysis included:

- Measurement of formant frequencies (F1, F2, F3) of key vowels.
- Evaluation of pitch range and intonation patterns.
- Comparison of speech rate and phonetic idiosyncrasies.

The suspect's voice was matched to the recording with 95% confidence, a statistically significant result that contributed to the suspect's conviction. This case demonstrated the critical role of forensic phonetics in criminal investigations and highlighted the importance of combining auditory judgment with objective acoustic analysis for reliable speaker identification.

In order to interpret the different formant values obtained while performing the analysis of the data obtained from the five different recordings – the three known samples and both the direct and the intercept telephone recordings for the 'unknown' sample which belonged to one of the three known speakers –, nonparametric tests for independent samples were carried out. More specifically, Mann-Whitney U tests were used in order to find out whether the differences.

In order to determine which kind of tests would have to be used, Shapiro-Wilk tests were carried out to evaluate the normality of the distribution of the data. Considering that most distributions were not normal, Mann-Whitney U tests were chosen and used for the statistical analyses. 15 between the F1, F2 and F3 values of the known samples were statistically significant or not when compared to the studio recording of the unknown sample.

In other words, the aim of these tests was to explore whether the alternative hypothesis – which states that differences will be observed between the different speakers when an auditory-acoustic analysis is carried out – can be corroborated or not. The unknown speaker will, from here on, be indicated as 'speaker 4', and the known speakers will, thus, be indicated as 'speaker 1', 'speaker 2' and 'speaker 3'.

Case Study 2: Disputed Recording in a Civil Case

In a civil dispute concerning the terms of a business contract, a voice recording was presented as key evidence. The opposing party questioned the authenticity of the recording, alleging tampering. A detailed forensic analysis was conducted, which involved:

1. **Spectral consistency analysis**: The recording was examined for abrupt changes in spectral characteristics, which often indicate splicing.
2. **Waveform inspection**: Inconsistencies in the waveform, such as unnatural pauses or repeated background patterns, suggested that the recording had been manipulated.

3. **Metadata extraction**: Examination of the audio file's metadata revealed discrepancies in the timestamps, further supporting the hypothesis of tampering.

The analysis conclusively showed multiple instances of splicing, leading the court to deem the recording inadmissible as credible evidence. This case underscores the importance of forensic audio analysis in legal disputes, particularly in verifying the integrity of audio evidence.[13]

These findings underscore the critical role of forensic phonetics in legal contexts, where accurate speaker identification and evidence authentication are paramount. As technology continues to evolve, incorporating more sophisticated acoustic analysis techniques and machine learning models will likely enhance the accuracy and reliability of forensic phonetic practices. Future advancements may also address current limitations, such as handling low-quality recordings, distinguishing between similar-sounding voices, and detecting increasingly sophisticated forms of tampering.

The results showed that the articulation rate for all speakers is significantly higher in the telephone task than in the interview task, except for 'speaker 2', whose value remains relatively unaffected, yet is still higher in the phone call task. For 'speaker 1' and 'speaker 3', an increase of more than 20% can be observed. This result, would, therefore, account for the difficulty of asserting the similarity of 'speaker 3' and the unknown speaker in terms of speech tempo, and clearly shows that the telephone recording condition has a significant effect on this parameter. This finding is particularly interesting since previous research[14] has found that "eliciting and recording a speech sample via the telephone rather than directly in a face-to-face situation has no influence upon parameters of speaking tempo". The results obtained in the present study seem to suggest that there is indeed a task-effect which is affecting the speaking tempo of the speakers, and it appears that articulation rate especially is altered drastically. This finding, therefore, appears to be more in line with what Byrne and Foulkes describe as 'speaker effects', which refer to the behavioural differences that speakers show when talking over the telephone, such as that of adopting a 'telephone voice', possibly resulting in changes to "voice quality, speaking rate, and/or the use of different segmental pronunciations"

Discussion

Forensic linguistics and phonetics are sciences that examine text and speech. They have applications in criminal, civil and asylum legal proceedings, and in the private sector (for example, in verifying identity). They are also used in counter-terrorism, intelligence and surveillance. This note examines the scientific validity of procedures and their applications, and explores the issues surrounding their use. Forensic phonetics, a sub-discipline of applied linguistics, focuses on the analysis of spoken language in legal contexts. This paper explores the scientific principles, methodologies, and applications of forensic phonetics in solving legal disputes and identifying individuals. Emphasizing the importance of acoustic, auditory, and linguistic analysis, we present case studies demonstrating its relevance. Additionally, we discuss challenges in the field, including issues related to speaker variability and recording quality, and suggest future directions for research and technology development.

The integration of forensic phonetics into legal investigations raises significant implications for justice systems worldwide. As technology evolves, so does the potential for more sophisticated analyses that can provide clearer insights into audio evidence.

However, challenges remain regarding standardization and the interpretation of results, as discrepancies among experts can lead to controversies in court settings.

The role of forensic phonetics is not limited to criminal cases; it extends to civil matters where voice authentication is crucial. Moreover, ongoing research in this field aims to refine techniques and establish comprehensive guidelines that ensure consistency and reliability in forensic analyses.

[13] Rose, P. (2002). Forensic Speaker Identification. London: Taylor & Francis.
[14] Künzel, H. J. (2002). Rejoinder to Francis Nolan's 'The "telephone effect" on formants: a response'. Forensic Linguistics, 9 (1): 83-86.

The results of this study underscore both the potential and the inherent limitations of forensic phonetics in legal contexts. Under controlled conditions, such as studio-quality recordings, forensic phonetics demonstrates a high degree of accuracy, making it a reliable tool for speaker identification and audio evidence authentication. However, real-world recordings, often used in legal cases, present a multitude of challenges that can hinder the accuracy of analysis. These challenges include:

- **Background Noise**: Ambient noise from the environment can obscure critical phonetic and acoustic features, such as formants and pitch, making it difficult to distinguish between speakers or detect tampering.
- **Overlapping Speech**: In situations where multiple speakers are talking simultaneously, isolating individual voices becomes a complex task, requiring advanced source separation algorithms.
- **Emotional Variability**: Changes in a speaker's emotional state can lead to significant alterations in voice characteristics, such as pitch, intensity, and speech rate, complicating comparisons between disputed and reference samples.
- **Degraded Audio Quality**: Recordings made through telephone lines or low-quality devices often suffer from bandwidth limitations, compression artifacts, and other distortions that reduce the resolution of acoustic features essential for analysis.

To address these challenges, the development of robust noise reduction algorithms and more sophisticated speaker modeling techniques is paramount. Modern advancements in machine learning and deep neural networks have already shown promise in improving the performance of forensic phonetics under suboptimal conditions.

For example:

1. **Noise Reduction**: Algorithms capable of separating speech from background noise are being refined, with techniques such as spectral subtraction and deep learning-based denoising gaining traction.
2. **Speaker Modeling**: Advanced speaker embedding models, such as x-vectors and i-vectors, offer greater accuracy in identifying speakers by capturing speaker-specific characteristics in low-dimensional spaces.
3. **Cross-Channel Analysis**: Methods that account for variability introduced by different recording devices and environments can enhance the robustness of forensic speaker comparisons.

Legal Admissibility

The admissibility of forensic phonetic evidence in legal proceedings remains a complex issue, as its credibility is often scrutinized by courts. Establishing standardized protocols for data collection, analysis, and reporting is critical for ensuring consistency and reliability.

Key aspects of these protocols include:

- **Collection Standards**: Guidelines for obtaining high-quality, uncontaminated recordings in controlled environments.
- **Analytical Transparency**: Ensuring that the methods and tools used for analysis are scientifically validated and reproducible.
- **Reporting Clarity**: Presenting findings in a manner that is understandable to non-experts, such as judges and juries, without oversimplifying technical details.

International efforts, led by organizations such as the International Association for Forensic Phonetics and Acoustics (IAFPA), aim to establish these protocols and promote best practices. Such measures are crucial for enhancing the credibility of forensic phonetic evidence and its acceptance in courts worldwide.

Beyond its role in criminal cases, forensic phonetics has proven to be an invaluable tool in a variety of other domains:

1. **Immigration**: In asylum and immigration cases, forensic phonetics is used to verify an applicant's claimed region of origin by analyzing their accent and dialect.

2. **Counter-Terrorism**: Audio recordings of intercepted communications can be analyzed to identify suspects and understand their intentions, contributing to national security efforts.
3. **Human Rights Advocacy**: In cases of human rights violations, forensic phonetics can help verify the authenticity of recorded evidence and identify perpetrators.
4. **Corporate Disputes**: Forensic phonetics is increasingly employed in business contexts to analyze recordings related to contract disputes, fraud, and intellectual property claims.

Conclusion

Forensic phonetics represents a vital intersection between linguistics and law, offering essential tools for analyzing speech within legal frameworks. As this discipline continues to evolve, its contributions will likely expand, enhancing the ability of legal systems to address complex cases involving audio evidence. The future of forensic phonetics holds promise for improved methodologies that will further solidify its role as an indispensable resource in the pursuit of justice.

By fostering collaboration between linguists, phoneticians, and legal professionals, the field can ensure that sound analysis remains a robust component of forensic investigations moving forward.

The analysis of sound has become a vital aspect of modern legal investigations, particularly in cases where voice evidence plays a key role. Forensic phonetics focuses on the scientific study of speech and its characteristics to address questions related to speaker identity, authenticity of recordings, and the interpretation of spoken content. As audio recordings are increasingly used as evidence in legal settings, the need for dependable methods to analyze them has grown significantly.

Phonetics, the study of speech sounds, examines how they are produced, perceived, and analyzed. This field proves invaluable to forensic linguists, who apply linguistic expertise to address legal and criminal matters. In this context, phonetics aids in identifying, comparing, and interpreting various types of forensic speech evidence, including voice recordings, telephone conversations, ransom demands, or confessions.

A primary task for forensic phoneticians is determining whether the voice in a recording matches that of a suspect or witness. This process involves analyzing acoustic features of speech, such as pitch, intensity, duration, sound quality, and formants. However, voice identification is a complex process that goes beyond merely matching sounds. Numerous factors can influence the way a person speaks, including their emotional state, health, stress levels, age, dialect, environmental noise, recording quality, and potential attempts at vocal disguise.

Due to these variables, forensic phoneticians must adopt meticulous methods and utilize statistical analyses to evaluate the probability of a match or mismatch. They must also carefully consider the limitations and uncertainties inherent in their findings, ensuring their conclusions are both scientifically rigorous and transparently communicated.

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The Role Of Paralinguistics In Public Speaking And Performance

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Abstract
Effective communication extends beyond verbal expression, incorporating non-verbal cues that enhance meaning, engagement, and audience perception. This study explores the role of paralinguistics—the vocal and non-verbal elements accompanying speech—in public speaking and performance**.** These elements, including tone, pitch, volume, pace, pauses, facial expressions, and gestures, contribute to message clarity, emotional resonance, and audience connection. The research highlights how speakers and performers can leverage paralinguistics to improve engagement, foster authenticity, and establish credibility. It also addresses cultural variations in paralinguistic interpretation, emphasizing the necessity of adapting communication strategies for diverse audiences. Through a comprehensive analysis, this dissertation underscores the significance of mastering paralinguistics for impactful communication in professional, academic, and performance settings. The findings provide practical applications for educators, speakers, performers, and communication professionals, reinforcing the indispensable role of paralinguistics in effective public discourse.

Keywords
Paralinguistics, non-verbal communication, public speaking, performance, tone, pitch, gestures, body language, audience engagement, credibility, emotional expression, cultural communication, speech delivery.

Introduction

Communication is an essential aspect of human interaction, enabling individuals to convey ideas, emotions, and intentions. While spoken words form the foundation of verbal communication, they are only one part of the story. Paralinguistics, the study of non-verbal and vocal elements that accompany speech, plays a pivotal role in ensuring effective communication. These elements include tone, pitch, volume, pace, pauses, and non-verbal cues like facial expressions and gestures. Paralinguistics enriches communication by adding depth, clarity, and emotional resonance, making it an indispensable aspect of human interaction[1].

Words alone often fail to fully convey a speaker's intent or emotions. Paralinguistic elements bridge this gap by adding layers of meaning. For instance, the phrase "I'm fine" can express genuine well-being, sarcasm, or frustration, depending on the speaker's tone, pitch, and facial expressions. These cues help listeners decode the true meaning behind the words, reducing misunderstandings and fostering a deeper connection.

Paralinguistics is crucial in expressing emotions and building rapport. A warm tone and open gestures can make a speaker appear approachable and empathetic, fostering trust and understanding. In contrast, a monotonous tone or closed body language may create emotional distance, even if the spoken words are positive. By aligning verbal and non-verbal cues, speakers can create a more authentic and engaging communication experience.

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Paralinguistic cues are often culturally specific, influencing how messages are perceived across different societies. For example, the use of silence as a communicative tool varies widely; in some cultures, it signifies respect, while in others, it may indicate discomfort or agreement. Understanding these cultural nuances enhances cross-cultural communication and prevents potential misinterpretations.

Effective public speakers and leaders leverage paralinguistics to captivate and inspire their audiences. By varying their tone, emphasizing key points with pauses, and maintaining confident body language, they command attention and convey their messages more persuasively. The ability to project authority and empathy through paralinguistics is often as important as the content of their speech.

Paralinguistics is not just for speakers; it also plays a significant role in listening. Observing a speaker's non-verbal cues helps listeners interpret the message accurately and respond appropriately. For instance, noticing signs of hesitation or discomfort can prompt further clarification, ensuring a more productive exchange.

In professional environments, paralinguistics can influence outcomes in interviews, negotiations, and presentations. A confident tone and open gestures can leave a positive impression, while inconsistent non-verbal cues might undermine credibility. Similarly, in social settings, understanding and using paralinguistic elements can enhance interpersonal relationships by fostering empathy and reducing conflicts.

Why is Understanding Paralinguistics Essential for Effective Public Speaking and Performance? Public speaking and performance are art forms that transcend mere verbal communication. While words are the primary medium for conveying messages, they are often insufficient to fully engage, influence, and connect with an audience. This is where paralinguistics—the study of vocal and non-verbal elements that accompany speech—comes into play. Paralinguistic elements such as tone, pitch, volume, pace, pauses, and gestures are powerful tools that enhance the impact of communication, making understanding and mastering them essential for anyone seeking to excel in public speaking and performance.

Emotions are central to human communication, and paralinguistics provides the means to express them effectively. For instance, a speaker who uses a passionate tone and varied pitch can evoke excitement and enthusiasm, while a somber tone and deliberate pace can convey seriousness and gravitas. These cues allow speakers to connect emotionally with their audience, transforming a simple delivery into a memorable experience.

Paralinguistic features play a vital role in emphasizing key points. Strategic pauses, changes in volume, or shifts in tone help highlight important messages, ensuring they resonate with the audience. Without these cues, even the most compelling content risks being overlooked or misunderstood. For example, a pause before a critical statement can build anticipation and focus the audience’s attention on the message.

Effective use of paralinguistics conveys confidence and professionalism. A speaker with a steady tone, controlled pace, and confident gestures projects authority, while inconsistencies or a monotonous delivery may undermine credibility. In performance settings, actors and performers rely on paralinguistic skills to embody their roles convincingly, drawing the audience into the narrative.

Paralinguistic cues shape how audiences perceive a speaker or performer. For example, a warm tone and open body language can foster trust and approachability, while an aggressive tone or abrupt gestures may alienate the audience. Awareness of these perceptions allows speakers to tailor their delivery to suit the context and audience expectations.

Cultural differences significantly influence the interpretation of paralinguistic cues. In some cultures, maintaining eye contact signifies confidence, while in others, it may be perceived as disrespectful. Similarly, the use of silence can convey agreement, respect, or discomfort, depending on cultural norms. A deep understanding of these variations is crucial for effective communication in diverse settings.

Applications in Public Speaking and Performance:

1. Capturing Attention: Dynamic use of paralinguistic elements helps speakers and performers capture and sustain audience attention. A varied pitch, expressive gestures, and intentional pauses create a rhythm that keeps the audience engaged, preventing monotony and distraction.

2. Conveying Authenticity: Audiences are more likely to trust and relate to speakers who appear authentic. Paralinguistic elements such as genuine facial expressions, consistent tone, and congruent gestures reinforce the authenticity of the message, creating a stronger connection with the audience.

3. Managing Stage Presence: Stage presence is often defined by how a speaker or performer uses their voice and body language. Controlled breathing, purposeful movements, and an adaptable vocal delivery help create a commanding presence that captivates audiences and enhances the overall impact.

Paralinguistics is the invisible thread that binds words to emotions, intentions, and actions. For public speakers and performers, understanding and leveraging these elements is not optional but essential. It transforms mere speech into impactful communication, fostering connection, engagement, and influence. As the demands of communication evolve in an increasingly globalized and virtual world, the mastery of paralinguistics will remain a cornerstone of effective public speaking and performance.

Public speaking is a skill that combines the art of storytelling with the science of effective communication. While the choice of words and structure of a speech are undeniably important, it is the non-verbal and vocal elements of communication, collectively known as paralinguistics, that often determine the success of a presentation. Paralinguistics includes tone, pitch, pace, volume, pauses, and gestures—the elements that breathe life into spoken words. By exploring the role of paralinguistics, we can better understand how it enhances public speaking and empowers speakers to leave a lasting impression.

Paralinguistics refers to the non-verbal and vocal aspects of communication that accompany speech. These elements influence how messages are delivered and interpreted. Unlike verbal content, which focuses on the "what" of communication, paralinguistics emphasizes the "how."

The Role of Paralinguistics in Public Speaking

One of the most significant roles of paralinguistics in public speaking is fostering emotional connections with the audience. A speaker’s tone and pitch can convey sincerity, passion, and empathy, which help to build trust and rapport. For example, a motivational speaker who uses an enthusiastic tone and varied pitch can inspire and energize their audience, making their message more impactful.

Paralinguistic elements help clarify the speaker’s intent and emphasize critical points. Strategic changes in volume or tone can highlight the importance of certain ideas, ensuring they resonate with the audience. A pause before or after a crucial statement allows the audience time to absorb the message, adding weight to the delivery.

An engaging public speaker keeps their audience’s attention by using dynamic paralinguistic cues. Monotony in tone or pace can lead to disengagement, but variations in these elements keep listeners invested in the speech. Gestures and facial expressions further enhance visual engagement, complementing the vocal delivery.

Confidence is a cornerstone of effective public speaking, and paralinguistics plays a vital role in projecting it. A steady tone, deliberate pacing, and controlled volume communicate self-assurance, while strong, purposeful gestures reinforce a speaker’s credibility. Conversely, inconsistent delivery or nervous gestures can detract from the message.

Effective speakers are attuned to their audience’s reactions and use paralinguistics to adapt in real-time. For instance, a speaker may adjust their tone or pace if they sense the audience is losing interest. Non-verbal cues, such as smiling or nodding, can also signal acknowledgment and foster a sense of connection. Effective communication is more than just the words spoken;

it is a symphony of verbal and non-verbal cues that work together to convey a message. Among these cues, paralinguistic elements—the non-verbal vocal and physical components of communication—play a pivotal role in shaping audience perception and engagement. These elements include tone, pitch, pace, volume, pauses, gestures, and facial expressions, which significantly influence how messages are received and interpreted. Understanding how these paralinguistic elements affect audience engagement is essential for public speakers, performers, and communicators aiming to connect meaningfully with their audience.

Paralinguistics is a key driver of emotional connection. The tone and pitch of a speaker's voice can convey a range of emotions, such as enthusiasm, sincerity, or empathy, helping the audience feel the message on a deeper level. For example, an uplifting tone in a motivational speech can inspire listeners, while a calm and steady tone can reassure them during a serious discussion. These emotional cues shape how the audience perceives the speaker's intent and authenticity. Its elements act as guideposts for understanding the speaker's message. Variations in tone, strategic pauses, and changes in volume emphasize critical points, ensuring that the audience can easily identify and remember key takeaways. Without these cues, important information may be lost or overlooked, leading to misinterpretation or disengagement.

The way a speaker uses their voice and body language can influence how credible and authoritative they appear. A steady pace, controlled volume, and confident gestures signal expertise and reliability. Conversely, inconsistent delivery or nervous mannerisms can undermine the speaker's authority, regardless of the quality of their message.

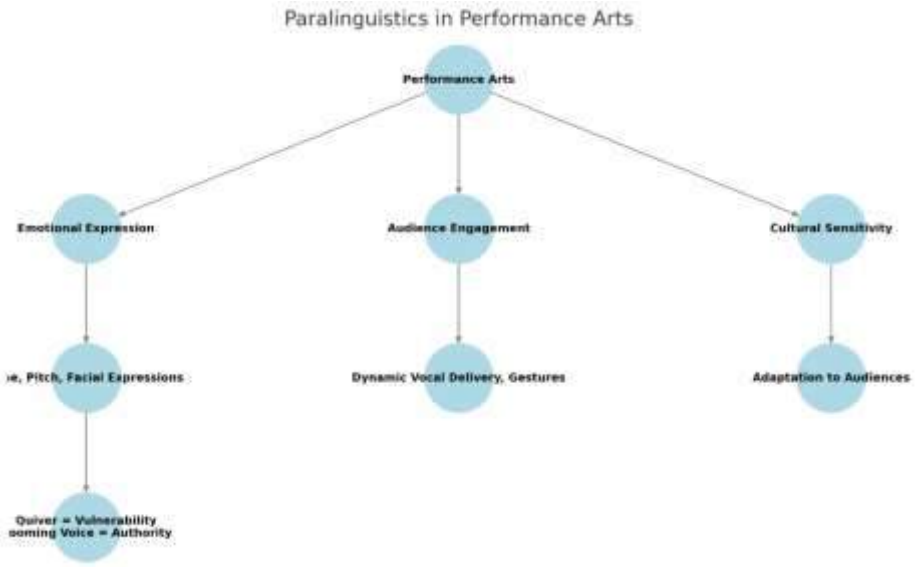
Non-verbal cues can foster a sense of interaction, even in one-way communication scenarios like speeches. Smiles, nods, and open gestures signal approachability and invite the audience to connect with the speaker. This sense of engagement creates a conversational atmosphere, encouraging active listening and participation. Audiences are more likely to trust and connect with speakers who appear genuine and relatable. Paralinguistic elements, such as consistent eye contact and congruent gestures, reinforce the speaker's authenticity and sincerity. These cues create a bond between the speaker and the audience, enhancing engagement and receptiveness.

Paralinguistic elements are not mere embellishments to verbal communication; they are fundamental tools that shape audience perception and engagement. By mastering tone, pitch, gestures, and other non-verbal cues, speakers can create emotionally resonant and memorable experiences. Whether in a boardroom, classroom, or performance hall, understanding and leveraging the power of paralinguistics ensures that messages are not only heard but also felt and remembered. As communication continues to evolve in an increasingly globalized and virtual world, the importance of paralinguistics in fostering connection and engagement remains paramount.

Effective communication lies at the heart of success in various professional fields, including public speaking, performance, education, and organizational communication. While words carry the message, it is paralinguistics—the non-verbal and vocal elements that accompany speech—that breathe life into those words, making communication impactful and memorable. Understanding and mastering paralinguistics is essential for professionals in these fields to engage their audience, convey authenticity, and achieve their goals.

Paralinguistics and Performers

In performance arts, paralinguistics is indispensable for conveying emotions and building narratives.



Educators play a pivotal role in shaping minds, and their ability to communicate effectively is enhanced by paralinguistic skills.

1. Clarifying Concepts:
   - Tone and emphasis help educators explain complex ideas, making lessons more accessible and engaging.
   - Pauses and changes in pitch signal the importance of specific points, aiding in knowledge retention.
2. Fostering Engagement:
   - Dynamic gestures and vocal variety keep students' attention, creating an interactive and stimulating learning environment.
3. Building Rapport:
   - Friendly and approachable paralinguistic cues help educators establish trust and create a positive classroom atmosphere.

In corporate and organizational settings, communication professionals rely on paralinguistics to convey messages effectively and foster collaboration.

1. Negotiations and Presentations:
   - In negotiations, tone and pitch convey confidence and assertiveness, while pauses allow time for reflection and strategy.
   - During presentations, vocal variety and engaging gestures keep stakeholders interested and invested.
2. Conflict Resolution:
   - Non-verbal cues such as empathetic tone and open body language demonstrate understanding and de-escalate tensions.
3. Cross-Cultural Communication:
   - Understanding cultural nuances in paralinguistics helps professionals navigate diverse workplaces and communicate effectively with global teams.

Paralinguistics is a cornerstone of effective communication across various professional fields. For public speakers, it ensures audience engagement and message clarity. For performers, it conveys emotion and builds connections. Educators rely on it to foster understanding and create dynamic classrooms, while communication professionals use it to influence, negotiate, and resolve conflicts. Mastering paralinguistic elements is not just an advantage; it is a necessity for professionals aiming to excel in their fields. By honing these skills, they can enhance their communication impact, achieve their objectives, and inspire those they engage with.

Effective communication extends beyond the words we use; it is deeply influenced by paralinguistic elements such as tone, pitch, gestures, facial expressions, and body language. These nonverbal cues play a significant role in shaping how messages are conveyed, interpreted, and understood.

Tone refers to the vocal quality or emotional coloring of speech. It helps convey the speaker's feelings, intentions, and attitudes. For example, a warm and friendly tone can build rapport, while a harsh or indifferent tone may create distance or conflict. A mismatch between tone and verbal content can lead to misinterpretation. Imagine saying "I'm fine" with a sarcastic tone versus a cheerful one; the meaning perceived by the listener changes drastically.

Pitch, or the perceived highness or lowness of a voice, is another crucial paralinguistic element. Variations in pitch can indicate emotions such as excitement, sadness, or anger. High-pitched speech often conveys urgency or enthusiasm, while lower pitches may communicate seriousness or authority. Monotonous speech, lacking variation in pitch, can lead to disinterest or disengagement in listeners.

Gestures and body language add a visual dimension to communication, often reinforcing or complementing spoken words. A simple nod can indicate agreement, while crossed arms may signal defensiveness. Gestures can also serve as substitutes for words, especially in contexts where verbal communication is limited. However, cultural differences in gesture interpretation require careful attention to avoid misunderstandings.

Facial expressions are among the most universal forms of nonverbal communication. A smile conveys friendliness and approachability, while a frown suggests dissatisfaction or concern. Microexpressions—brief, involuntary facial movements—can reveal underlying emotions that a person may be trying to conceal. These subtle cues often play a critical role in understanding the true feelings behind spoken words. Proxemics, or the use of space in communication, also influences interaction dynamics. The distance maintained between individuals can signal intimacy, formality, or dominance. For instance, standing too close in a formal setting may be perceived as intrusive, while maintaining a comfortable distance fosters respect and ease.

The timing of speech and strategic use of pauses can greatly enhance communication. Well-timed pauses provide listeners with the opportunity to process information and can emphasize key points. Conversely, interruptions or poorly timed responses may disrupt the flow of conversation and lead to frustration or confusion.

The volume and speed of speech significantly affect how messages are received. Speaking too softly may result in inaudibility, while excessive loudness might come across as aggressive. Similarly, rapid speech can overwhelm listeners, whereas a slow pace can suggest thoughtfulness or, at times, a lack of urgency.

The combined effect of these paralinguistic elements creates the overall impression of a message. A confident speaker may use a steady tone, appropriate pitch, and open gestures to establish trust and authority. On the other hand, incongruence among these elements—such as nervous gestures accompanying confident words—can create confusion or skepticism.

Paralinguistics—the nonverbal elements of communication such as tone, pitch, gestures, and facial expressions—are fundamental to effective public speaking and performance. By incorporating paralinguistic training into workshops, participants can develop a well-rounded communication style that enhances their confidence and impact. Below are practical tips for integrating these elements into public speaking and performance training:

- To start with self-awareness: Encourage participants to evaluate their natural paralinguistic tendencies. Self-awareness exercises such as recording speeches or performances can help them recognize patterns in tone, pitch, gestures, and body language. Feedback sessions should focus on identifying strengths and areas for improvement, laying the foundation for deliberate practice.

- To emphasize the power of tone and pitch: Facilitate exercises that help participants experiment with tone and pitch.
- To incorporate gesture training: Gestures add a dynamic visual component to communication. Include activities that teach purposeful and culturally appropriate gestures, such as:
- Mirror Exercises: Pair participants to mirror each other's gestures and movements, fostering awareness of their physical expressions.
- Gesture Mapping: Assign participants to create gestures that align with specific phrases or concepts, emphasizing clarity and emphasis.
- To focus on facial expressions: Facial expressions are crucial for conveying emotions and connecting with an audience. Practice exercises such as:
- Emotion Roleplay: Assign participants different emotions to express while delivering the same sentence.
- Microexpression Analysis: Use videos or images to analyze subtle facial cues and discuss their impact on communication.
- To teach effective body language: Body language significantly impacts audience perception. Help participants develop confident and open postures through:

Posture Practice: Conduct activities where participants practice standing tall with relaxed shoulders and open stances.

Movement Awareness: Use stage or space exercises where participants practice deliberate movements, such as stepping forward for emphasis or pausing to hold attention.

- To highlight the role of pauses: Pauses are powerful tools for adding emphasis and allowing audiences to process information. Train participants to:
- Use Strategic Pauses: Practice pausing after key points or questions.
- Avoid Fillers: Incorporate exercises that help eliminate filler words like "um" and "uh" through deliberate pausing.

Literature Review

Several theories contribute to understanding paralinguistics in communication. Mehrabian's (1971)[2] **7-**38-55 Rule suggests that 7% of communication is conveyed through words, 38% through vocal elements (tone, pitch, etc.), and 55% through body language. This framework underscores the importance of non-verbal aspects, including paralinguistics, in conveying emotions and intentions.

Goffman's (1959)[3] Dramaturgical Theory in sociology also applies to public speaking and performance. It views communication as a performance where speakers use voice modulation and body language to present a desired image. This theory aligns with findings that public speakers and performers who skillfully employ paralinguistic cues can create a more compelling and persuasive presence.

Studies confirm that paralinguistics enhances emotional expression and fosters audience engagement. Knapp and Hall (2014)[4] emphasize that vocal qualities such as pitch variation and dynamic intonation significantly contribute to emotional expressiveness, making speeches and performances more engaging. Likewise, Scherer (2003)[5] explores the role of prosody—changes in tone, pitch, and rhythm—in conveying emotions effectively, with findings indicating that audiences respond more positively to varied and expressive vocal delivery. Research in performance arts (Ekmann & Friesen, 1975)[6] highlights that non-verbal cues, including facial expressions and gestures, reinforce spoken messages, improving emotional resonance. Actors and public speakers leverage paralinguistics to align vocal and physical cues with their intended message, enhancing audience connection. Paralinguistic cues vary across cultures,

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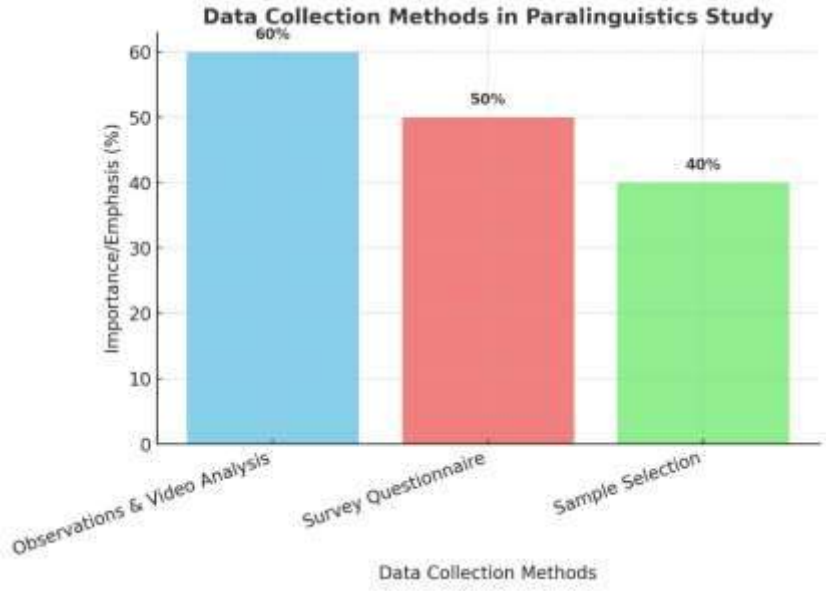
influencing their interpretation and effectiveness in diverse communication contexts. Hall's (1976)[7] High-Context vs. Low-Context Communication Theory suggests that non-verbal elements, including paralinguistics, are more critical in high-context cultures (e.g., Japan, China) than in low-context cultures (e.g., the U.S., Germany), where explicit verbal messages carry greater weight. Research by Matsumoto and Hwang (2012)[8] highlights cultural variations in vocal expressions and gestures, cautioning against misinterpretations in cross-cultural interactions. For example, while direct eye contact and expressive vocal delivery signal confidence in Western cultures, they may be perceived as aggressive or disrespectful in some Asian cultures.

Methodology

This study employs a qualitative research design to explore the impact of paralinguistics in public speaking and performance. A combination of descriptive and interpretive approaches will be used to analyze the role of vocal and non-verbal elements in effective communication. The study focuses on understanding how speakers and performers utilize paralinguistics to enhance engagement, emotional connection, and message clarity[9].



Data Analysis

1. Thematic Analysis

Qualitative data from interviews and observations will be analyzed using thematic analysis, identifying key themes related to the role of paralinguistics in communication.

2. Statistical Analysis

Quantitative data from surveys will be analyzed using descriptive and inferential statistics, including:

- Frequency distribution of responses.
- Correlation analysis between paralinguistic factors and audience engagement.

Ethical Considerations

- Informed Consent**:** All participants will be informed about the study's purpose and their rights before participation.
- Confidentiality: Data will be anonymized to protect participants' identities.
- Voluntary Participation**:** Participants may withdraw at any stage without consequences.

Limitations

[7] Hall, E. T. (1976). *Beyond culture*. Anchor Books.
[8] Matsumoto, D., & Hwang, H. C. (2012). *Culture and nonverbal communication*.
[9]Matsumoto, D., & Hwang, H. C. (2012). *Culture and nonverbal communication*.

- The study focuses on a limited number of participants, which may affect generalizability.
- Cultural differences in paralinguistics may introduce variability in interpretation.
- Observational bias in video analysis may impact the objectivity of findings.

Discussion

1. *Enhancing Emotional Connection*

One of the most prominent themes emerging from the study is the ability of paralinguistic elements to foster emotional connections between speakers and audiences. Participants in interviews emphasized that variations in tone and pitch were critical in conveying passion, sincerity, and urgency[10].

- Speakers who modulated their voice and facial expressions effectively were perceived as more engaging and credible**.**
- Survey responses highlighted that audiences responded positively to expressive speakers, with 85% of respondents stating that a dynamic speaking style made presentations more memorable.

2. Clarity and Emphasis in Communication

The study supports the assertion that strategic use of pauses and vocal variety helps emphasize key points. Observational data revealed that successful speakers:

- Used pauses before and after critical statements to allow information to resonate with the audience.
- Adjusted volume and tone to highlight important concepts, making messages clearer and more persuasive.

Additionally, video analysis showed that monotonous delivery and excessive speech speed often led to lower audience engagement levels, reinforcing the need for controlled pacing.

3. *Impact on Speaker Confidence and Authority*

Paralinguistic cues also play a crucial role in projecting confidence and authority. The findings indicate that:

- Lower pitch and controlled pacing were associated with authority and credibility.
- Speakers who maintained open gestures and upright posture were perceived as more self-assured and persuasive.
- Nervous gestures such as excessive hand movements and inconsistent eye contact negatively impacted credibility.

These findings align with Mehrabian's (1971)[11] 7-38-55 rule, which emphasizes the dominance of vocal and non-verbal elements in communication effectiveness.

4. *Cultural Variations in Paralinguistic Interpretation*

A notable insight from this study is the cultural variability in the interpretation of paralinguistic cues. Interviewees from different cultural backgrounds emphasized:

- Eye contact**:** In some cultures, direct eye contact signals confidence, while in others, it can be perceived as aggressive or disrespectful.
- Silence and Pauses**:** Some cultures view strategic pauses as a sign of thoughtfulness, whereas others may interpret them as hesitation or uncertainty.

Implications for Public Speaking and Performance

The study's findings have practical applications for public speakers, educators, performers, and business professionals**.**

1. Training in Paralinguistics**:**
   - Public speaking workshops should incorporate exercises that develop vocal variety, gestures, and facial expressions**.**

[10] . Burgoon, J. K., Guerrero, L. K., & Floyd, K. (2016). *Nonverbal communication*. Routledge.
[11] Mehrabian, A. (1971). *Silent messages: Implicit communication of emotions and attitudes*. Wadsworth Publishing.

- Speakers should engage in video self-analysis to refine their delivery.

2. Application in Professional and Educational Contexts:

- Educators can utilize paralinguistics to enhance student engagement and comprehension**.**
- Business professionals should be trained in paralinguistic techniques to improve persuasion in presentations and negotiations.

3. Cross-Cultural Considerations:

- Speakers addressing diverse audiences must be aware of cultural nuances in non-verbal communication**.**
- Adapting to audience preferences enhances rapport and message effectiveness**.**

Results

The results of this study provide substantial evidence that paralinguistic elements significantly influence public speaking and performance. Data collected through interviews, observations, video analyses, and survey responses highlight the importance of tone, pitch, volume, pace, pauses, facial expressions, and gestures in enhancing communication effectiveness[12].

1. Emotional Engagement and Audience Perception

Survey data indicates that 83% of respondents reported that speakers with expressive paralinguistic features were more engaging and persuasive. Observations confirmed that:

- Varied pitch and tone kept audiences attentive and emotionally connected.
- Facial expressions and gestures reinforced verbal messages and increased relatability.
- Pauses strategically used improved message clarity and emphasis.

Interview responses from public speakers and performers also emphasized that authenticity in tone and facial expressions was key to maintaining audience trust and emotional resonance.

2. The Role of Paralinguistics in Message Clarity

Observational analysis revealed that speakers who modulated their voice and used deliberate pauses were rated as more comprehensible and effective**.**

- 76% of surveyed audience members stated that clear, intentional use of tone and pitch variations helped them better retain information.
- Recorded speeches showed that speakers who maintained a steady yet dynamic vocal delivery were perceived as more credible.
- Overuse of monotonous tone or excessive gestures resulted in lower audience engagement.

3. Confidence and Professional Presence

Paralinguistics was found to be a key factor in projecting confidence. Thematic analysis of interviews revealed that:

- Lower pitch and controlled pacing were associated with authority and professionalism.
- Open body language and sustained eye contact enhanced credibility and audience rapport.
- Nervous movements and inconsistent volume control diminished speaker effectiveness.

4. Cultural Considerations in Paralinguistics

Cultural variations in the use of paralinguistics were also observed.

- Direct eye contact was interpreted as confidence in some cultures, while in others, it was seen as confrontational.
- Silence and pauses were appreciated as a sign of thoughtfulness in some regions but perceived as uncertainty in others.
- Gestural communication norms varied significantly across audiences, requiring adaptation by speakers in multicultural settings[13].

Conclusion

[12] Mishra, Binod. "Role of Paralanguage in Effective English Communication." *ICFAI Journal of Soft Skills* 3.2 (2009).

[13] Mishra, Binod. "Role of Paralanguage in Effective English Communication." *ICFAI Journal of Soft Skills* 3.2 (2009).

Integrating paralinguistics into public speaking and performance workshops enriches participants' communication abilities, enabling them to connect with audiences more effectively. By focusing on tone, pitch, gestures, facial expressions, and other nonverbal elements, trainers can help participants master the art of holistic communication. With practice and feedback, these skills transform ordinary speakers into compelling and memorable communicators.

Paralinguistics—the nonverbal elements of communication that accompany spoken words—play a crucial role in public speaking and performance. These elements, such as tone, pitch, gestures, facial expressions, and body language, are pivotal in engaging audiences, conveying emotions, and enhancing the impact of a message. Understanding the interplay between paralinguistics and various public speaking and performance contexts can help speakers and performers tailor their delivery to maximize effectiveness.

Paralinguistics is a critical component of both public speaking and performance, shaping how messages are delivered and received. By mastering tone, pitch, gestures, facial expressions, and other nonverbal cues, speakers and performers can adapt to diverse contexts, ensuring their communication is impactful and memorable. Whether in a corporate boardroom, a classroom, or on stage, understanding the nuances of paralinguistics unlocks the potential for authentic and engaging interactions.

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The Role Of Context In Lexical Semantics: Analyzing How Different Contexts Affect The Meanings Of Words And Phrases, With Examples From Various Languages

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Abstract
The study of lexical semantics, a subfield of linguistics that looks at word meanings and how context affects interpretation, is examined in this article. To illustrate how words carry meaning and change depending on linguistic, cultural, and situational settings, it offers a thorough examination of several important theoretical frameworks, including componential analysis, prototype theory, frame semantics, and distributional semantics. Cross-linguistic research between Uzbek and English reveals both language-specific and universal patterns in semantic interpretation, especially with regard to politeness tactics, idiomatic phrases, and polysemy**.** With an emphasis on the need of semantic shifts for language acquisition, natural language processing (NLP), and intercultural communication, the challenges in contextual analysis and machine translation are also covered in the study; a comparative approach is adopted, so contributing to a more comprehensive knowledge of how meaning is constructed, interpreted, and changed across languages and contexts.
Keywords: Lexical semantics, polysemy, frame semantics, componential analysis, prototype theory, contextual meaning, cross-linguistic analysis, semantic shifts, idiomatic expressions, machine translation, natural language processing, language learning, cultural context.

Introduction

Lexical semantics in linguistics is the study of word meanings and interactions among them. Understanding how languages convey meaning and how different components influence how one understands words and sentences is quite vital[1].

1. *Lexical semantics is the definition and scope of lexical meaning*, that which particular words or phrases convey. Semantic relations include synonymy—that is, comparable meanings—antonymy—that is, opposite meanings—polysemy—that is, numerous related meanings—and homonymy—that is, identical forms with unrelated meaning. Lexical semantics investigates how words represent real thoughts and how their meanings change based on language and cultural context.

2. *Theoretical Approaches in Lexical Semantics*: Several key frameworks guide the study of lexical semantics: componential analysis breaks down word meanings into smaller semantic features. For example, the word “bachelor” can be analyzed as [+male], [+adult], [-married]. Prototype theory suggests that meanings are based on prototypical examples rather than strict definitions. For instance, the prototypical "bird" might be a robin rather than a penguin. Frame semantics proposes that words evoke mental structures called “frames” that provide contextual understanding (e.g., the word "hospital" evokes concepts like doctors, patients, and medical care). Distributional semantics focuses on how word meanings can be inferred from their usage patterns in large corpora, based on the idea that words occurring in similar contexts often have related meanings.

[1] Katz, J. J., & Fodor, J. A. (1963). The Structure of a Semantic Theory. *Language*, 39(2), 170-210

3. *Importance of Lexical Semantics in Linguistics***:** Lexical semantics is essential for various areas of linguistics and language-related fields: understanding language structure helps in mapping how words are organized and categorized in different languages. Cross-Linguistic comparisons enables the study of how different languages express similar concepts, providing insights into cultural perceptions**.** Language evolution by analyzing semantic changes over time, lexical semantics sheds light on how languages evolve and adapt. Pragmatics and contextual meaning highlights how word meanings shift depending on situational or conversational contexts.
4. Challenges in Lexical Semantics: Despite its contributions, the study of lexical semantics faces challenges such as:
- Polysemy and Ambiguity: Resolving meanings for words with multiple interpretations based on context.
- Dynamic Meanings: Words frequently change meaning due to social, technological, and cultural shifts.
- Data Limitations: Access to large, diverse corpora for semantic analysis can be limited, particularly for lesser-studied languages[2].

Literature Review

A crucial field of linguistic study that examines the nature of word meanings, their relationships, and the contextual elements that affect interpretation is lexical semantics. The structuralist methods, which saw meaning as a component of a systematic linguistic framework, are the roots of early research on lexical semantics. The relational aspect of meaning was highlighted by academics like Ferdinand de Saussure, who maintained that words get meaning via their distinctions from one another. Later, the discipline was broadened by cognitive linguists who introduced frameworks that questioned traditional definitions of categories, such as prototype theory.
Katz and Fodor (1963)[3] introduced componential analysis to break down words into semantic features (e.g., [+human], [-plural]). Although this approach provided a systematic way of representing word meanings, critics argued that it struggled to account for polysemy and idiomatic expressions.
Rosch (1975)[4] proposed that categories have prototypical members rather than strict boundaries. This theory highlighted the gradient nature of meaning, where certain instances are more representative of a category than others.
Fillmore (1982)[5] emphasized that word meanings are embedded within broader conceptual frames or schemas, which capture related knowledge structures.
Advances in computational linguistics, particularly through Harris (1954)[6] distributional hypothesis, argue that words appearing in similar contexts tend to have related meanings.
The significance of context in determining word meanings is being emphasized more and more in lexical semantics research. The dynamic interaction between language input and the conversation, social context, and cultural environment around it is the focus of contextual semantics. Studies show that co-text significantly influences the interpretation of polysemous words. For example, Tuggy (1993)[7] demonstrated how context resolves ambiguity in polysemous constructions. Gumperz (1982)[8] and Hymes (1974)[9] explored how situational and cultural factors influence lexical choices and interpretation. Cross-cultural studies highlight differences in how politeness, honorifics, and idiomatic expressions are used. Research by

[2] Paradis, C. (2012). Lexical semantics. In *The encyclopedia of applied linguistics*. Wiley-Blackwell.
[3] Katz, J. J., & Fodor, J. A. (1963). The Structure of a Semantic Theory. *Language*, 39(2)
[4] Rosch, E. (1975). Cognitive Representations of Semantic Categories. *Journal of Experimental Psychology: General*, 104(3)
[5] Fillmore, C. J. (1982). Frame Semantics. In Linguistics in the Morning Calm (pp. 111-137). Seoul: Hanshin Publishing
[6] Harris, Z. (1954). Distributional Structure. *Word*, 10(2-3), 146-162.
[7] Tuggy, D. (1993). Ambiguity, Polysemy, and Vagueness. *Cognitive Linguistics*, 4(3), 273-290
[8] Gumperz, J. J. (1982). Discourse Strategies. Cambridge: Cambridge University Press.
[9]Hymes, D. (1974). Foundations in Sociolinguistics: An Ethnographic Approach. Philadelphia: University of Pennsylvania Press.

Grice (1975)[10] on implicature shows that the speaker's intent and conversational norms play crucial roles in deriving meaning beyond literal interpretations.

Cross-linguistic comparisons have revealed both universal trends and language-specific phenomena in lexical semantics. For example: Wierzbicka (1996)[11] highlighted semantic universals, such as basic kinship terms and spatial relations, which appear across languages. Talmy (1985)[12] compared verb-framed and satellite-framed languages to illustrate how different languages encode motion events. Studies in Uzbek and English reveal notable contrasts in how idiomatic expressions and politeness strategies are conveyed, reflecting distinct cultural norms.

The literature on lexical semantics provides valuable insights into how meaning is constructed, negotiated, and interpreted across languages and contexts. By addressing existing gaps and integrating findings from cross-linguistic and computational studies, future research can contribute to a more comprehensive understanding of the complexities of lexical meaning.

Methodology

• The methodology seeks to provide a strong foundation for investigating how contextual factors influence word meanings and interpretations across languages. The study uses a qualitative and comparative research design, with components of corpus linguistics and semantic analysis. This study takes a cross-linguistic approach to lexical semantics in both monolingual (e.g., Uzbek) and bilingual (e.g., English-Uzbek) situations[13]. The research is organized as follows:

• *Qualitative Analysis:* Contextual analysis of semantic shifts and polysemy using linguistic examples.

• *Comparative Analysis*: Cross-cultural comparisons to identify universal and language-specific phenomena.

The analysis follows a step-by-step approach to explore different semantic phenomena:

1. *Lexical Categorization:* Identifying and categorizing lexical items based on their semantic relationships (e.g., synonymy, antonymy, polysemy).
2. *Contextual Mapping:* Analyzing the contextual factors (linguistic, cultural, situational, and pragmatic) that influence the interpretation of words and phrases.
3. *Cross-Linguistic Comparison:* Comparing lexical interpretations in English and Uzbek to highlight semantic similarities and differences.
4. *Semantic Shift Analysis:* Identifying patterns of meaning shifts due to cultural and pragmatic influences.
5. *Frame Semantics Application:* Applying frame semantics to understand how words evoke broader conceptual structures in different contexts.

Potential limitations of the study include:

• *Data Availability:* Limited corpora for lesser-studied languages such as Uzbek.

• *Contextual Ambiguity:* Challenges in resolving meaning for idiomatic expressions without rich contextual examples.

• *Comparative Challenges:* Differences in cultural norms and linguistic structures may introduce variability in cross-linguistic comparisons.

The methodology described above offers a thorough foundation for investigating lexical semantics in many languages and circumstances. By combining qualitative research, corpus-based techniques, and cross-linguistic comparisons, the project hopes to provide useful insights into how meaning is formed, understood, and shifted within and between languages.

Discussion

[10] Grice, H. P. (1975). Logic and Conversation. In P. Cole & J. L. Morgan (Eds.), Syntax and Semantics (Vol. 3, pp. 41-58). New York: Academic Press.
[11] Wierzbicka, A. (1996). *Semantics: Primes and Universals*. Oxford: Oxford University Press.
[12] Talmy, L. (1985). Lexicalization Patterns: Semantic Structure in Lexical Forms. In T. Shopen (Ed.), *Language Typology and Syntactic Description* (pp. 57-149). Cambridge: Cambridge University Press.
[13] Yusupov, O. N. (2016). Cognitive semantics in context. *Wschodnioeuropejskie Czasopismo Naukowe*, *7*(2)

Lexical semantics studies how words and phrases express meaning in a language. Understanding how context influences word interpretation is an important component of lexical semantics. Contextual variables alter the meanings of lexical items and shape how language is perceived in various communicative circumstances[14].

1. Definition of Context in Lexical Semantics. In linguistic terms, context refers to the surrounding information, including linguistic, cultural, and situational elements, that helps determine the meaning of a word or phrase. Contextual factors can clarify ambiguities, enrich interpretations, and influence word associations.

2. Types of Contextual Factors: Several types of contextual factors shape lexical semantics:

- Linguistic Context: Refers to the surrounding words, phrases, and sentences within a text or conversation.
  - *Example*: In the sentence, “He went to the bank to sit by the water,” the word “bank” is understood as a riverbank due to the surrounding phrase "by the water."
- Situational Context: Encompasses the physical or social environment in which communication occurs.
  - *Example*: The phrase “Can you pass the salt?” is interpreted as a request at a dining table but might be seen as irrelevant or sarcastic in an unrelated setting.
- Cultural Context: Relates to the cultural norms, traditions, and shared knowledge within a speech community.
  - *Example*: The word “holiday” may evoke a festive gathering in one culture but a quiet vacation in another.
- Pragmatic Context: Involves the speaker’s intention and the implied meaning behind their words.
  - *Example*: A sarcastic “Oh, great!” after a mishap signals frustration rather than genuine approval.

3. Impact of Contextual Factors on Meaning. Contextual factors contribute to several key aspects of lexical meaning:

- Disambiguation: Context helps resolve ambiguities in words with multiple meanings (e.g., “run” as an athletic activity versus “run” as managing an operation).
- Polysemy Interpretation: Context dictates which related sense of a polysemous word is relevant in a given situation.
- Emotion and Tone: The surrounding context can highlight emotional undertones conveyed by specific word choices.

4. Cross-Linguistic Variations in Contextual Interpretation: The influence of contextual factors can vary significantly between languages*:*

- In English, rising intonation may signal a question, while in some languages, tone variations serve as crucial markers of word meaning.
- In Uzbek, formal settings often require specific tone variations and respectful speech patterns, whereas English may rely more on word choice than intonation to convey politeness.

5. Applications of Contextual Understanding in Linguistics:

- Natural Language Processing (NLP): Context-aware systems in NLP aim to improve machine translation, sentiment analysis, and conversational AI by incorporating contextual factors to enhance accuracy.
- Cross-Cultural Communication: Understanding context-specific meanings helps bridge communication gaps between speakers from different cultural backgrounds.
- Language Learning: Language learners benefit from understanding how contextual cues influence meaning, improving comprehension and interaction skills.

6. Challenges in Contextual Analysis:

- Ambiguity in Minimal Context: When limited context is available, interpreting word meanings becomes challenging.

[14]Kwantes, P. J. (2005). Using context to build semantics. *Psychonomic Bulletin & Review*, *12*(4), 703-710..

- Dynamic Contexts: Meaning can shift depending on changing situational and cultural factors.
- Corpus Limitations: Some linguistic corpora may not provide rich enough contextual examples, making semantic analysis less comprehensive.

Monolingual Analysis of Context in Lexical Semantics. Monolingual analysis in lexical semantics investigates how context changes the meanings of words and phrases within a single language. Linguists can gain a better understanding of how several elements, such as grammatical structure, cultural knowledge, and discourse environment, influence semantic interpretation by exploring the internal intricacies of a single language. This article investigates the role of monolingual context in lexical semantics and describes the many contextual influences involved[15].

Monolingual context refers to the language-specific features that influence word meaning and interpretation within a single linguistic system. It includes linguistic, social, and situational factors that help to disambiguate meanings, particularly in circumstances of polysemy and homonymy.

Context resolves ambiguities when a single word has multiple meanings. For example, the word “run” can mean a physical action or managing an event based on its context. Phrases like “kick the bucket” require contextual understanding to interpret their figurative rather than literal meaning. Context influences whether formal or informal language is appropriate, affecting lexical choices and interpretations.

Recognizing how context influences word meanings helps learners develop complex vocabulary usage. Monolingual dictionaries use contextual examples to accurately describe and explain word meanings. Monolingual context analysis in lexical semantics emphasizes the importance of linguistic, situational, cultural, and pragmatic elements in forming word meanings within a single language. Linguists can acquire a better understanding of language structure, usage, and communication patterns by investigating these influences. This study helps to improve language instruction, computational linguistic models, and cross-contextual understanding, emphasizing the role of context in interpreting meaning within a linguistic framework.

Cross-Linguistic Analysis of Context in Lexical Semantics. Cross-linguistic analysis in lexical semantics investigates how different languages encode and interpret word meanings in response to contextual circumstances. This comparative method focuses on how linguistic, cultural, and pragmatic circumstances affect the semantics of lexical elements across languages. Cross-linguistic research sheds light on how language-specific and universal principles impact human cognition and communication. This essay delves into the key contextual elements in cross-linguistic lexical semantics and its ramifications.

Cross-linguistic analysis compares semantic interpretations of words and phrases across languages. This approach looks into how different contexts—linguistic, cultural, and situational—influence the way languages express and understand meanings.

Different languages may resolve polysemous words in unique ways. For example, the English word “light” (referring to brightness or weight) may have distinct lexical items in other languages. Idioms often do not translate directly across languages due to cultural and contextual differences. The English phrase “spill the beans” may have an entirely different metaphorical counterpart in Uzbek. Levels of formality and politeness vary between languages, influencing word choices and interpretations.

In English, phrases such as “in the morning” and “at noon” indicate specific parts of the day, while some languages may use broader or more culturally defined time frames.

In Uzbek, requests are often softened using respectful tones and indirect expressions, while English tends to use more direct phrasing with optional polite markers like “please.”

[15] Spätgens, T., & Schoonen, R. (2018). The semantic network, lexical access, and reading comprehension in monolingual and bilingual children: An individual differences study. *Applied Psycholinguistics*, *39*(1), 225-256.

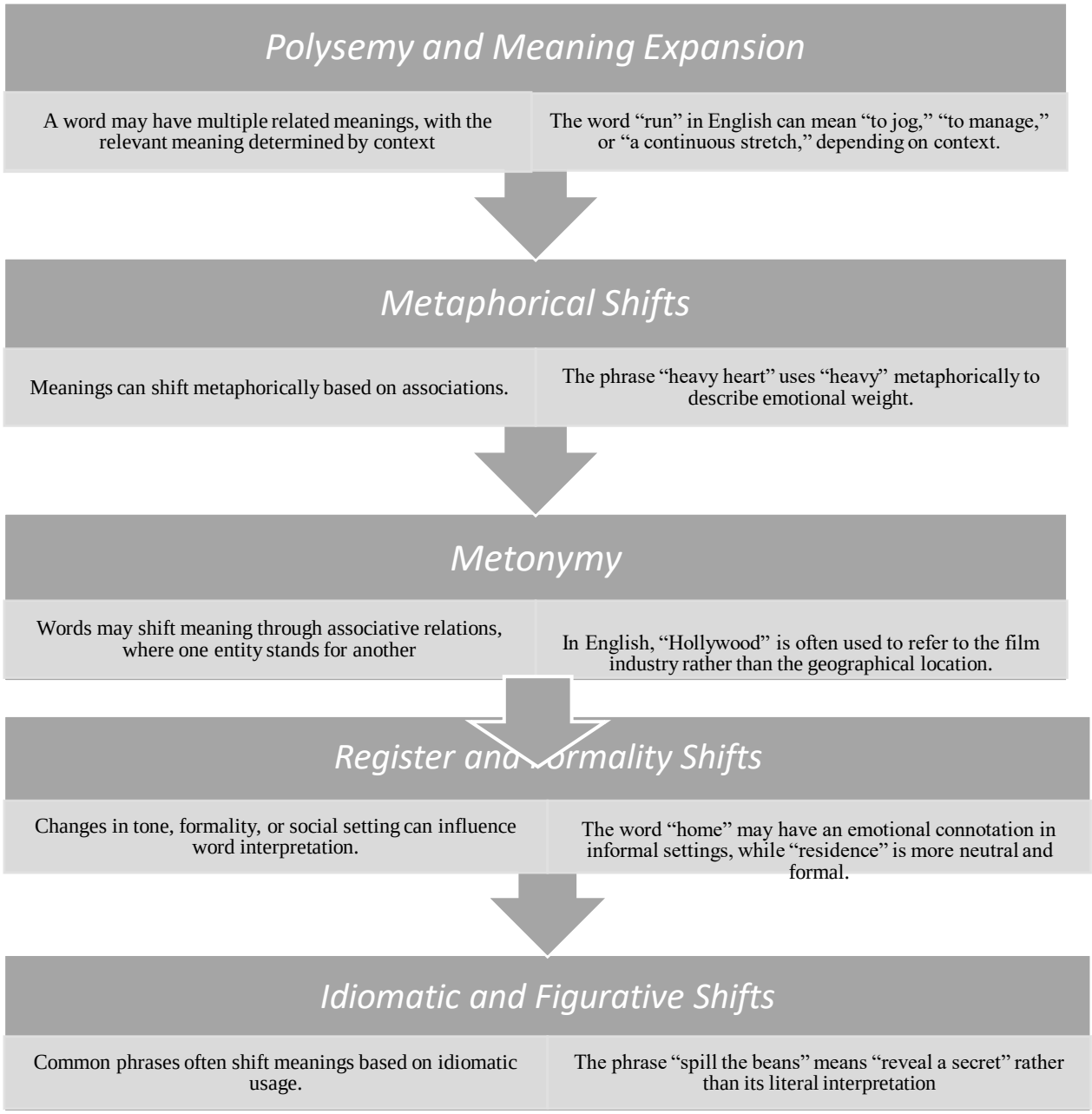
Cross-linguistic analysis of context in lexical semantics demonstrates the subtle ways in which language, culture, and cognition interact to shape meaning. By comparing contextual influences across languages, researchers can find both universal patterns of meaning and language-specific variances. This comparative method increases our understanding of language structure, promotes cross-cultural communication, and advances language technologies. The study of context in lexical semantics emphasizes the necessity of understanding how meaning is dynamically generated and reconstructed throughout multilingual conversation.

Context-Specific Semantic Shifts in Lexical Semantics. Cross-linguistic analysis of context in lexical semantics demonstrates the subtle ways in which language, culture, and cognition interact to shape meaning. By comparing contextual influences across languages, researchers can find both universal patterns of meaning and language-specific variances. This comparative method increases our understanding of language structure, promotes cross-cultural communication, and advances language technologies. The study of context in lexical semantics emphasizes the necessity of understanding how meaning is dynamically generated and reconstructed throughout multilingual conversation[16].

When a word's meaning varies depending on the context in which it is used, this is known as a semantic shift. These changes can range from polysemy (having several connected meanings) to metaphorical reinterpretations, and they can be minor or significant.

Types of Contextual Semantic Shifts

[16] Bezuidenhout, A. (2017). The role of context in semantics: A Relevance Theory perspective. *Meaning, Context and Methodology*, 91-114



In **English**, rising intonation in "You're coming?" signals a question, whereas the same intonation in some languages may not change the sentence type. In **Uzbek,** phrases that reflect respect often use indirect expressions, causing a shift in meaning when translated directly.
Context-specific semantic shifts in lexical semantics show language's dynamic nature and its reliance on context to convey meaning. These variations highlight the necessity of understanding how linguistic, cultural, and environmental elements interact to shape meaning. Linguists can improve cross-cultural communication, boost language processing technologies, and gain a better understanding of language evolution by examining context-specific semantic changes. Semantic changes remind us that meaning is fluid, molded by the constantly shifting conditions of human interaction**.**

Results

According to lexical semantics, a word or phrase's meaning can change dynamically based on a variety of situational, linguistic, and cultural situations. Linguists, educators, and computer systems can all gain a better understanding of the fluidity of language by recognizing patterns in the way meanings vary depending on the situation.

Semantic shifts occur in consistent ways across different contexts and languages, often following recognizable trends:

Broadening of Meaning	• A word's meaning expands to encompass a wider range of uses. • The English word "holiday" originally referred to religious observances but now also refers to any vacation or break from routine.
Narrowing of Meaning	• A word's meaning becomes more specific over time or in particular contexts. • The word "meat" once referred to any type of food but now specifically refers to animal flesh in modern English.
Metaphorical Extensions	• Words take on new meanings based on metaphorical associations. • The phrase "bright future" uses "bright," typically associated with light, to metaphorically describe positivity or success.
Shift in Emotional Connotation	• Some words gain positive or negative connotations depending on context. • The term "clever" can be complimentary in some contexts but imply trickery or deceit in others.
Contextual Idiomatic Shifts	• : Phrases that carry different meanings based on idiomatic use. • The phrase "hit the books" is understood as "study hard" rather than its literal interpretation.

Cross-linguistic studies reveal that some semantic shifts are universal, while others are language-specific:

• *Universal Trends*: Concepts like "family," "time," and "nature" often have broad and metaphorical semantic extensions across cultures.

• *Language-Specific Trends*: Certain cultural practices give rise to unique idiomatic shifts. For example, Uzbek speech often employs respectful euphemisms that do not directly translate into English.

• Understanding the dynamic nature of language requires seeing patterns in how meanings vary across contexts. Linguists who recognize patterns of semantic shifts can help to build more effective language teaching, translation tools, and cross-cultural communication tactics. Semantic trends demonstrate that language is not static, but rather evolves fluidly to context, reflecting both universal principles and cultural differences in communication.

How Findings Contribute to Existing Semantic Theories. Lexical semantics studies how words and phrases convey meaning, frequently emphasizing how context influences and shifts these meanings. The investigation of semantic shifts and trends across contexts gives crucial insights that aid in the development and refining of current semantic theories.

1. Componential Analysis. Componential analysis breaks down word meanings into semantic features or components, such as [+animate], [+human], or [-plural]. Findings on semantic shifts reveal that these components are not always fixed and may change contextually. Studies on polysemy and idiomatic expressions demonstrate that certain semantic features are activated or suppressed depending on linguistic and situational contexts. *Example*: The word "head" may emphasize its [+body part] feature in "head injury" but highlight its [+leader] feature in "head of department."

2. Prototype Theory. According to prototype theory, meanings are not centered on rigid boundaries but rather around prototypical examples. Contextual findings demonstrate how discourse settings or cultural norms can change what is seen as a prototype meaning. *Example*: In English, the prototype for the word “bird” might be a robin, but in Australia, a kookaburra may serve as a more typical example due to regional familiarity.
3. Frame Semantics. Frame semantics posits that words elicit mental structures or "frames" that enable a more comprehensive conceptual comprehension. Empirical data on context-specific interpretations supports the notion that frames are adaptable and can change depending on the speaker's intentions and cultural background. The word "hospital" activates different frames in settings requiring medical emergency and administrative activities, demonstrating that semantic frames may be dynamically restructured.
4. Distributional Semantics. According to distributional semantics, word meanings are derived from patterns of usage in huge corpora. The findings on cross-linguistic semantic shifts show that co-occurrence patterns alone cannot account for context-dependent meanings, underlining the necessity for enriched corpora that capture pragmatic and situational nuances. *Example*: Sentences like “She broke the news” and “She broke the glass” illustrate how usage patterns must be analyzed with contextual cues to capture figurative versus literal meanings[17].
5. Pragmatics and Contextual Implications. Pragmatics studies how meaning is influenced by implied context, speaker intention, and conversational norms. Research on sarcastic remarks, idiomatic shifts, and politeness strategies supports the pragmatic perspective that context governs how literal and non-literal meanings are conveyed. *Example*: The phrase “Well done!” can convey genuine praise or sarcasm based on tone, setting, and prior discourse[18].
Empirical studies in lexical semantics add to current theories by showing how meaning changes in response to context. These contributions improve theoretical frameworks such as componential analysis, prototype theory, and frame semantics while also providing guidance for practical applications in linguistics, technology, and language education. Finally, investigating semantic alterations across contexts highlights the complexities of meaning and emphasizes the importance of dynamic, context-sensitive methods to language comprehension.
Context-Aware Systems and Challenges in Machine Translation. Context-aware systems in machine translation (MT) aim to improve the quality of translations by accounting for linguistic, situational, and cultural contexts that shape meaning. While traditional MT systems primarily rely on word-for-word or phrase-based translations, context-aware approaches seek to capture the subtleties of meaning that change depending on context.
Context plays a crucial role in interpreting meanings accurately, as words and phrases often have multiple meanings based on their usage:
- Linguistic Context: The surrounding text or discourse provides clues for disambiguating words. *Example*: The English word “bank” can refer to a financial institution or a riverbank depending on its co-text.
- Situational Context: The social and physical setting can influence how language is interpreted. *Example*: In an informal conversation, "Can you give me a hand?" is understood as a request for help, not a literal reference to a hand.
- Cultural Context**:** Idioms, expressions, and metaphors can vary significantly across cultures. *Example*: The English idiom “kick the bucket” translates figuratively as “to die,” but a literal translation in another language might be meaningless.
Context-aware MT systems aim to improve translation accuracy by considering various contextual layers:
Coherence and Consistency: Context-aware systems analyze larger text segments to maintain consistent terminology across sentences and documents.

[17] Harris, Z. (1954). Distributional Structure. *Word*, 10(2-3), 146-162.
[18] Verspoor, C. M. (1997). Contextually-dependent lexical semantics.

Pronoun Resolution: Identifying the correct referent for pronouns like "he," "she," or "it" in translations. *Example*: In gender-neutral languages like Uzbek, context-aware MT helps disambiguate pronouns that do not have a direct equivalent in English[19].

Expression Handling: Recognizing and correctly translating idiomatic phrases. *Example*: Translating “spill the beans” into an equivalent idiomatic phrase rather than a literal word-for-word rendering.

Despite their advancements, context-aware MT systems face several challenges:

- Data Limitations**:** Training models requires large, context-rich corpora in multiple languages, which may not be readily available for less-studied languages.
- Context Ambiguity: Some contexts remain ambiguous even to human readers, making it difficult for machines to resolve meaning without additional clues.
- Computational Complexity: Processing long contexts for accurate translations can increase computational load, slowing down performance.
- Cultural Nuances: Some cultural references or idiomatic phrases have no direct equivalent in the target language, requiring interpretative translation.

Context-aware machine translation represents a significant step forward in producing more accurate and meaningful translations. By accounting for linguistic, situational, and cultural contexts, these systems can reduce errors and improve communication across languages. However, challenges such as data scarcity, cultural nuances, and computational demands highlight the need for ongoing research and innovation. As MT systems continue to evolve, context-aware models will play a pivotal role in bridging language gaps and enhancing cross-cultural communication.

Reflection on Universal vs. Language-Specific Phenomena. In the study of lexical semantics, understanding the balance between universal and language-specific phenomena is crucial for comprehending how meaning is constructed and conveyed across languages and cultures. Universal aspects of language reflect cognitive and communicative patterns shared by all humans, while language-specific features highlight the diversity in how different languages encode and interpret meaning[20].

Universal phenomena are patterns and principles that appear consistently across multiple languages, suggesting a shared cognitive basis for meaning. Certain semantic categories, such as kinship terms (e.g., “mother,” “father”) and body parts (e.g., “hand,” “eye”), are found across nearly all languages. Many languages extend physical concepts to describe abstract emotions and states (e.g., “warm heart” for kindness). Terms for basic spatial relations like “in,” “on,” and “under” are present in most languages, though specific usage may vary. While some languages have unique counting systems, the general concept of enumeration and quantification is nearly universal.

Language-specific phenomena reflect cultural, historical, and grammatical influences that shape how languages encode meaning:

- *Idiomatic Expressions*: Each language has unique idioms that may be difficult to translate directly. *Example*: The English phrase “it’s raining cats and dogs” has no exact equivalent in many other languages.
- *Honorifics and Formality*: Languages like Korean, Japanese, and Uzbek have complex honorific systems that encode respect and social hierarchy, which may not be directly translatable into languages with simpler formality structures like English.
- *Polysemy and Word Usage*: Some languages may use a single word for multiple meanings that other languages distinguish more explicitly. *Example*: In Russian, the word “рука” means both “arm” and “hand,” whereas English distinguishes between the two.

[19] Kaiser, E., Runner, J. T., Sussman, R. S., & Tanenhaus, M. K. (2009). Structural and semantic constraints on the resolution of pronouns and reflexives. *Cognition*, *112*(1), 55-80.
[20] Goddard, C. (2001). Lexico-semantic universals: A critical overview. *Linguistic typology*, *5*(1), 1-65.

Reflection on universal and language-specific phenomena in lexical semantics underscores the complexity of meaning construction. While many semantic principles are shared across languages, cultural and grammatical differences give rise to unique interpretations and expressions. By identifying both commonalities and divergences, linguistic research can enhance cross-cultural communication, improve translation accuracy, and contribute to robust theoretical models of meaning. Understanding these phenomena not only enriches our knowledge of language but also highlights the shared human experience and the diversity that shapes linguistic expression.

Conclusion

Advancements in lexical semantics research provide valuable insights for improving language education, natural language processing (NLP) tools, and cross-cultural communication. Understanding how meanings shift across contexts, languages, and cultures contributes to building more effective learning frameworks, accurate computational tools, and clearer communication strategies in multilingual settings. This article outlines the practical implications of semantic research across these domains.

Lexical semantics informs the development of language learning resources by addressing how context influences meaning and usage. This can help learners navigate the subtleties of language more effectively.

Highlighting Polysemy and Contextual Meanings: Language learners benefit from recognizing that words can have multiple meanings depending on context. *Example*: The English word “light” can refer to brightness or weight, which learners must distinguish based on surrounding text.

Cultural Context in Idiomatic Expressions**:** Teaching materials can include cultural explanations of idiomatic phrases to prevent literal misinterpretations. *Example*: Explaining that “break the ice” means to start a conversation rather than literally breaking ice.

Focus on Pragmatic Competence**:** Lessons can emphasize how politeness, tone, and social norms affect language use. *Example*: Learners of Uzbek must understand that indirect language often signals respect.

Natural language processing tools rely heavily on semantic frameworks to interpret and generate human language accurately. Context-aware approaches are essential to avoid errors in tasks such as machine translation, sentiment analysis, and conversational AI.

The study of lexical semantics plays a crucial role in shaping effective language learning tools, improving NLP systems, and enhancing cross-cultural communication. By accounting for context-specific semantic shifts and cultural differences, educational materials can better support learners, NLP technologies can deliver more accurate outputs, and communication across cultural boundaries can become clearer and more empathetic. Continued research and innovation in these areas will help bridge linguistic gaps and foster mutual understanding in an increasingly interconnected world.

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Demographic-Migration Processes In Jizzakh Region In The Second Half Of The 20th Century

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Abstract
This thesis analyzes the demographic and migration processes that occurred in the Jizzakh region in the second half of the 20th century. The main focus is on population growth, migration flows, urbanization, and changes in the national composition. The analysis shows that these processes are directly related to economic and social factors.
Keywords: Migration, cotton farming, demographic situation, Mirzachol, urbanization, development.
Annotatsiya
Mazkur tezisda XX asrning ikkinchi yarmida Jizzax viloyatida yuz bergan demografik va migratsion jarayonlar tahlil qilingan. Aholi sonining o‘sishi, migratsiya oqimlari, shaharlashuv va milliy tarkib o‘zgarishlari asosiy e’tiborga olingan. Tahlillar ushbu jarayonlarning iqtisodiy va ijtimoiy omillar bilan bevosita bog‘liqligini ko‘rsatadi.
Kalit so’zlar: Migratsiya, paxtachilik, demografik ahvol, Mirzacho’l, shaharlashish, o’zlashtirish.

Demografik migratsiya dinamikasi turli xil omillar va asoslarning o'zaro bog'liqligi natijasida shakllanadi. Insonlarning bir hududdan boshqa hududga ko'chishiga turtki beruvchi asosiy omillardan biri iqtisodiy va ijtimoiy sabablardir. Bular orasida ishsizlik, munosib ish o'rinlarini izlash, shuningdek, oliy va o'rta maxsus ta'lim olish kabi maqsadlar alohida ahamiyatga ega. Bundan tashqari, noqulay iqlim sharoitlari, moddiy va madaniy-maishiy turmush darajasidan norozilik, shuningdek, oilaviy sharoitlarning ta'siri kabi omillarni ham keltirib o'tish mumkin.
XX asrning ikkinchi yarmi Jizzax viloyati uchun demografik va migratsion o'zgarishlarga boy bo'ldi, bu jarayonlar Markaziy Osiyoning ko'plab mintaqalariga nisbatan tezroq va qiyinroq kechdi. Viloyatning iqtisodiyoti va jamiyatining rivojlanishi shu davrda aholi sonining ko'payishi va uning harakatlanishi bilan chambarchas bog'liq edi, bu esa mintaqa taraqqiyotiga katta ta'sir ko'rsatdi. Sovet davrida amalga oshirilgan markazlashgan migratsiya siyosati bu o'zgarishlarning asosiy omili bo'ldi. Mirzacho'lni o'zlashtirish, yerlarni yaxshilash va paxta ekin maydonlarini kengaytirish uchun Jizzaxga Farg'ona vodiysi, Qashqadaryo va Surxondaryo viloyatlaridan ko'plab odamlar ko'chirildi. Birgina misol 1956–1969-yillar oralig’ida Mirzacho‘lga doimiy yashash maqsadida 42 ming oila ko‘chib kelgan bo’lsa, 1969-yilga kelib, ularning atigi 25 ming nafarigina shu yerda doimiy yashab qoldi. 17 ming oila yoki barcha ko‘chib kelganlarning 40,5%i o‘zlarining yashash joylariga ko‘chib ketishga majbur bo‘ldilar[1]. Bu ko'chishlar faqat respublika ichida bo'lib qolmay, balki Rossiya, Ukraina, Belarus kabi Sovet Ittifoqining boshqa hududlaridan va koreys millatiga mansub aholining ham ko'chib kelishiga olib keldi. Viloyatga ko'chib o'tganlar asosan agrar sohada, xususan paxtachilikda, mexanizatsiyalashgan guruhlarda va melioratsiya tadbirlarida mehnat qildilar. 1973-yilda Jizzax viloyatining mustaqil ma'muriy birlik sifatida tuzilishi bilan ushbu hududga davlat e'tibori kuchaydi. Katta miqdordagi investitsiyalar yo'naltirildi, sanoat korxonalari barpo etildi, yo'l va turar joy infratuzilmasi kengaytirildi. Bu o'sishga nafaqat tashqi migratsiya, balki tabiiy o'sish – yuqori tug'ilish darajasi ham muhim ta'sir ko'rsatdi. Sog'liqni saqlash sohasidagi yaxshilanishlar

[1] Begimkulov J. Mustaqillik yillarida Jizzax viloyatida aholi migratsiyasi. Mamalakatimizda migratsiya sohasidagi davlat boshqaruvining dolzarb masalalari. Xalqaro konferensiyasi materiallari to`plami. T.: 2020.

va tibbiy xizmatlarning kengayishi o'lim ko'rsatkichini kamaytirdi, tug'ilish esa yuqori darajada qoldi. Yillik tabiiy o'sish 2,5–3% atrofida bo'lib, bu demografik bosimni kuchaytirdi.

Ikkinchi jahon urushi yakunlangach, Mirzachoʻl hududidagi ishlov berilmagan yerlarni foydalanishga kiritish maqsadida turli viloyatlardan odamlarni koʻchirish ishlari amalga oshirildi. 1946-yil 2-fevralda Sovet Ittifoqi Xalq Komissarlari Soveti tomonidan qabul qilingan “Oʻzbekiston SSRda paxtachilikni rivojlantirish tadbirlari toʻgʻrisida”gi muhim hujjatga muvofiq, Oʻzbekistonda toʻrtinchi besh yillik davr mobaynida paxta ishlab chiqarish hajmini 2,5 barobarga oshirish vazifasi belgilandi. Ushbu qarorga binoan, yangi oʻzlashtirilgan hududlarga, jumladan, Mirzachoʻlga aholini koʻchirish jarayoni yanada jadallashtirildi[2]. Viloyat va tuman komissiyalari uchun ishlab chiqilgan qaror ijrosi rejasida aholi gavjum joylarni aniqlash va ulardan yangi yerlarga odamlarni ko'chirish vazifasi topshirildi. Tasdiqlangan reja doirasida, 1947-yilda tashkil etilayotgan sovxozlarga 1863 kolxozchi oilasi, 1950-1952-yillarda esa 3986 oila ko'chirildi. Mirzacho'lga asosan Farg'ona vodiysi, Samarqand va Jizzax viloyatlarining tog'li hududlarida istiqomat qiluvchi va doimiy ish bilan ta'minlanmagan aholining bir qismi ko'chirildi. Sobiq Ittifoq hukumati belgilangan maqsadlarga erishish uchun moddiy resurslar bilan ta'minlashga katta e'tibor qaratdi[3]. Jizzax viloyatidagi migratsiya holatlari tarixiy ildizlarga ega. Oʻtgan asrning oʻrtalarida Mirzachoʻlning oʻzlashtirilishi munosabati bilan respublikaning turli hududlaridan, xususan, qoʻshni Samarqand viloyatining Jomboy, Payariq, Bulungʻur, Pastdargʻom tumanlari va Navoiy viloyatining Nurota tumanidan koʻplab odamlar bu yerga koʻchib oʻtgan[4]. Jizzax viloyati va unda tashkil etilgan yangi qishloq tumanlarining aholi tarkibi, asosan, migratsiya jarayonlari natijasida vujudga kelgan. Shuningdek, urbanizatsiya jarayonlari ham bu davrda sezilarli darajada jadallashdi. Jizzax shahri, G'allaorol, Do'stlik va boshqa shaharlarda aholi zichligi oshdi, qishloqlardan shaharlarga ko'chish holatlari ko'paydi. 1959-yilda viloyatda shahar aholisining ulushi 18% bo'lgan bo'lsa, 1989-yilda bu ko'rsatkich 34% ga yetdi. Bu ichki migratsiya oqimlarini yuzaga keltirdi va shahar infratuzilmasiga yuklama orttirdi. Ammo bu demografik o'sish va migratsiya harakatlari mintaqada ekologik va ijtimoiy muammolarni ham keltirib chiqardi. Mirzacho'lning o'zlashtirilishi, suv resurslarining cheklanganligi, sho'rlanish va yer tanqisligi viloyatda yashash sharoitini og'irlashtirdi. Uy-joy ta'minoti, ishsizlik va transport infratuzilmasidagi yetishmovchiliklar migratsiya oqibatlarini yanada murakkablashtirdi.

Jizzax viloyati Oʻzbekiston Respublikasining ma’muriy tuzilishida muhim ahamiyatga ega boʻlib, oʻtgan asrning ikkinchi yarmida sezilarli demografik transformatsiyalarni va migratsiya dinamikasini boshidan kechirgan regionlardan hisoblanadi. 1973-yilda Jizzax viloyatining tashkil etilishi bilan ushbu territoriyada populatsiya soni, tuzilishi va dislokatsiyasi boʻyicha sifatli hamda sonli modifikatsiyalar roʻy berdi. Mazkur intervalda iqtisodiy taraqqiyot, gʻoʻza plantatsiyalarining ekspansiyasi, irrigatsiya choralari, urbanizatsiya va harbiy-industrial infratuzilmaning vujudga kelishi kabi faktorlar viloyatda aholi migratsiyasi va oʻrnashishining kompleks koʻrinishini shakllantirdi. Sovet davrida amalga oshirilgan markazlashgan migratsiya siyosati, ayniqsa 1960-1980 yillarda, Jizzax viloyatiga Fargʻona vodiysi, Qashqadaryo, Toshkent viloyatlari va boshqa sovet respublikalaridan aholi koʻchib kelishiga turtki boʻldi. Ushbu jarayonlar hududda demografik yuksalishga, tabiiy resurslardan foydalanishning oshishiga, shuningdek, shahar va qishloqlarda ijtimoiy-iqtisodiy infratuzilmaning paydo boʻlishiga olib keldi. Bundan tashqari, migratsiya oqimlari natijasida viloyatning etnik tarkibida muhim oʻzgarishlar roʻy berdi. Ushbu mavzuning dolzarbligi shundaki, XX asrning ikkinchi yarmining demografik va migratsion oʻzgarishlari bugungi Jizzax viloyatining ijtimoiy-iqtisodiy rivojlanishida, aholi zichligi va taqsimlanishida, shahar va qishloq infratuzilmasining

[2] Rasulbek DAVLETOV. 1946–1980-yillarda Mirzachoʻl hududidagi migratsion jarayonlar. Жамият ва инновациялар – Общество и инновации – Society and innovations Special Issue – 11 (2021) / ISSN 2181-1415

[3] Tursunov S. Qishloq aholisini uy-joy va maishiy sharoitlarini yaxshilash muammolari. T.: 1994.13

[4] Солиев А. Ўзбекистон иқтисодий ва ижтимоий географияси. – Тошкент: Университет, 2014. – 143 б.

shakllanishida va ekologik vaziyatda o‘z aksini topgan. Shuning uchun bu tarixiy jarayonlarni ilmiy asosda o'rganish, ularning ijtimoiy sabablari va natijalarini tahlil qilish nafaqat ilmiy, balki amaliy ahamiyatga ham ega. Ushbu tadqiqot XX asrning ikkinchi yarmida Jizzax viloyatida sodir bo'lgan demografik dinamika, tashqi va ichki migratsiya oqimlari, ularning ijtimoiy-iqtisodiy va madaniy ta'sirini har tomonlama o'rganishga qaratilgan. Bu O'zbekiston tarixidagi muhim bosqichlardan biri - viloyatlarning demografik evolyutsiyasi va aholi harakatining tarixiy xaritasini aniqlashga yordam beradi.

Ushbu tarixiy jarayonlarni o‘rganish viloyatdagi demografik muhitning shakllanish qonuniyatlarini aniqlashga xizmat qiladi. Shuningdek, bunday o‘rganish natijalari bugungi kunda hududiy rivojlanish rejalari, shaharsozlik va infratuzilma siyosatini belgilashda, aholiga ijtimoiy xizmat ko‘rsatish tizimlarini takomillashtirishda asos bo‘lib xizmat qilishi mumkin. Bu esa demografik barqarorlik va ijtimoiy-iqtisodiy farovonlikni ta’minlash yo‘lida muhim qadamdir. Umuman olganda, XX asrning ikkinchi yarmida Jizzax viloyatidagi demografik-migratsion jarayonlar tarixiy jarayonlar, davlat siyosati, iqtisodiy ehtiyojlar, tabiiy sharoitlar va xalqaro migratsiya oqimlari ta’sirida shakllanib, hudud taraqqiyotida muhim iz qoldirgan murakkab va ko‘p qirrali hodisa bo‘lgan.

Foydalanigan adabiyotlar:

Rasulbek DAVLETOV. 1946–1980-yillarda Mirzacho‘l hududidagi migratsion jarayonlar. Жамият ва инновациялар – Общество и инновации – Society and innovations Special Issue – 11 (2021) / ISSN 2181-1415

Tursunov S. Qishloq aholisini uy-joy va maishiy sharoitlarini yaxshilash muammolari. T.: 1994.13

Солиев А. Ўзбекистон иқтисодий ва ижтимоий географияси. – Тошкент: Университет, 2014. – 143 б.

Begimkulov J. Mustaqillik yillarida Jizzax viloyatida aholi migratsiyasi. Mamalakatimizda migratsiya sohasidagi davlat boshqaruvining dolzarb masalalari. Xalqaro konferensiyasi materiallari to`plami. T.: 2020.

Analysis Of Hydrocarbon Gas Combustion Processes Through CFD Modeling Based On Theoretical And Experimental Approaches

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Introduction. The growing demand for energy resources, the need for environmental safety, and the improvement of fuel efficiency have made the in-depth study of hydrocarbon gas combustion processes a pressing issue. These processes directly determine not only the generation of thermal energy but also the amount of exhaust gases produced. In particular, increasing the efficiency of combustion, gaining a deeper understanding of heat transfer mechanisms, and developing environmentally compliant technologies require a modern scientific and technical approach.

Nowadays, the use of Computational Fluid Dynamics (CFD) methods enables the development of mathematical and visual models of combustion processes, as well as the analysis of temperature distribution, gas flow, mixing phenomena, and chemical reactions. Moreover, when combined with experimental research, CFD modeling results contribute to the reliability and accuracy of the models. In this study, hydrocarbon gas combustion processes are investigated on both theoretical and experimental bases, modeled using CFD software, and the obtained results are analyzed. The findings of the research are of significant practical importance for the design and optimization of energy systems.

Research Methodology. The combustion processes of hydrocarbon gases represent complex physico-chemical phenomena involving heat and mass transfer, various reaction rates, turbulence, and radiation effects. In this study, the theoretical analysis of ideal combustion conditions of hydrocarbon gas mixed with air was conducted, identifying the key parameters for both laminar and turbulent regimes. A two-step reaction model, based on multiple elementary reactions, was employed as the kinetic model of the combustion process.

Experimental investigations were carried out under laboratory conditions. The combustion chamber had a cylindrical shape with an internal diameter of 150 mm and a height of 500 mm. A premixed gas-air mixture was introduced into the chamber. Temperature, pressure, and gas composition were measured using a thermocouple, a manometer, and a gas analyzer, respectively. During the experiments, the stability of the combustion process and the flame structure were observed.

CFD Modeling. The combustion process of hydrocarbon gases was modeled using Computational Fluid Dynamics (CFD) methods in the ANSYS Fluent software. The geometry and mesh were created using the ANSYS Meshing module. The total number of mesh elements was approximately 300,000, and a structured mesh was generated.

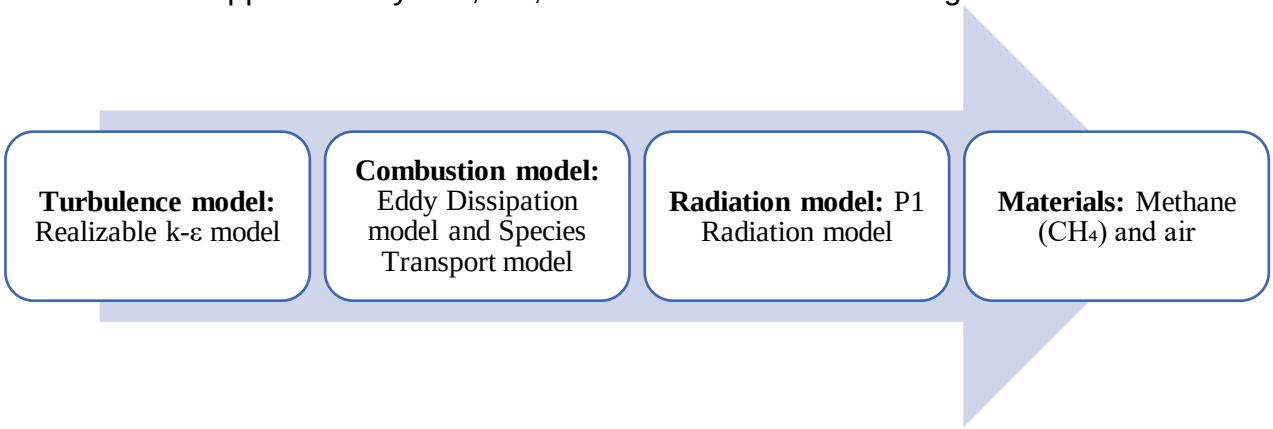

Figure 1. The following physical models were used in the simulation:

Boundary conditions were defined as follows: Inlet flow: Methane-air mixture at 1 atm pressure and 300 K temperature, Outlet: Pressure outlet, Walls: Adiabatic condition.
During the analysis, the following parameters were monitored: temperature distribution, flame structure, concentrations of CO_2 and NOx emissions, and heat flux.

Research Results and Analysis:
CFD Modeling Results: According to the CFD simulation results, the temperature distribution within the combustion chamber reached its maximum along the central axis. Due to the complete combustion of the methane–air mixture, peak temperatures were recorded in the range of 1980–2100 K. The combustion zone formed a symmetric shape, with steep temperature gradients observed at the flame front.
The velocity field distribution showed that high-temperature combustion products rose upward, generating strong convective motion. The maximum velocity was observed at the edges of the combustion zone, reaching approximately 12–15 m/s, indicating stable flame behavior and dynamic gas flow characteristics.
Exhaust Gas Analysis: The main exhaust components — carbon dioxide (CO_2) and nitrogen oxides (NOx) — were closely monitored. Based on the CFD model results:
- The **CO_2 concentration** peaked within the combustion zone, reaching up to **9–10%**.
- The **NOx emissions** increased due to high temperatures and an extended flame length, with concentrations estimated in the range of **~120–150 ppm**.

These values closely matched the experimental measurements, thereby confirming the reliability and accuracy of the CFD modeling results.
Comparison with Experimental Results
The temperature values measured during the experiment corresponded to the CFD simulation results with a deviation of approximately **5–7%**. This discrepancy may be attributed to several factors:
- Incomplete representation of **heat losses through the chamber walls** in the simulation model
- **Uncertainties in the actual composition** of the gas mixture
- **Accuracy limitations** of the measurement instruments

However, the overall trends — including flame shape, locations of maximum temperature, and concentrations of exhaust gases — were complementary and consistent between the CFD simulations and experimental results.

Conclusion. This study investigated the combustion processes of hydrocarbon gases using theoretical, experimental, and Computational Fluid Dynamics (CFD) methods. Through CFD simulation, the distributions of temperature, velocity, and exhaust gases were determined, and their physico-chemical characteristics were thoroughly analyzed.
Comparison with experimental results demonstrated that CFD modeling provides a high degree of accuracy and reliability. In particular, data obtained on flame stability, heat distribution, and exhaust components (CO_2, NOx) confirmed the effectiveness of the modeling approach.
The study yields the following conclusions:
- CFD models enable effective visual and mathematical analysis of hydrocarbon gas combustion processes;
- Optimal combustion conditions for methane-air mixtures were identified, with evaluations of high-temperature zones and exhaust emissions;

- The findings have practical significance for the design of industrial fuel systems, heat exchange devices, and environmentally safe technologies.

Future work plans include reducing high-temperature emissions, improving combustion efficiency, and conducting modeling studies based on new types of fuels such as biogas and hydrogen blends.

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Lingupoetic Analysis Of The Poetry Of Nurmuhammad Aziz (In Respect Of Occasional Meaningful Units)

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Abstract
In this article, we conducted a linguopoetic study of the poems of Nurmuhammad Aziz, a young poet with a lively spirit and his own words and style in Uzbek poetry, at the lexical level. Nurmuhammad Aziz is the author of poems that are in tune with the people of today and at the same time harmonized with the memories of the past. It is worth noting that the poet was able to masterfully use the possibilities of our language in his creations and create his own unique style from linguopoetic means, which will be proven in the linguopoetic analysis of the poet's poems below.
Keywords: Linguvopoetics, poetic actual language means, occasional units, unity of form and content, originality.

The use of poetically actualized language tools in the poetry of Nurmuhammad Aziz.
Naturally, there are a number of principles of linguopoetic analysis of a work of art. M.Yuldoshev, who has studied the problem of linguopoetics of a literary text in detail based on Uzbek language materials, in his monograph "Linguopoetics of a Literary Text", indicates the following main principles of linguopoetic analysis: 1) an approach based on the unity of form and content; 2) proceeding from the unity of space and time; 3) assessment based on the relationship between the national language and the literary language; 4) an approach to the literary text as an artistic-aesthetic whole; 5) identification of poetically actualized language means in the literary text; 6) identification of the ratio of explicitness and implicitness in the literary text; 7) identification of the linguistic and semantic characteristics of the mechanisms of intertextuality in the literary text. [1]The researcher emphasizes that identifying poetically actualized language means in a literary text is one of the important principles in linguopoetic analysis, because by revealing the linguistic and artistic essence of such means, one can clearly imagine the mechanisms of formation and expression of artistic content. Indeed, this principle is convenient in directly determining and assessing the aesthetic value of a literary text and can also serve as a basis for working on the basis of other principles. Moreover, being able to imagine linguistic art on the basis of this principle does not burden even a novice analyst, since the object of analysis is the specific language units in the text. It is appropriate to base linguopoetic analysis on this principle, namely, the principle of identifying poetically actualized language units loaded with poetic content and evaluating them accordingly. Such an analysis, while demonstrating the artist's skill in using the possibilities of the inexhaustible wealth of our language, helps to reveal the entire essence of the units in the service of artistic intention, to objectively assess them. Below, we will analyze the phenomena of occasional meaning in the work of Nurmuhammad Aziz.

Units of occasional meaning in the poetry of Nurmuhammad Aziz.
The term occasionalism is derived from the Latin word “occasonalis”, and according to its lexical meaning it means “accidental”. In linguistic dictionaries it is defined as follows: “A usual, comparative figure of speech that does not correspond to generally accepted usage, has a singular character, and is embedded in a special text structure”. [2]Occasional meaning is a

[1]Yuldashev M. Linguopoetics of the literary text. - Tashkent: Publishing House "Fan" of the Academy of Sciences of the Republic of Uzbekistan. 2008.
[2]Khojiev A. Explanatory dictionary of linguistic terms. - Tashkent: "UZBEK NATIONAL ENCYCLOPEDIA" STATE SCIENTIFIC PUBLISHER.

much broader concept, with a much wider scope. Words with an occasional meaning are present in the vocabulary of the language, but they have an occasional meaning in the same literary text to which they belong, that is, an author uses words from the dictionary in his work in a semantic sense other than their own, assigning them a new meaning, and this meaning of the word is distinguished by the fact that it is a novelty that has not been used in any speech before. In occasionalism, there is also the concept of "occasional words", which is used to refer to the creation or creation of a new word that does not exist in the dictionary. Occasional meaning units are words or stable combinations that deviate from their usual meaning and convey a new meaning. Occasional units, which are found in the poetry of Nurmuhammad Aziz, are also notable for their new and unusual figurative expressions in poetry.

A figurative expression or paraphrase is a combination of one word with another figurative expression used to express our thoughts figuratively and effectively. This phenomenon is formed through years of experience in the language and is accepted into the language as it becomes popular, and those that are accepted are preserved in the mind of a person as a stable, that is, unchanging combination. As an example of figurative expressions existing in our language, we can say that **cotton is white gold; corn is the queen of the field** . However, the creator, through his artistic and aesthetic thinking and extraordinary creative vision, can create new figurative expressions and use them as occasional meaningful units in his works. Below we will analyze the poems of Nurmuhammad Aziz, which use paraphrases, which are a product of artistic thinking:

Queen of the world - musicha

The free flight in your head is also a poem. (From the poem "March Lines")

In this passage, we witness the poet looking at the hummingbird, a simple bird, with a special look and describing it as **the queen of** the world, and the reason for this is the influence of an incomparable joy and pleasure in the poet's heart in the first days of spring. On such days, the hummingbird flying overhead also seems somehow special and pleasant to the poet, giving him inspiration.

Poetry is a long, rich memory,

A poet whose hair is like sand in the night.

Poetry - the blood dripping from your chest -

The joy of making flowers from ink. (From the poem "Poetry")

his poem **"Politics," the author** describes the word politics with unique figurative expressions:

Oh, ***Politics is a blind eye,***

A shackle that does not like freedom.

and also describes it as **"a living red dragon, a bleeding wolf."** This is an example of an extraordinary figurative expression in a poetic text.

Conscience is a precious stone,

Don't be fooled by flattery. (From the poem "The Little Summary")

From this passage, the conclusion is drawn that conscience is a great gift from God and should not be sold for trivial things. The description of conscience as a gift from God is a reference to its divinity and greatness.

Another occasional meaningful unit in the poet's work is the assignment of the meanings of "observability, wisdom" to the lexemes of the Sun and Moon.

The philosopher *watches the sun from the sky*

A sprout blooms,

A little light shines.

The stone in the hand of my growing child,

When I think about it, my heart cries out. (From the poem "If you throw a stick at your father...")

the "philosopher sun" used in this poetic passage assigns the meaning of observation, wisdom, and witnessing everything from above to the lexeme of the sun, and as a result, the sun, like philosophers, is depicted as silently and wisely observing the earth from above. In his

poem, which begins **with "From the flower...", the poet uses** the same image for **the crescent moon:**

Hilal is a narrator, *the tale is long,*
This is the end of the story.
The word "old mountains" means "heroes".
A tool that encourages courage.

the lexeme **Hilal is used** differently from the previous one. **The narrator is being charged with a** relative meaning. A narrator is a person who observes, talks about, and evaluates events from the outside. Therefore, the Moon is also an image that observes everything from above, tells long stories, and interprets everything. The difference in the image expressed in both poems is that one is compared to a philosopher and the other to a narrator, but the point where the meanings of the images in both poems intersect is that both the Moon and the Sun have the meaning of observing everything from above and from the outside. This indicates that there is a special hidden commonality in the poet's work and that the creator has his own style. In conclusion, the linguopoetic analysis of a literary text serves to reveal the poetic possibilities of this language and to assess the author's skill in using the linguistic resources available in the treasury of the language. Nurmuhammad Aziz was also able to express unique poetic landscapes and unique occasional units while adhering to the laws of our language. The poet's work is distinguished by the simplicity, depth, expressiveness and unique juiciness of the language and means of artistic expression. Above, we have presented for you the works included in the poet's first book, the poetry collection "Zarif ghʻusalar" and their brief linguopoetic analysis, and we think that we were able to tell you a little about the poet's talent and skill in using words. According to the opinions of a number of literary scholars, the first book of the author predicts his further creative path. We can say that Nurmuhammad Aziz's first poetry collection, "Zarif ghusalar", was a worthy and uniquely bold step towards entering the world of literature.

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Linguistic Approach To The Problem Of Dyslexia In Uzbek-Speaking Children

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Abstract
In this article, the issue of dyslexia in Uzbek-speaking children and its symptoms are discussed in detail. Additionally, linguistic approaches to identifying and preventing dyslexia are examined, along with reflections and insights on addressing this issue.
Keywords: dyslexia, linguistic approach, method, neurolinguistics, psycholinguistics, phonology.
Annotatsiya
Ushbu maqolada o‘zbek tilida so‘zlashuvchi bolalardagi disleksiya muammosi va uning belgilari haqida alohida to‘xtalib o‘tiladi. Shuningdek, ushbu muammoga lingvistik yondashgan holda disleksiya muammosini aniqlash, oldini olish yuzasidan fikr-mulohazalar yuritiladi.
Kalit so‘zlar: disleksiya, lingvistik yondashuv, metod, neyrolingvistika, psixolingvistika, fonologiya.

Bugungi kunda ilmiy tadqiqotlar an`anaviy tilshunoslikda yetarlicha tadqiq etilgan nazariy masalalardan biroz chekinib, tilning amaliy jihatlarini ko‘proq o‘rganmoqda. Tilning grammatik tuzilishidan ko‘ra ko‘proq uning jamiyat bilan, boshqa sohalar bilan aloqasini tadqiq etish dolzarb masalaga aylandi. Bu o‘z o‘rnida yangi tilshunoslik sohalarining paydo bo‘lishiga zamin yaratdi. Sotsiolingvistika, psixolingvistika, neyrolingvistika kabi yangi sohalar shular jumlasidandir. Bular ichida neyrolingvistika tilshunoslikning eng zamonaviy sohalaridan biri bo‘lib, neyrolingvistika - tilning miyada qanday namoyon bo‘lishini, til va miyaning tuzilishi va faoliyati o‘rtasidagi munosabatlarni o‘rganadigan tilshunoslikning yangi bo‘limi hisoblanadi. Neyrolingvistika tilning miyada qanday namoyon bo‘lishini o‘rganadi: ya'ni bizning miyamiz biz gapiradigan, tushunadigan, o‘qiydigan va yozadigan til (yoki tillar) haqidagi bilimlarimizni qanday va qayerda saqlashini, biz o‘zlashtirganimizda miyamizda nima sodir bo‘lishini o‘rganadi.
Neyrolingvistlar, shuningdek, miya fiziologiyasi haqidagi tushunchalarga asoslanib, “nevrologik tuzilmalar haqidagi bilimlardan til tuzilishigacha umumlashtirib” tilning tuzilishi va tashkil etilishi haqida yangi bashoratlar qilishlari mumkin. Aynan neyrolingvistika sohasida o‘zbek tilshunosligida hali deyarli tadqiq etilmagan bir nechta masalar mavjud. Bular, asosan, bolalarda kuzatiladigan disleksiya, disgrafiya, afaziya kabilardir.[1] Ushbu maqolada o‘zbek tilida so‘zlovchi bolalarda uchraydigan disleksiya, uning belgilari va uni lingvistik yondashgan holda qanday aniqlash va oldini olish usullariga to‘xtalib o‘tamiz.
So‘nggi paytlarda ta`limga berilayotgan e`tibor kuchaymoqda. Bola ta`limiga nafaqat boshlang‘ich sinfdan, balki bog‘cha ta`limidan boshlab kuchli e`tibor qaratish masalasi ilgari surilmoqda. Lekin ko‘plab bog‘cha va maktab o‘qituvchilari, ota-onalar bolalar o‘rganish jarayonida duch keladigan disleksiya, disgrafiya, diskalkuliya kabi muammolardan bexabar

[1] Bektemirova, Z. (2020). Developing Reading Skills in Children with Dyslexia: An Uzbek Perspective. *Asian Journal of Education and Learning*, 10(4), 75-90.

tarzda o‘zlashtira olmagan bolalarni dangasalikda, uquvsizlikda ayblab kelmoqda. Aslida esa bu holatlar bugungi kunda dunyo tilshunosligiga yetarlicha ma`lum. Bu holatlar o‘rganish bilan bog‘liq muammolar natijasida yuzaga keladi.

Dastavval, disleksiya va uning o‘zbek tilidagi ta`rifiga to‘xtalib o‘tsak. “Disleksiya – asli kelib chiqishi neyrobiologik bo‘lib, o‘qish, yozish va imlo bilan bog‘liq bo‘lgan o‘rganishdagi qiyinchiliklardir. Bu asosan miya faoliyatdagi buzilishlariga bog‘liq bo‘lib, intellektual qobiliyat bilan bog‘liq emas. Ya`ni bola IQ darajasi boshqa tengdoshlari bilan teng bo‘lgan va hatto ulardan yuqori bo‘lgan holatda ham disleksiyaga duch kelishi mumkin. Disleksiyaga chalingan bolalar odatda boshqa aqliy vazifalarda ko‘proq qobilyatga ega bo‘lishlari mumkin, lekin o‘qish va yozishda qiyinchiliklarga duch kelishadi. Masalan, ular qo‘shiq aytish, musiqiy asboblar chalish, rasm chizish kabilarda tengdoshlaridan iqtidorliroq bo‘lishi isbotlangan[2]”. Dunyoga mashxur ko‘plab taniqli insonlar ham disleksik bo‘lganlar. Leonardo da Vinchi, Eynshteyn, Stiv Jobs kabilar bolaligida disleksiyaga chalingani haqida aytib o‘tishgan. Disleksiya ko‘p hollarda avloddan-avlodga o‘tadi[3].

Disleksiyaning belgilari odatda bolalik davrida namoyon bo‘lib, turli shakllarda bo‘lishi mumkin. Disleksiyaning asosiy belgilari quyidagilardan iborat:

1. Og‘zaki nutqdagi muammolar:

a) Harflarni ajratish va tanishda qiyinchilik;
b) So‘zlarni noto‘g‘ri o‘qish yoki gapdagi ba`zi so‘zlarni tushirib qo‘yish;
c) O‘qish tezligining pastligi va o‘qigan narsani tushunishda qiyinchilik;
d) Gapirishni kech o‘rganish;
e) So‘zlarni talaffuz qilishdagi qiyinchilik;
f) Ko‘rsatmalarga amal qilishda qiyinchilik;
g) Oldin/keyin, o‘ng/chap kabilarni adashtirish;
h) Alfavit, bolalar ritmikasi yoki qo‘shiqlarni o‘rganishda qiyinchilik;
i) Tushunchalar va munosabatlarni tushunishda qiyinchilik;
j) So‘z tanlash yoki nomlash bilan bog‘liq qiyinchiliklar.

2. O‘qish bilan bog‘liq muammolar:

a) O‘qishni o‘rganishda qiyinchilik;
b) Ritmli so‘zlarni aniqlash va hosil qilishda yoki so‘zlardagi bo‘g‘inlar sonini sanashda qiyinchilik;
c) So‘zlardagi tovushlarni eshitish va boshqarishda qiyinchilik;
d) So‘zlardagi turli tovushlarni farqlashda qiyinchilik;
e) Harf tovushlarini o‘rganishda qiyinchilik;
f) Harflarning nomlari va shakllarini eslab qolishdagi qiyinchilik;
g) O‘qish yoki yozishda harflar tartibini to‘g‘rilash;
h) Ko‘p qo‘llanadigan qisqa so‘zlarni tushirib qoldirish yoki xato o‘qish;
i) Uzunroq so‘zlarni o‘qiy olmaslik;
j) Ovoz chiqarib yoki jim o‘qigan paytda ko‘pincha so‘zlar to‘g‘ri o‘qilmaganligi sababli o‘qib yaxshi tushunmaslik;
k) Ovoz chiqarib o‘qiganda sekin va qiyinchilik bilan o‘qish.

3. Yozma nutqdagi muammolar:

a) Fikrlarni qog‘ozga tushirishda qiyinchilik;
b) Ko‘p imlo xatolari;

[2] bookstore@dyslexiaida.org
[3] Azimov, U., & Makhmudov, K. (2021). Effective Teaching Methods for Dyslexic Students in Uzbekistan. *Journal of Special Education Research*, 12(2), 112

c) Xatolarni tekshirishdagi qiyinchilik.

4. Disleksiya bilan yuzaga keladigan boshqa keng tarqalgan belgilar
a) Ranglarni, narsalarni va harflarni ketma-ketlikda tezlik bilan nomlashda qiyinchilik;
b) Ro‘yxatlar, yo‘nalishlar yoki faktlarni eslab qolishdagi qiyinchilik;
c) Tushuncha va terminlarni o‘rganish bilan bog‘liq muammolar;
d) Ko‘rish yoki eshitib o‘rganishdagi qiyinchilik;
e) Turli testlar yoki maktab imtihonlarida natijaning past bo‘lishi;
f) Maktab faoliyatida nomutanosiblik [4] .

Zero, bu muammolar o‘z vaqtida aniqlansa va turli lingvistik metodlardan foydalangan holda to‘g‘ri yondashilsa , bu muammolar oldi olinadi. O‘zbek tilida so‘zlashuvchi bolalarda disleksiya bilan bog‘liq muammolarni hal qilishda lingvistik yondashuv juda samarali, chunki o‘zbek tilining o‘ziga xos xususiyatlarini inobatga olgan holda maxsus metodlar ishlab chiqish mumkin.
O‘zbek tilida so‘zlashuvchi bolalarda disleksiya belgilarini aniqlash va ularni to‘g‘ri anglab yetish uchun quyidagi omillarni ko‘rib chiqish kerak:
1. Fonologik muammolar:
Harflarni talaffuz qilish va farqlashda qiyinchiliklar;
Turli fonemalarni ajratishda va o‘qishda muammolar (masalan, jarangli va jarangsiz undoshlar orasidagi farq).
2. Morfologik va sintaktik xatolar:
a) So‘zlarni noto‘g‘ri shakllantirish va ulardan noto‘g‘ri foydalanish;
b) Gaplar tuzilishida va ularning to‘g‘ri tartibini aniqlashda qiyinchiliklar.
3. Yozuv va imlo xatolari:
a) So‘zlarni noto‘g‘ri yozish yoki harflarni almashtirib yuborish (masalan, "d" va "t" harflarini adashtirish);
b) Imlo qoidalarini tushunishda va qo‘llashda qiyinchiliklar.
O‘zbek tilida so‘zlashuvchi bolalarda disleksiya bilan bog‘liq muammolarni hal qilishda quyidagi lingvistik metodlardan foydalanish zarur:
a) Harflar va so‘zlarni o‘rganishda ko‘rish, eshitish va sezish kabi turli his-tuyg‘ularni jalb qilish. Masalan, harflarni qo‘l bilan shakllantirish, ularni talaffuz qilish va eshitish orqali o‘rganish.
b) Maxsus o‘quv dasturlari va materiallarni ishlab chiqish, o‘qituvchilar va ota-onalar uchun o‘quv qo‘llanmalari va yo‘riqnomalarni taqdim etish.
c) Har bir bolaning ehtiyojlariga mos individual yondashuv va mashg‘ulotlarni o‘tkazish, bolaning qiyinchilik darajasiga qarab maxsus mashqlar va metodlarni qo‘llash
d) Maktabgacha yoshdagi bolalarni o‘qish va yozishga o‘rgatish uchun maxsus dasturlarni qo‘llash, disleksiyaning ilk belgilarini aniqlash va erta bosqichda mutaxassislar bilan maslahatlashish.
e) Oilaviy muhitda qo‘llab-quvvatlash va rag‘batlantirish, uyda o‘qish va yozish bo‘yicha kundalik mashqlarni o‘tkazish.
f) Disleksiyaga uchragan bolalar uchun maxsus dasturlar va texnologik vositalardan foydalanish (masalan, audio kitoblar, matnni ovozga aylantiruvchi dasturlar).
Xulosa qilib aytganda, o‘zbek tilida so‘zlashuvchi bolalarda disleksiya muammosini hal qilishda lingvistik yondashuv samarali natijalar beradi. Bu yondashuv fonetik, morfologik, sintaktik va yozuv bilan bog‘liq qiyinchiliklarni aniqlash va ularni hal qilish uchun maxsus metodlarni qo‘llashni talab qiladi. Bolalardagi disleksiya muammosiga erta tashxis qo‘yish, maxsus ta'lim dasturlari va individual yondashuv bolalarga disleksiya bilan bog‘liq qiyinchiliklarni yengishda yordam beradi.

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Mechanisms For Linking Learned Information With Practice

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Abstract
This article discusses the fact that the lack of connection of theoretical knowledge learned in higher education with practice is one of the main factors reducing the quality of education, and that in order to connect the learned information with practice, it is important to strengthen the practical content of educational programs. It also highlights one of the biggest problems related to practice in the conditions of Uzbekistan - the general relationship between the production sector and the education system

Annotatsiya
Ushbu maqolada oliy ta’limda o‘rganilgan nazariy bilimlarning amaliyotga bog‘lanmaganligi ta’lim sifatini pasaytiruvchi asosiy omillardan biri ekanligi hamda o‘rganilgan ma’lumotlarni amaliyot bilan bog‘lashda eng avvalo**,** ta’lim dasturlarining amaliy mazmunini kuchaytirish muhim ahamiyat ega ekanligi haqida so‘z boradi. Shuningdek O‘zbekiston sharoitida amaliyot bilan bog‘liq eng katta muammolardan biri – ishlab chiqarish sektori va ta’lim tizimi o‘rtasidagi umumiy munosabatlar yoritilgan

Kirish

Zamonaviy oliy ta’limning asosiy vazifasi – nazariy bilimlar bilan amaliy tajriba o‘rtasida uzviy aloqani ta’minlab, talabalarni real hayotga tayyorlashdir. Ta’lim sifatini oshirishda o‘rganilgan nazariy bilimlarning amaliyot bilan bog‘lanmasligi talabalar tayyorlashda asosiy zaif jihatlardan biri sifatida e’tirof etiladi. Bu muammo nafaqat ta’lim mazmunining eskirib qolganligi, balki o‘quv jarayonining amaliyotdan uzilib qolganligi, ishlab chiqarish bilan hamkorlikning sustligi va amaliy kompetensiyalarga yetarli e’tibor berilmasligi bilan izohlanadi. Shu sababli, oliy ta’limda ta’lim mazmuni va amaliy faoliyat o‘rtasida integratsiyani ta’minlashga xizmat qiluvchi aniq, tizimli va barqaror mexanizmlarni ishlab chiqish dolzarb vazifaga aylangan.

O‘rganilgan ma’lumotlarni amaliyot bilan bog‘lashda eng avvalo**,** ta’lim dasturlarining amaliy mazmunini kuchaytirish muhim ahamiyat kasb etadi. Ta’lim dasturlarini ishlab chiqishda faqat nazariy fanlar emas, balki kasbiy modullar, laboratoriya ishlari, seminar mashg‘ulotlari, keyslar va amaliy topshiriqlar ulushi oshirilishi zarur. Bu esa talabaning bilimni mustaqil o‘zlashtirishini, uni qo‘llashni, tahlil qilishni, real vaziyatlarga tatbiq eta olishini shakllantiradi. Masalan, iqtisod yo‘nalishida o‘qiyotgan talaba nafaqat iqtisodiy nazariyalarni bilishi, balki bozor tahlilini amalga oshira olishi, investitsiya loyihalari tuzishi yoki biznes-rejalarni hisoblab chiqishi kerak.

Ikkinchi muhim mexanizm — duallashtirilgan (dual) ta’lim modelini keng joriy etishdir. Bu modelda talaba haftaning ma’lum kunlarida ta’lim muassasasida nazariy bilimlarni oladi, qolgan kunlarida esa ishlab chiqarishda, korxona yoki tashkilotda amaliyot o‘taydi. Bu model Germaniya, Avstriya, Shveytsariya kabi davlatlarda juda samarali bo‘lib, O‘zbekistonda ham ayrim texnik va pedagogik yo‘nalishlarda joriy etila boshladi. Dual ta’lim orqali talaba nazariy bilimni bevosita amaliyotga tatbiq qilishni o‘rganadi, bu esa uning kasbiy tayyorgarligini kuchaytiradi va bitirgach darhol ishga moslashishiga yordam beradi.

Uchinchi mexanizm sifatida kafedra va ishlab chiqarish o‘rtasida doimiy hamkorlik asosida ishlaydigan sanoat hamkorlik markazlarini tashkil etish mumkin. Bunday markazlar korxona, tashkilot, ta’lim muassasasi va talabalar o‘rtasida uzluksiz aloqani ta’minlaydi. Markazlar orqali ishlab chiqarishdagi dolzarb muammolar asosida ilmiy loyihalar, tadqiqotlar, amaliy topshiriqlar shakllantiriladi va bu jarayonga talabalar jalb etiladi. Bu orqali talaba nafaqat bilim oladi, balki real sektor muammolarini hal etishda ishtirok etadi, ijodiy fikrlaydi va tadqiqot olib borishga qiziqadi.

Shuningdek, ta’lim mazmuniga startaplar, innovatsion laboratoriyalar va loyihaviy ta’lim elementlarini kiritish ham nazariy bilim va amaliyot o‘rtasidagi bo‘shliqni to‘ldiradi. Har bir yo‘nalish bo‘yicha loyiha asosida dars tashkil etish, “Case-study” metodidan foydalanish, talabaning innovatsion g‘oyalarini aniqlash va rivojlantirishga yo‘naltirilgan ta’lim – bu zamonaviy ta’limda samaradorlikni ta’minlovchi eng muhim vositalardan biridir. O‘zbekistonda faoliyat yuritayotgan inkubatsiya markazlari, yoshlar texnoparklari, “startap-week” loyihalari orqali bu yo‘nalishlarda ijobiy natijalar kuzatilmoqda.

Ta’lim va amaliyot integratsiyasining muhim tarkibiy qismi – mentorlik tizimidir. Har bir talaba real ishchi mutaxassis – mentor rahbarligida amaliy topshiriqlarni bajarsa, u nazariy bilimni to‘g‘ridan-to‘g‘ri kasb faoliyatiga bog‘laydi. Mentorlar, shuningdek, talabaga bozor talablariga mos ko‘nikmalar, mas’uliyat, jamoada ishlash qobiliyatini singdiradi.

Yana bir zaruriy mexanizm — ta’lim jarayoniga ish beruvchilarni faol jalb etishdir. Ular ta’lim dasturlarining mazmunini ishlab chiqishda ishtirok etishi, seminar va darslarda qatnashishi, talabalarning baholash mezonlarini taklif qilishi ta’limning bozor bilan uyg‘unligini kuchaytiradi. Bu usul AQSh va Singapurda keng qo‘llaniladi. O‘zbekistonda esa hozircha ish beruvchilar ko‘proq diplomli kadrlarni kutib olishda ishtirok etmoqda, biroq ta’lim jarayonining o‘zida ularning ishtiroki cheklangan. Bu boradagi huquqiy va tashkiliy mexanizmlarni mustahkamlash zarur.

Ta’limni amaliyot bilan bog‘lashda yana bir muhim mexanizm — modul-kredit tizimida mustaqil ta’lim soatlarining mazmunli tashkil etilishidir. Mustaqil ta’lim faqat nazariy materialni o‘zlashtirishga emas, balki talabaning amaliy faoliyatga yo‘naltirilgan topshiriqlarni bajarishiga xizmat qilishi kerak. Masalan, soha bo‘yicha video tahlil qilish, kuzatuv olib borish, tahliliy hisobot tayyorlash, keyslar ishlab chiqish, joylardagi ijtimoiy muammolarga echim taklif qilish kabi faoliyatlar orqali talaba o‘rganilgan nazariyani hayotiy sharoitga bog‘laydi.

Xulosa qilib aytganda, oliy ta’limda o‘rganilgan nazariy bilimlarning amaliyotga bog‘lanmaganligi ta’lim sifatini pasaytiruvchi asosiy omillardandir. Bu muammoni bartaraf etish uchun ta’lim mazmunini qayta ko‘rib chiqish, dual modelni joriy etish, sanoat bilan hamkorlikni kuchaytirish, loyihaviy ta’lim va startap madaniyatini rivojlantirish, ish beruvchilar va mentorlarni ta’limga faol jalb qilish kabi tizimli mexanizmlar zarur. Faqat shundagina ta’lim samaradorligi ortadi, bitiruvchilar real muammolarni hal eta oladigan, raqobatbardosh va mustaqil fikrlovchi mutaxassisga aylanishi mumkin.

Amaliyotga yo‘naltirilgan ta’limni samarali tashkil etish uchun nafaqat tashkiliy mexanizmlar, balki didaktik va metodologik asoslar ham chuqur qayta ko‘rib chiqilishi kerak. O‘qituvchilarning dars berish uslublari, fan dasturlarining kompetensiyaga yo‘naltirilganlik darajasi, ta’limdagi maqsad-vazifalarning o‘zgarishi talabaning faqat bilim emas, balki muammoni hal qila oladigan shaxs sifatida shakllanishini ta’minlaydi. Shu bois o‘rganilgan bilimlar real hayotdagi muammolarga tatbiq etiladigan qilib rejalashtirilgan bo‘lishi lozim.

Yevropa oliy ta’lim makonida qo‘llanilayotgan “learning outcome-based education” (natijaga yo‘naltirilgan ta’lim) konsepsiyasi shuni ko‘rsatadiki, ta’lim jarayoni mazmuni, baholash vositalari va pedagogik yondashuvlar talabaning haqiqiy kasbiy kompetensiyalarini shakllantirishga xizmat qilishi kerak. Ya’ni, har bir bilim birligi yakunida talaba nimalarga qodir bo‘lishi, qanday muammolarni hal qila olishi, qanday axborot bilan mustaqil ishlashi aniq belgilanadi. Bu yondashuv O‘zbekistonda ham bosqichma-bosqich kredit-modul tizimi orqali joriy qilinmoqda, biroq hozircha bu model ko‘proq tashkiliy jihatdan qo‘llanilmoqda, mazmuniy jihatdan esa hali to‘liq kompetensiyaga asoslanmagan.

Bundan tashqari, o‘rganilgan ma’lumotlarning amaliyot bilan uyg‘unlashuvini ta’minlashda muammo asosida o‘qitish (problem-based learning – PBL) yondashuvi muhim o‘rin tutadi. Bu metodda o‘qituvchi tayyor bilim emas, balki muammoni taqdim etadi. Talaba esa o‘z guruhdoshlari bilan birgalikda tahlil, izlanish, eksperiment yoki keys asosida echim topadi. Bu jarayon talabada nafaqat kasbiy bilim, balki tanqidiy fikrlash, kommunikativ ko‘nikma, mustaqil

qaror qabul qilish va liderlik kabi sifatlarni shakllantiradi. Amaliyotga tayyor mutaxassis aynan shunday kompetensiyalarga ega bo‘lishi kerak.

Xalqaro tajribalarda, xususan, Finlyandiya, Kanada, Janubiy Koreya va Singapurda o‘quv dasturlarida amaliy faoliyatni kuchaytirish uchun portfolio asosida baholash, kompetensiyalar xaritasi, interaktiv treninglar, interfaol simulyatsiya va laboratoriya muhitlari, yirik ishlab chiqarish korxonalari bilan shartnomaviy amaliyot kabi tizimlar keng joriy etilgan. Masalan, Koreyada "Smart Education Campus" loyihasi orqali har bir talabaning ta’lim yo‘li individual kompetensiyalar asosida raqamli portfellar bilan boshqariladi. Bu esa bilim, ko‘nikma va tajribaning uzviy bog‘liqligini mustahkamlaydi.

Shu bilan birga, O‘zbekiston sharoitida amaliyot bilan bog‘liq eng katta muammolardan biri – ishlab chiqarish sektori va ta’lim tizimi o‘rtasidagi uzilishdir. Ko‘plab universitetlar sanoat korxonalari bilan real va tizimli hamkorlikka ega emas. Talabalar amaliyotni faqat hujjat shaklida yoki qisqa muddatda, yuzaki tarzda o‘tashadi. Bu esa kasbiy tayyorgarlik darajasiga salbiy ta’sir qiladi. Mazkur muammoni hal etish uchun ta’lim va mehnat bozori o‘rtasida strategik sheriklik o‘rnatish, OTMlar qoshida innovatsion ishlab chiqarish klasterlari tashkil etish, talabalarni loyihalar va grantlar asosida real muammolarga yo‘naltirish lozim.

O‘rganilgan bilimlarning amaliyot bilan bog‘lanishida yana bir e’tiborga molik yondashuv – multidissiplinar va fanlararo integratsiyani ta’minlashdir. Amaliy muammolar odatda birgina mutaxassislik doirasida yechilmaydi. Shuning uchun talaba o‘z sohasidagi bilimlarni boshqa yo‘nalishlardagi asosiy tushunchalar bilan bog‘lay olishi kerak. Masalan, ijtimoiy fanlar talabasi raqamli savodxonlikni, texnik yo‘nalishdagi talaba esa ijtimoiy kommunikatsiyalarni bilishi zamonaviy kompetensiyalar to‘plamini shakllantirish uchun zarurdir. O‘quv dasturlarining turli yo‘nalishlar bilan kesishadigan modullar orqali boyitilishi ham amaliyotga yaqinlikni oshiradi.

Shuningdek, bugungi kunda o‘qituvchilar oldida turgan muhim vazifa – bilimni taqdim qilishdan ko‘ra, uni kontekstga joylashtirishdir. Ya’ni, o‘quv materiallarini jamiyatdagi real vaziyatlar, sohadagi dolzarb ehtiyojlar, talabalar hayotiy tajribasi bilan bog‘lab berish zarur. Shu orqali bilim abstrakt tushuncha emas, balki talabaning shaxsiy rivojlanishiga xizmat qiluvchi resursga aylanadi. Masalan, marketing fanida faqat nazariy tushunchalarni emas, balki o‘zbek brendlari, mahalliy bozordagi tendensiyalar, iste’molchilarning xulq-atvori haqidagi real ma’lumotlar asosida o‘quv topshiriqlari tuzish kerak.

Xulosa

Xulosa sifatida aytish mumkinki, o‘rganilgan bilimlarni amaliyot bilan bog‘lash oliy ta’limda sifatni oshirishning strategik yo‘nalishidir. Bu jarayon faqat amaliyot muddati yoki ishlab chiqarishdagi stajirovkani nazarda tutmaydi.

U butun ta’lim jarayonini amaliy muhitga yo‘naltirish, ta’lim metodikasi va didaktik vositalarni amaliy faoliyat asosida shakllantirish, baholash mezonlarini kasbiy ko‘rsatkichlarga yaqinlashtirish, talabaning shaxsiy va ijtimoiy faolligini oshirishni o‘z ichiga oladi. O‘zbekistonda bu yo‘nalishdagi islohotlar boshlangan bo‘lsa-da, ularni chuqurlashtirish, ilg‘or xorijiy tajriba bilan uyg‘unlashtirish, akademik erkinlikni kuchaytirish va mehnat bozori bilan integratsiyani mustahkamlash orqali yanada samarali ta’lim muhitini shakllantirish mumkin bo‘ladi.

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Strategy For Forming International Cooperation Indicators For The Participation Of Uzbekistan's Higher Educational Institutions In International Rankings (Qs, The)

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Abstract
This article highlights the need to develop international cooperation indicators to enhance the participation of Uzbek higher education institutions (HEIs) in international rankings (in particular, QS World University Rankings and Times Higher Education). The study analyzed international cooperation indicators based on international rating methodologies, existing HEI practices, and best foreign practices. The analysis shows that the high ranking of HEIs in international rankings is directly related to their indicators such as international academic cooperation, scientific projects, and the share of foreign professors and students. The article proposes strategic approaches, digital monitoring systems, and sustainable financial mechanisms for HEIs to develop international cooperation.
Keywords: higher education, international ranking, QS, THE, international cooperation, indicator, strategy.
Annotatsiya
Mazkur maqolada O‘zbekiston oliy ta‘lim muassasalarining (OTM) xalqaro reytinglarda (xususan, QS World University Rankings va Times Higher Education) ishtirokini kuchaytirishda xalqaro hamkorlik ko‘rsatkichlarini shakllantirish zarurati yoritilgan. Tadqiqot doirasida xalqaro reyting metodologiyalari, mavjud OTM amaliyoti va ilg‘or xorijiy tajribalar asosida xalqaro hamkorlik indikatorlari tahlil qilindi. Tahlillar shuni ko‘rsatadiki, OTMlarning xalqaro reytinglarda yuqori o‘rin egallashi bevosita ularning xalqaro akademik hamkorlik, ilmiy loyihalar, xorijiy professorlar va talabalar ulushi kabi ko‘rsatkichlari bilan bog‘liq. Maqolada OTMlar uchun xalqaro hamkorlikni rivojlantirishga qaratilgan strategik yondashuvlar, raqamli monitoring tizimlari va barqaror moliyaviy mexanizmlar taklif etiladi.
Kalit so‘zlar: oliy ta‘lim, xalqaro reyting, QS, THE, xalqaro hamkorlik, indikator, strategiya

Kirish

O‘zbekiston oliy ta’lim tizimining xalqaro maydondagi faolligi so‘nggi yillarda sezilarli darajada ortib bormoqda. Bu jarayon mamlakatda amalga oshirilayotgan chuqur islohotlar, ta’lim sifati va boshqaruv samaradorligini oshirishga qaratilgan strategik qarorlar, shuningdek, xalqaro hamjamiyat bilan integratsiyalashuv borasidagi qat’iy siyosiy iroda bilan chambarchas bog‘liqdir. Ayniqsa, 2021-yildan boshlab davlat siyosatida oliy ta’lim muassasalarining xalqaro reytinglardagi ishtiroki alohida ustuvorlik sifatida belgilandi. Bu esa oliy ta’lim muassasalarining tashqi aloqalarni rivojlantirishdan tashqari, xalqaro standartlarga mos transformatsiyasini ham talab etmoqda.

Xalqaro reytinglarda ishtirok etish – bu shunchaki statistik ko‘rsatkichlar yig‘indisi emas, balki universitetlar faoliyatining barcha jabhalarini, xususan ilmiy-tadqiqot, akademik hamkorlik, kadrlar salohiyati, innovatsion infratuzilma va boshqaruv tizimini chuqur tahlil qiladigan murakkab baholash jarayonidir. Bu baholashda xalqaro hamkorlik darajasi alohida ahamiyat kasb etadi. QS (Quacquarelli Symonds) va THE (Times Higher Education) kabi dunyodagi nufuzli reyting tizimlari aynan xalqaro ko‘rsatkichlarni strategik ustuvor mezon sifatida belgilagan.

Jumladan, QS reytingi bo‘yicha xorijiy talabalarning umumiy talaba soniga nisbati, xalqaro professor-o‘qituvchilar ulushi, akademik obro‘ va xalqaro ilmiy maqolalarning iqtiboslanish darajasi muhim indikator hisoblanadi. THE reytingida esa “International Outlook” yo‘nalishi doirasida xalqaro talabalar va xodimlar foizi, xalqaro hamkorlikda chop etilgan ilmiy maqolalar soni va xalqaro hamkorlik bo‘yicha tuzilgan kelishuvlar chuqur tahlil qilinadi. Bu mezonlarning barchasi OTMlar qanchalik darajada xalqaro ilmiy va akademik muhitga integratsiyalashganini ko‘rsatadi.

Shu bois, O‘zbekiston OTMlari uchun xalqaro reytinglarda ishtirok etishning eng muhim omillaridan biri — xalqaro hamkorlikni izchil, tizimli va strategik asosda rivojlantirishdan iboratdir. Ushbu maqola aynan xalqaro hamkorlik ko‘rsatkichlarini shakllantirish strategiyalarini o‘rganishga, ularni xalqaro reytinglar kontekstida baholash va takomillashtirishga qaratilgan bo‘lib, O‘zbekiston oliy ta’lim muassasalari uchun amaliy va nazariy jihatdan dolzarb masalalarni yoritishga xizmat qiladi.

Adabiyotlar tahlili

Xalqaro reytinglarda ishtirok etish bo‘yicha universitetlar o‘rtasidagi raqobat global miqyosda kuchayib borar ekan, ilmiy adabiyotlarda bu jarayonni qo‘llab-quvvatlovchi institutsional strategiyalar va xalqaro hamkorlik ko‘rsatkichlari tobora ko‘proq e’tibor markaziga aylanmoqda. Zamonaviy tadqiqotlarda xalqaro hamkorlik faqat tashriflar yoki qo‘shma dasturlar doirasida emas, balki universitetning strategik taraqqiyoti, ilmiy salohiyati va global raqobatbardoshligini belgilovchi muhim omil sifatida qaralmoqda.

Masalan, Knight (2004)[1] xalqaro komponentlarni oliy ta’lim muassasasining ichki siyosati va rejalashtirish tizimi bilan chambarchas bog‘lagan holda ko‘rib chiqadi. Uning fikricha, xalqaro ko‘rsatkichlar universitetning tashqi imijini emas, balki ichki resurslar boshqaruvi, akademik sifat va global sheriklik qobiliyatini namoyon etadi. Shu boisdan, universitetlar reytinglarda ishtirok etishni oddiy tashqi aloqalarga emas, balki ichki strategik boshqaruvga asoslangan jarayon sifatida yo‘lga qo‘yishlari kerak.

Marginson (2019)[2] esa xalqaro hamkorlikni “institutsional transformatsiya” omili sifatida baholaydi. U xalqaro reytinglar talab qiladigan indikatorlarning faqat statistik o‘lchov emas, balki oliy ta’lim muassasasining madaniy ochiqligi, akademik muhit sifati va global bilim aylanishidagi o‘rnini ko‘rsatuvchi belgi ekanligini ta’kidlaydi. Bunday yondashuvdan kelib chiqib, ko‘plab yetakchi davlatlar — Xitoy, Janubiy Koreya, Polsha, Malayziya — o‘z universitetlarida reytinglarga mos xalqaro indikatorlar to‘plamini ishlab chiqqan va bu mezonlarni ichki monitoring tizimlariga integratsiya qilgan. Masalan, Janubiy Koreya hukumati tomonidan universitetlarning xalqaro maqolalari soni, chet ellik talabalar ulushi va xalqaro grantlarda ishtiroki har chorakda baholanadi va tegishli moliyaviy rag‘batlar bilan bog‘lanadi.

Polsha va Malayziya tajribasida esa xalqaro hamkorlik bo‘yicha maxsus ofislar tashkil qilinib, ular nafaqat aloqalarni rivojlantirish, balki reyting indikatorlari bo‘yicha ma’lumotlarni yig‘ish va tahlil qilish bilan shug‘ullanadi. Bu orqali xalqaro ko‘rsatkichlar bo‘yicha ichki axborot tizimlari shakllantirilgan.

O‘zbekiston kontekstida esa xalqaro hamkorlik bo‘yicha ko‘plab tashabbuslar mavjud bo‘lsa-da, hali yagona milliy indikatorlar to‘plami ishlab chiqilmagan. QS yoki THE reytinglarida ishtirok etayotgan ba’zi universitetlar (masalan, O‘zMU yoki TATU) o‘z ichki monitoring tizimlarini shakllantirishga harakat qilmoqda, biroq bu yondashuvlar aksariyat hollarda umumlashtirilgan shaklda qolmoqda. Bu esa xalqaro ko‘rsatkichlarni aniq strategik maqsadlar va monitoring tizimiga asoslangan holda shakllantirish zaruratini yuzaga keltiradi.

Shu sababli, xalqaro tajribalar tahlili shuni ko‘rsatadiki, reyting mezonlariga mos xalqaro ko‘rsatkichlarni belgilash va ularga erishishni boshqarish uchun OTMlarda raqamli axborot tizimlariga asoslangan, strategik rejalashtirilgan, samarali institutlararo mexanizmlar zarur.

[1] Knight, J. (2004). Internationalization remodeled: Definition, approaches, and rationales. *Journal of Studies in International Education*, **8**(1), 5–31. https://doi.org/10.1177/1028315303260832

[2] Marginson, S. (2019). Limitations of human capital theory. *Studies in Higher Education*, **44**(2), 287–301. https://doi.org/10.1080/03075079.2017.1359823

Ushbu maqolaning keyingi bo‘limlari aynan ana shu mexanizmlarni shakllantirish yo‘llarini tahlil qiladi.

Metodologiya

Ushbu tadqiqotda O‘zbekiston oliy ta’lim muassasalarining xalqaro reytinglardagi ishtirokini kuchaytirish maqsadida xalqaro hamkorlik indikatorlarini shakllantirishga oid real holatni tahlil qilish va strategik yondashuvlar ishlab chiqish uchun kompleks metodlar qo‘llanildi. Tanlangan metodologik yondashuvlar mavzuning murakkab va ko‘p qirrali xarakterini inobatga olgan holda tanlab olindi.

Avvalo, QS World University Rankings va Times Higher Education (THE) reyting tizimlarida xalqaro hamkorlik bilan bog‘liq indikatorlar — xorijiy talabalar ulushi, xalqaro ilmiy maqolalar soni, chet ellik professor-o‘qituvchilar miqdori, xalqaro grantlar va qo‘shma loyihalar kabi mezonlar — kontent tahlili asosida o‘rganildi. Bu tahlil ushbu indikatorlarning har bir reyting tizimidagi vazni va baholash mexanizmlarini aniqlash imkonini berdi.

Keyingi bosqichda, O‘zbekistonning 3 ta yirik OTMida — jumladan, O‘zbekiston Milliy universiteti, TATU, Toshkent davlat iqtisodiyot universiteti va boshqa oliy ta’lim muassasalarida — xalqaro aloqalar bo‘yicha bo‘lim rahbarlari bilan yarim strukturaviy intervyular o‘tkazildi. Intervyular orqali xalqaro hamkorlikni boshqarishdagi amaliy tajriba, mavjud cheklovlar, indikatorlarni shakllantirishdagi muammolar va ichki tartibotlar haqida batafsil ma’lumotlar olindi. Suhbatlar davomida ishtirokchilarning fikrlari tematik kodlash asosida tahlil qilindi.

Tadqiqotda, shuningdek, Qozog‘iston, Vengriya va Janubiy Koreya kabi mamlakatlardagi yetakchi universitetlarning xalqaro hamkorlik strategiyalari va reyting indikatorlariga oid hujjatlari o‘rganildi. Bu orqali ushbu mamlakatlar tomonidan qo‘llanilayotgan institutlashtirilgan yondashuvlar, axborot tizimlari, monitoring mexanizmlari va davlat qo‘llab-quvvatlovi tahlil qilindi. Mazkur tajribalar O‘zbekiston konteksti uchun amaliy jihatdan taqqoslanadigan model sifatida tanlandi.

Yakunda, O‘zbekiston OTMlarida xalqaro reyting indikatorlarini shakllantirishdagi mavjud imkoniyatlar, zaif jihatlar, tashqi xavflar va ichki resurslar SWOT tahlil asosida baholandi. SWOT natijalari asosida strategik yondashuvlar ishlab chiqish uchun zarur bo‘lgan muhim asosiy faktorlar ajratib olindi.

Mazkur metodologiya yordamida tadqiqot mavzusi kompleks tarzda tahlil qilindi, indikatorlarni amaliyotga tatbiq etish yo‘llari nazariy va empirik jihatdan asoslab berildi.

Natijalar va muhokama

Tadqiqot davomida o‘tkazilgan kontent tahlil, intervyular va taqqoslama tahlillar asosida aniqlanishicha, O‘zbekiston oliy ta’lim muassasalarida xalqaro reytinglardagi ishtirokni ta’minlovchi xalqaro hamkorlik indikatorlari bo‘yicha bir qator tizimli muammolar mavjud.

Quyidagi jadval ushbu muammolarni umumlashtirilgan tarzda aks ettiradi:

Muammo	**Tavsif**
Strategik rejaning yo‘qligi	Xalqaro reyting mezonlariga mos indikatorlar asosida ishlab chiqilgan aniq strategik maqsadlar mavjud emas
Ma’lumotlar monitoringi sustligi	Xalqaro ko‘rsatkichlar (xorijiy talabalar, professorlar, maqolalar) bo‘yicha muntazam avtomatlashtirilgan monitoring tizimlari shakllanmagan
Kadrlar salohiyatining pastligi	Reyting indikatorlarini yuritish va tahlil qilish malakasiga ega xodimlar yetishmaydi
Moliyaviy vositalarning yetishmasligi	Xorijiy professor-o‘qituvchilarni jalb etish, xalqaro grantlarni amalga oshirish uchun zarur moliyaviy mexanizmlar cheklangan

Shu bilan birga, ayrim OTMlar faoliyati ijobiy tajribalarni namoyon etmoqda. Masalan, Toshkent axborot texnologiyalari universiteti (TATU)da xalqaro hamkorlik asosida Scopus bazasidagi maqolalar soni ortib bormoqda. Toshkent davlat iqtisodiyot universiteti esa xorijiy talaba ulushi bo‘yicha milliy miqyosda yetakchilardan biri hisoblanadi. Bunday ilg‘or tajribalar xalqaro

ko‘rsatkichlarni tizimlashtirish va samarali boshqaruv vositalari mavjud bo‘lsa, reyting ko‘rsatkichlarini oshirish mumkinligini isbotlaydi.

Ushbu muhokama xalqaro reyting indikatorlarini faqat tashqi ko‘rinish emas, balki OTM ichki strategiyasiga chuqur integratsiyalash zarurligini ko‘rsatadi. Ayniqsa, indikatorlarni monitoring qilish, ularni raqamlashtirish va natijaviylikni baholash tizimini shakllantirish xalqaro tan olinuvchanlikni oshiruvchi asosiy omillardan biri sifatida qaralmoqda.

Xulosa va takliflar

O‘zbekiston oliy ta’lim muassasalarining xalqaro reytinglarda (xususan, QS va THE) barqaror ishtiroki va yuqori o‘rinlarni egallashi, eng avvalo, xalqaro hamkorlik faoliyatining sifatli tashkil etilishi hamda reyting mezonlariga mos indikatorlarning aniq shakllantirilgan bo‘lishiga bog‘liq. Tadqiqot davomida aniqlangan muammolar – strategik rejaning yo‘qligi, ma’lumotlar monitoringining sustligi, malakali kadrlar tanqisligi va moliyaviy cheklovlar – bu jarayonni tizimli yondashuv asosida takomillashtirish zarurligini ko‘rsatdi.

Xalqaro tajriba shuni anglatadiki, universitetlar o‘z xalqaro hamkorlik faoliyatini faqat tashqi aloqalar doirasida emas, balki strategik boshqaruvning ajralmas qismi sifatida tashkil etgan taqdirdagina reytinglarda sezilarli natijalarga erisha oladi. Bunday yondashuv, nafaqat universitet nufuzini oshiradi, balki ilmiy-innovatsion salohiyat, akademik mobillik va xalqaro moliyaviy resurslardan foydalanish imkoniyatlarini ham kengaytiradi.

Tadqiqot natijalariga asoslanib, quyidagi strategik takliflar ishlab chiqildi:

✓ **Xalqaro indikatorlarni aniqlash va strategik integratsiya qilish**. Har bir OTM o‘zining xalqaro rivojlanish strategiyasida reyting mezonlariga mos indikatorlarni (xorijiy talabalar soni, xorijiy professor-o‘qituvchilar ulushi, xalqaro ilmiy maqolalar soni, qo‘shma ilmiy loyihalar, xalqaro grantlar va dasturlar ishtiroki) aniq belgilashi, ularni yillik rejalashtirish va baholash tizimiga integratsiya qilishi zarur. Bu indikatorlar asosida reytinglarga yo‘naltirilgan ichki tahliliy monitoring tizimi shakllanishi kerak.

✓ **Raqamli monitoring tizimlarini joriy etish**. Zamonaviy OTMlar uchun xalqaro faoliyat ko‘rsatkichlarini kuzatish va hisobot berishning avtomatlashtirilgan, raqamli platformalari zarur. Bunday tizimlar — xalqaro shartnomalar, ilmiy hamkorlik loyihalari, akademik mobillik statistikasi, xorijiy talaba va o‘qituvchilar soni kabi ma’lumotlarni real vaqtda monitoring qilishga xizmat qiladi. Mazkur platformalar orqali OTMlar xalqaro reyting agentliklariga aniq va sifatli ma’lumot taqdim etish imkoniyatiga ega bo‘ladi.

✓ **Grant asosida xorijiy professor-o‘qituvchilarni jalb qilish**. OTMlar xorijiy tajribaga ega mutaxassislarni jalb qilish uchun maxsus grant dasturlari, stipendiyalar va infratuzilma imkoniyatlarini taklif qilishi zarur. Bu orqali ta’lim sifati oshadi, ilmiy nashrlar soni va sifati ortadi, o‘z navbatida bu omillar reyting ko‘rsatkichlariga bevosita ta’sir qiladi. Shu bilan birga, xorijiy o‘qituvchilar uchun qulay ish shartlari va ijtimoiy kafolatlar ham ishlab chiqilishi kerak.

✓ **Akademik mobillik va qo‘shma ilmiy loyihalarni kengaytirish**. Talaba va o‘qituvchilar almashinuvi, qo‘shma ilmiy tadqiqotlar, xalqaro konferensiyalar, ixtisoslashtirilgan yozgi maktablar — bularning barchasi xalqaro hamkorlik ko‘rsatkichlarini oshiradi. Har bir OTMda akademik mobillik va qo‘shma tadqiqot loyihalarini rag‘batlantiruvchi ichki normativ-huquqiy va moliyaviy mexanizmlar yaratilishi lozim. Shu bilan birga, akademik hamkorlikka yo‘naltirilgan alohida grant dasturlarini yo‘lga qo‘yish taklif etiladi.

✓ **Kadrlar salohiyatini oshirish**. Xalqaro hamkorlik sohasida ishlovchi xodimlar uchun muntazam treninglar, xalqaro grantlar yozish bo‘yicha seminarlar, akademik ingliz tili kurslari tashkil etilishi zarur. Bu bilan ularning reyting indikatorlarini to‘g‘ri shakllantirish va kuzatishdagi salohiyati oshadi. Ayniqsa, xalqaro akkreditatsiya, universitet brendingi va ilmiy diplomatiya bo‘yicha mutaxassislarni tayyorlash dolzarb masalalardan hisoblanadi.

✓ **Davlat siyosati va normativ asoslarning uyg‘unligi**. Oliy ta’lim muassasalarining xalqaro reytinglarda ishtirokini qo‘llab-quvvatlovchi yagona milliy yo‘l xaritasi va normativ asoslar ishlab chiqilishi lozim. Bu — vazirliklar, idoralar va OTMlar o‘rtasida muvofiqlashtirilgan strategik

yondashuvni ta’minlaydi. Xususan, xalqaro reyting mezonlariga mos OTM faoliyatini baholash indikatorlari milliy indikatorlar tizimiga kiritilishi maqsadga muvofiq.

Yakuniy xulosa

Umuman olganda, xalqaro reytinglarda muvaffaqiyatli ishtirok — bu alohida OTMlar tashabbusi emas, balki butun oliy ta’lim tizimi darajasida strategik va institutsional yondashuvni talab qiluvchi uzluksiz jarayondir. Strategik rejalashtirish, indikatorlarga asoslangan boshqaruv, raqamli yechimlar, grant siyosati va inson resurslarini rivojlantirish orqali O‘zbekiston OTMlari xalqaro reytinglarda munosib o‘rin egallashi va global akademik maydonda o‘z pozitsiyasini mustahkamlashi mumkin.

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Models Of Improving The Quality Of Education In World Experience

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Abstract
This research explores global models aimed at improving the quality of education, focusing on best practices implemented in developed countries such as the United States, Finland, South Korea, and Singapore. The study analyzes key aspects of these models, including effectiveness, innovative approaches, increasing the efficiency of the learning process, professional development of teachers, and improvement of assessment systems. It also examines the recommendations of international organizations such as UNESCO and OECD (particularly PISA assessments) in enhancing education quality. The paper concludes with proposals for adapting the most suitable international models to the context of the Uzbek education system.

Annotatsiya
Mazkur ilmiy ishda dunyo miqyosida ta’lim sifatini oshirish bo‘yicha qo‘llanilayotgan ilg‘or modellarning o‘rganilishi hamda ularning asosiy jihatlari tahlil qilingan. Rivojlangan davlatlar (AQSh, Finlyandiya, Janubiy Koreya, Singapur kabi) tajribasiga tayangan holda, ta’lim tizimida natijadorlik, innovatsion yondashuvlar, o‘quv jarayonining samaradorligini oshirish, o‘qituvchilarning malakasini rivojlantirish va baholash tizimlarini takomillashtirish kabi yo‘nalishlar yoritilgan. Shuningdek, xalqaro tashkilotlar – UNESCO, OECD (PISA baholashlari) va boshqa muassasalar tavsiyalari asosida ta’lim sifatini oshirishda qo‘llanilayotgan strategiyalar ko‘rib chiqilgan. Ish yakunida o‘zbek ta’lim tizimi uchun mos keladigan modellarni tanlab, ularni milliy kontekstda tatbiq etish bo‘yicha tavsiyalar berilgan.

KIRISH

Ta’lim sifati — bu har bir mamlakat uchun strategik ustuvor yo‘nalishdir. Bugungi globallashuv va raqamli transformatsiya sharoitida xalqaro hamjamiyat ta’limni rivojlantirishda bir qator model va mexanizmlarni sinovdan o‘tkazib, eng samarali yondashuvlarni amaliyotga joriy etmoqda. Xususan, AQSh, Finlyandiya, Janubiy Koreya, Singapur, Yaponiya va boshqa ilg‘or ta’lim tizimlariga ega davlatlar o‘z tajribasida ta’lim sifatini oshirish bo‘yicha kompleks, tizimli yondashuvlarga asoslangan model va mexanizmlarni ishlab chiqqan.

AQSh tajribasi: akkreditatsiyaga asoslangan sifat menejmenti

AQShda oliy ta’lim muassasalari uchun ta’lim sifati birinchi navbatda mustaqil akkreditatsiya agentliklari tomonidan baholanadi. Bu tizim o‘zining shaffofligi, tahliliy mexanizmlari va jamoatchilik nazorati bilan ajralib turadi. Har bir oliy ta’lim muassasasi bevosita o‘zining ichki sifat monitoring tizimiga ega bo‘lib, “Continuous Improvement” (doimiy takomillashtirish) modelini amal qilmoqda.

Bundan tashqari, ABET, AACSB, NEASC kabi tashkilotlar muhandislik, biznes va boshqa yo‘nalishlar bo‘yicha ta’lim sifatini baholaydi. Dasturlar mehnat bozori talablariga muvofiqligi, o‘qituvchilar salohiyati, talaba natijalari va innovatsion infratuzilmalar asosida reytinglanadi. Talabalarning mustaqil fikrlashi, innovatsion yechimlar ishlab chiqishi va jamiyatdagi ijtimoiy faolligi ham baholash mezoni hisoblanadi.

Finlyandiya modeli: ishonch, mustaqillik va individual yondashuv.

Finlyandiya ta’lim tizimi bugungi kunda jahonning eng barqaror va samarali tizimlaridan biri hisoblanadi. Bu mamlakatda ta’lim sifati quyidagi printsiplarga asoslanadi:

1. O‘qituvchiga ishonch – barcha bosqichlardagi o‘qituvchilar magistr darajasiga ega bo‘lib, ularning pedagogik erkinligi to‘liq kafolatlanadi.

Baholashning yengil va shaffofligi – milliy testlar mavjud emas, baholash ko‘proq formatif (rivojlantiruvchi) shaklda amalga oshiriladi.
Shaxsiylashtirilgan ta’lim – har bir talabaning psixologik, intellektual, ijtimoiy ehtiyojlari inobatga olinadi.
Sifat kafolati tizimi – oliy ta’lim muassasalari o‘z ichki sifat monitoring tizimini yuritadi va davlat tomonidan faqat strategik ko‘mak beriladi.
Finlyandiyada o‘quvchilarga ustunlik bermasdan, ularni real hayotga tayyorlashga yo‘naltirilgan ta’lim muhit yaratiladi. Bu esa ta’lim sifati oshishining ichki motivatsiya va kuchli madaniy infratuzilmaga asoslangan modelidir.
Singapur tajribasi: STEM va liderlik asosidagi ta’lim modeli. Singapurda ta’lim sifati davlat siyosatining yadro nuqtasi hisoblanadi. “Teach Less, Learn More” (Kamroq o‘qit, ko‘proq o‘rgat) shiori ostida Singapur o‘zining innovatsion, raqamlashtirilgan va kelajak kasblariga moslashtirilgan ta’lim modelini shakllantirdi. Asosiy jihatlari quyidagilar:
1. STEM fanlariga ustuvorlik – ilm-fan, texnologiya, muhandislik va matematika fanlariga chuqur tayyorgarlik.
2. O‘qituvchilar lideri modeli – har bir o‘qituvchi ham pedagog, ham innovator, ham lider sifatida o‘rganiladi.
3. Baholashning ko‘p bosqichli modeli – formatif, summativ va metakognitiv baholash tizimlari mavjud.
4. Iqtisod bilan integratsiyalashgan ta’lim – oliy ta’lim dasturlari sanoat bilan chambarchas bog‘langan bo‘lib, talaba amaliyot davomida real kasbiy muammolarni hal qiladi. Natijada, Singapur talabalarining PISA (Programme for International Student Assessment) va TIMSS kabi xalqaro testlardagi natijalari yuqori ko‘rsatkichlarga ega.
Yaponiya tajribasi: an’anaviylik va texnologik uyg‘unlik**.** Yaponiya oliy ta’limida sifatni oshirishda “kaizen” (doimiy yaxshilash), “gakko” (maktab jamoasi) va “benkyo” (o‘zlashtirishga sadoqat) kabi qadriyatlar asosiy o‘rin tutadi. Asosiy model xususiyatlari:
1. Qattiq intizom va madaniy yondashuv – talabalar o‘zlashtirishga yuqori darajada mas’uliyat bilan qaraydi.
2. Texnologik integratsiya – robototexnika, AI va IoT bo‘yicha ilg‘or laboratoriyalar, sun’iy intellekt asosida dars modullari mavjud.
3. Ko‘nikmalarga yo‘naltirilgan o‘qitish – har bir ta’lim dasturida o‘rgatilayotgan nazariy bilimlar bilan amaliy ko‘nikmalar uyg‘unlashtirilgan.
Yaponiyada ta’lim sifati o‘qituvchi va talaba o‘rtasidagi ichki madaniyat, mehnatsevarlik, jamoaviylik va halollik tamoyillariga asoslanadi.
Janubiy Koreya tajribasi: milliy yuksalishga yo‘naltirilgan ta’lim siyosati**.** Koreyada ta’lim sifati — bu milliy brend darajasiga ko‘tarilgan. Hukumat tomonidan qabul qilingan “Smart Education 2025” konsepsiyasi asosida raqamli ta’lim, karyera yo‘naltiruvchi dasturlar, startap markazlari va xalqaro sertifikat tizimlari faol joriy qilinmoqda. Mamlakatda:
- Raqamli ta’lim kontenti milliy bazasi mavjud;
- Har bir talaba uchun shaxsiy rivojlanish xaritasi tuziladi;
- Ta’lim sifatini baholashda milliy onlayn platformalardan foydalaniladi (Edunet, Neis, K-MOOC).
Xalqaro tajribalarning umumiy xulosasi shuni ko‘rsatadiki, samarali va barqaror ta’lim sifatiga erishish uchun quyidagi universal model komponentlari zarur:
1. Mustaqil sifat nazorati tizimi – ichki va tashqi baholash mexanizmlarining muvozanatli integratsiyasi;
2. Shaxsga yo‘naltirilgan yondashuv – psixologik, individual va motivatsion ehtiyojlar asosida ta’limni moslashtirish;
3. STEM va raqamli savodxonlik – zamonaviy texnologiyalarni o‘zlashtirishga yo‘naltirilgan o‘quv dasturlari;

4. O‘qituvchi salohiyati va metodik erkinlik – doimiy malaka oshirish, ilmiy-tadqiqot va ijodiy yondashuvni qo‘llab-quvvatlash;
5. Akademik mobillik va xalqaro hamkorlik – global ta’lim maydonida integratsiyani kuchaytirish.

Avvalo, ta’lim sifati zamonaviy yondashuvlarda ko‘p omilli va tizimli kategoriyaga aylangani, u nafaqat bilim berish natijalari, balki ta’lim jarayonining tashkil etilishi, boshqaruv samaradorligi, o‘quv muhiti va ta’lim oluvchining shaxsiy rivojlanish trayektoriyasiga bog‘liqligi bilan belgilanadi, degan qarashlar asoslandi. Sifat tushunchasi faqatgina yakuniy baholash yoki reyting ko‘rsatkichlari orqali emas, balki butun ta’lim tizimining integral holati sifatida talqin qilinishi zarurligi ko‘rsatib o‘tildi, shuningdek, ta’lim sifatiga ta’sir etuvchi ichki va tashqi omillar ham batafsil ko‘rib chiqildi. Ichki omillar qatorida o‘quv dasturlarining zamonaviyligi, o‘qituvchilar malakasi, baholash tizimining adolatliligi, o‘quv muhiti va ta’lim texnologiyalarining holati tahlil qilindi. Tashqi omillar sifatida davlat siyosati, mehnat bozori talablari, xalqaro ta’lim standartlari, jamiyatning ta’limga bo‘lgan munosabati va axborot texnologiyalarining ta’siri alohida ko‘rsatib o‘tildi. Bu yondashuvlar asosida ta’lim sifatiga ta’sir qiluvchi omillar kompleks, o‘zaro bog‘liq va dinamik hodisa ekanligi isbotlandi. Muhim yo‘nalishlaridan biri bu – jahon tajribasida ta’lim sifatini boshqarish va oshirishga oid ilg‘or modellarni o‘rganishdir. AQSh, Finlyandiya, Singapur, Janubiy Koreya va Yaponiya tajribalari tahlili shuni ko‘rsatdiki, sifatni oshirish uchun har bir davlat o‘zining milliy shart-sharoitiga mos, lekin xalqaro talablar bilan uyg‘un yondashuvlarni shakllantirmoqda.

XULOSA

Xususan, o‘qituvchi salohiyati, baholashda mustaqillik, talabaga yo‘naltirilgan metodlar, raqamli infratuzilma va universitet-avtonomiya munosabati sifatlilikni belgilovchi asosiy omillar sifatida tan olinmoqda.

Shu asosda xulosa qilish mumkinki, ta’lim sifatini nazariy jihatdan chuqur tahlil qilish orqali uning zamonaviy talqini, baholash mezonlari va indikatorlari, unga ta’sir qiluvchi ichki va tashqi omillar tizimi, shuningdek xalqaro tajribalarda qo‘llanilayotgan ilg‘or boshqaruv modellari ilmiy asosda ochib berildi. Mazkur asosiy tushunchalar, tahlillar va taqqoslamalar taklif qilinadigan mexanizmlarni asoslash, ularni milliy ta’lim tizimiga moslashtirish va amaliyotga tatbiq etishda nazariy zamin bo‘lib xizmat qiladi.

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Improving Institutional Mechanisms Of International Cooperation In Higher Educational Institutions Of Uzbekistan: Analysis And Strategic Approaches

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Abstract
This study analyzes the institutional mechanisms necessary for the development of international cooperation in higher education institutions in Uzbekistan. Against the background of the reforms being carried out in the country and the need for global integration of higher education, it is emphasized that international cooperation should be approached not only as external relations, but also as a strategic element of university management. The study used a mixed methodology: analysis of national policy documents, comparative analysis with international experience (in particular, the example of Poland, South Korea and Kazakhstan), semi-structured interviews with representatives of 10 higher education institutions, and SWOT analysis. According to the results, there are institutional problems such as the lack of independent international strategies, a shortage of qualified personnel, poor implementation of digital tools, and lack of financial independence. At the same time, some universities are demonstrating positive experiences through programs such as Erasmus+ and DAAD. In conclusion, it is emphasized that strategic planning, human resource development, digitalization, and strengthening financing mechanisms are important for sustainable international cooperation. The results of the study have practical significance for strengthening the higher education system internationally.
Keywords: higher education, international cooperation, institutional mechanism, strategic approach, Uzbekistan
Annotatsiya
Mazkur tadqiqotda O‘zbekiston oliy ta’lim muassasalarida xalqaro hamkorlikni rivojlantirish uchun zarur bo‘lgan institutsional mexanizmlarni tahlil qiladi. Mamlakatda olib borilayotgan islohotlar va oliy ta’limning global integratsiyaga bo‘lgan ehtiyoji fonida, xalqaro hamkorlikka faqat tashqi aloqalar sifatida emas, balki universitet boshqaruvining strategik elementi sifatida yondashish zarurati ta’kidlanadi. Tadqiqotda aralash metodologiyadan foydalanilgan: milliy siyosiy hujjatlar tahlili, xalqaro tajriba (xususan Polsha, Janubiy Koreya va Qozog‘iston misolida) bilan taqqoslama tahlil, 10 ta oliy ta’lim muassasasi vakillari bilan yarimstrukturaviy suhbatlar va SWOT tahlil o‘tkazildi. Natijalarga ko‘ra, mustaqil xalqaro strategiyalarning yo‘qligi, malakali kadrlar tanqisligi, raqamli vositalarning sust joriy etilishi va moliyaviy mustaqillikning yetishmasligi kabi institutsional muammolar mavjud. Shu bilan birga, ayrim universitetlar Erasmus+, DAAD kabi dasturlar orqali ijobiy tajribalarni namoyish etmoqda. Xulosa sifatida, barqaror xalqaro hamkorlik uchun strategik rejalashtirish, inson resurslarini rivojlantirish, raqamlashtirish va moliyalashtirish mexanizmlarini kuchaytirish muhim ekani ta’kidlanadi. Tadqiqot natijalari oliy ta’lim tizimini xalqaro miqyosda kuchaytirishga xizmat qiluvchi amaliy ahamiyatga ega.
Kalit so‘zlar: oliy ta’lim, xalqaro hamkorlik, institutsional mexanizm, strategik yondashuv, O‘zbekiston

Kirish

So‘nggi yillarda O‘zbekistonda oliy ta’lim tizimi tubdan o‘zgarishlarga yuz tutdi. Bu o‘zgarishlar, asosan, ta’lim sifati, boshqaruv samaradorligi va global integratsiyani ta’minlashga qaratilgan

strategik islohotlar bilan belgilanmoqda. Davlat rahbarining oliy ta’limni jadal modernizatsiyalash, uni xalqaro raqobatbardosh darajaga olib chiqish bo‘yicha topshiriqlari asosida qabul qilingan dasturlar va hujjatlar — xususan, 2022–2026 yillarga mo‘ljallangan “Yangi O‘zbekistonning taraqqiyot strategiyasi”, 2023-yil 20-iyundagi PQ–204-sonli Prezident qarori va boshqa normativ hujjatlar — ta’lim tizimining xalqaro ochiqligi va hamkorlikka tayyorligini ko‘zda tutadi. Ayniqsa, O‘zbekistonning 2022-yilda Yevroosiyo oliy ta’lim makoniga (Bologna jarayoniga) to‘liq integratsiyalashuvi bu boradagi muhim bosqichlardan biri bo‘ldi.

Xalqaro hamkorlik oliy ta’lim muassasalari (OTM) uchun nafaqat xorijiy tajriba almashinuvi, qo‘shma dasturlar va ilmiy loyihalarda ishtirokni bildiradi, balki ularning institutsional salohiyatini oshirish, reytinglardagi pozitsiyalarini mustahkamlash va global akademik tarmoqqa faol kirib borish vositasi sifatida ham xizmat qiladi. Shu sababli, bugungi kunda xalqaro hamkorlik masalasi OTMlar faoliyatining chekka yo‘nalishi emas, balki ularning umumiy rivojlanish strategiyasining markaziy komponentiga aylanmoqda.

Biroq bu boradagi sa’y-harakatlar bir xil samaradorlik bilan olib borilmayapti. Aksariyat universitetlar xalqaro hamkorlikni tashabbus darajasida yoki tor doirada olib borayotgan bo‘lsa, ularning faqat bir qismi bu jarayonni tizimli va institutsional asosda boshqarishga muvaffaq bo‘lmoqda. Masalan, 2024-yilgi QS World University Rankings va THE (Times Higher Education) reytinglari natijalariga ko‘ra, O‘zbekistondan bor-yo‘g‘i bir nechta OTM xalqaro mezonlarga javob bera olgan. Bu holat xalqaro aloqalarning sifati va ularni boshqarish mexanizmlarida muvofiqlik yetishmasligini ko‘rsatadi. Bundan tashqari, xalqaro hamkorlikni institutsional darajada rivojlantirish uchun zarur bo‘lgan malakali kadrlar, barqaror moliyaviy asos, elektron boshqaruv tizimlari va strategik rejalashtirishning yetarli darajada shakllanmagani muammolar qatorini tashkil etmoqda.

Shu nuqtai nazardan qaralganda, xalqaro hamkorlikni samarali yo‘lga qo‘yish faqat tashqi aloqalarni ko‘paytirish bilan cheklanmasligi, balki har bir OTM doirasida bu jarayonni boshqarishga xizmat qiluvchi aniq institutsional mexanizmlar mavjud bo‘lishi zarurligini taqozo etadi. Bunday mexanizmlar sifatida xalqaro aloqalar bo‘yicha maxsus bo‘limlarning samarali ishlashi, ularning vakolatlari va moliyaviy mustaqilligi, hamkorlik dasturlarini monitoring qilish tizimi, grantlar bilan ishlash infratuzilmasi va xalqaro akreditatsiya jarayonlarida qatnashishga tayyorlik darajalari nazarda tutiladi.

Shuningdek, xalqaro tajriba ham shuni ko‘rsatadiki, ilg‘or universitetlar (masalan, Janubiy Koreya, Polsha, Singapur, Malayziya, Vengriya OTMlari) o‘z strategiyalarini institut miqyosida ishlab chiqib, xalqaro aloqalarni faqat tashqi ko‘rinish emas, balki sifat va natija yo‘nalishida olib boradilar. Bu yondashuv nafaqat chet ellik talabalarni jalb qilishda, balki ilmiy-innovatsion salohiyatni oshirishda ham ijobiy samara beradi.

Ushbu maqola O‘zbekiston oliy ta’lim muassasalarida xalqaro hamkorlik faoliyatini tahlil qilish, mavjud institutsional mexanizmlarning holatini baholash va ularni takomillashtirish bo‘yicha zamonaviy, strategik yondashuvlarni ilgari surishga qaratilgan. Maqsad — xalqaro hamkorlikni boshqarish sohasida barqaror, tizimli, raqamlashtirilgan va professional yondashuv asoslarini shakllantirish orqali mamlakat oliy ta’lim tizimining global raqobatbardoshligini ta’minlashga xizmat qilishdir.

Adabiyotlar tahlili

So‘nggi yillarda oliy ta’limning globallashuvi bilan bog‘liq jarayonlar xalqaro hamkorlikni nafaqat maqsad, balki oliy ta’lim muassasalari barqarorligi va innovatsion salohiyatining muhim omillaridan biriga aylantirdi. Xalqaro hamkorlikning institutsional mexanizmlari esa, ayni globallashuv fonida, strategik boshqaruv vositasi sifatida faol tadqiq etilmoqda.

Global miqyosda ko‘plab tadqiqotchilar (Knight, 2004[1]; de Wit, 2011[2]; Qiang, 2003[3]) xalqaro hamkorlikni oliy ta’lim muassasalarining strategik rejalashtirish, akademik mobillik, ilmiy-tadqiqot hamkorligi va madaniy almashinuv yo‘nalishlari orqali talqin etadi. Knight (2004)[4] xalqaro hamkorlikni institut darajasida “maqsadli integratsiya va tashqi aloqalarni boshqarish” deb izohlaydi. Unga ko‘ra, xalqaro integratsiya alohida tashabbus emas, balki institutsional strategiyaning ajralmas qismi bo‘lishi kerak.

Bunday qarashlar bugungi O‘zbekiston oliy ta’lim tizimida ham tobora dolzarb bo‘lib bormoqda. O‘zbekiston hukumati tomonidan so‘nggi yillarda xalqaro reytinglarga kirish, xorijiy universitetlar bilan qo‘shma dasturlar yaratish, ikki tomonlama hamkorlik shartnomalarini faollashtirish kabi tashabbuslarning ko‘payishi (O‘zbekiston Respublikasi Prezidentining 2021-yil 6-oktabrdagi PQ–5252-son qarori)[5] xalqaro hamkorlikni strategik bosqichga olib chiqmoqda. Biroq zamonaviy adabiyotlarda qayd etilishicha, faqat tashabbus yetarli emas — muvofiqlashtiruvchi institutsional mexanizmlar samarali ishlamasa, xalqaro aloqalar faqat rasmiylik darajasida qolib ketishi mumkin. Sursock (2015)[6] ta’kidlaganidek, xalqaro hamkorlikni muvaffaqiyatli yuritish uchun har bir OTMda aniq vakolatlarga ega bo‘lgan xalqaro bo‘limlar, ma’lumot almashinuv tizimlari, monitoring indikatorlari va moliyaviy-moddiy resurslar mavjud bo‘lishi kerak.

Boshqa tomondan, Markaziy Osiyodagi shunga o‘xshash tajribalarda, masalan Qozog‘iston va Qirg‘izistonda, xalqaro hamkorlik bo‘yicha institutlararo konsortsiumlar shakllanmoqda (Abdrakhmanova, 2022)[7]. Bunday tarmoq yondashuvi ham O‘zbekiston uchun dolzarb bo‘lishi mumkin.

Zamonaviy ilmiy adabiyotlarda raqamli texnologiyalar ham xalqaro hamkorlikning institutsional mexanizmlariga yangi imkoniyatlar yaratishi ta’kidlanadi. Marginson (2019)[8] fikricha, transmilliy ta’lim shakllari, masofaviy qo‘shma dasturlar va virtual almashinuv modellarining rivojlanishi ko‘plab rivojlanayotgan davlatlar uchun o‘ziga xos “strategik imkoniyat derazasi” bo‘lib xizmat qilmoqda. Shu jihatdan, O‘zbekistonda raqamli infratuzilmani xalqaro hamkorlikka integratsiya qilish masalasi ham nazariy va amaliy tahlilni talab qiladi.

Ayni paytda, milliy miqyosda nashr etilgan tadqiqotlar orasida xalqaro hamkorlik institutsional tizimini mukammal yoritgan ishlar soni hanuz cheklangan. Aksariyat ishlar, odatda, umumiy statistik ko‘rsatkichlar yoki normativ hujjatlar sharhi bilan chegaralanadi. Bu esa chuqur strategik tahlilga ehtiyoj mavjudligini ko‘rsatadi.

Shunday qilib, xalqaro va milliy ilmiy manbalar tahlili shuni ko‘rsatadiki, xalqaro hamkorlikni rivojlantirishda faqat tashabbuslar emas, balki ular ortida ishlaydigan samarali, moslashuvchan va monitoringga asoslangan institutsional mexanizmlar muhim rol o‘ynaydi. Ushbu maqola aynan shu jihatlarni O‘zbekiston kontekstida chuqur tahlil qilishni maqsad qilgan.

Metodologiya

Mazkur tadqiqotda O‘zbekiston oliy ta’lim muassasalarida xalqaro hamkorlikni rivojlantirishga doir mavjud institutsional mexanizmlarni o‘rganish va baholash uchun bir nechta zamonaviy va kompleks metodlardan foydalanildi. Yondashuvlar tanlanishida ularning mavzuga mosligi,

[1] Knight, J. (2004). *Internationalization remodeled: Definition, approaches, and rationales*. Journal of Studies in International Education, **8**(1), 5–31. https://doi.org/10.1177/1028315303260832

[2] de Wit, H. (2011). *Globalization and internationalization of higher education*. Revista de Universidad y Sociedad del Conocimiento (RUSC), **8**(2), 241–248. https://doi.org/10.7238/rusc.v8i2.980

[3] Qiang, Z. (2003). *Internationalization of higher education: Towards a conceptual framework*. Policy Futures in Education, **1**(2), 248–270. https://doi.org/10.2304/pfie.2003.1.2.5

[4] Knight, J. (2004). *Internationalization remodeled: Definition, approaches, and rationales*. Journal of Studies in International Education, **8**(1), 5–31. https://doi.org/10.1177/1028315303260832

5 O‘zbekiston Respublikasi Prezidenti. (2021). *Oliy ta’lim tizimini tubdan isloh qilish chora-tadbirlari to‘g‘risida* (PQ–5252-son qaror). https://lex.uz/docs/5663455

[6] Sursock, A. (2015). *Trends 2015: Learning and teaching in European universities*. European University Association. https://eua.eu

[7] Abdrakhmanova, G. (2022). *Institutional cooperation in higher education in Central Asia: A case of Kazakhstan and Kyrgyzstan*. Central Asian Journal of Education, **3**(1), 33–45.

[8] Marginson, S. (2019). *Limitations of human capital theory*. Studies in Higher Education, **44**(2), 287–301. https://doi.org/10.1080/03075079.2017.1359823

holatni chuqur tahlil qilishga imkon beruvchi xususiyatlari va ilmiy asoslanganligi inobatga olindi.

Avvalo, tahliliy yondashuv asosida O‘zbekiston Respublikasi oliy ta’lim tizimiga oid asosiy huquqiy-me’yoriy hujjatlar chuqur o‘rganildi. Bunga Prezident farmonlari, Vazirlar Mahkamasi qarorlari, tegishli vazirlik va idoralar — xususan, Oliy ta’lim, fan va innovatsiyalar vazirligining strategik konsepsiyalari, dasturnomalar va sohaviy tahliliy hisobotlari kiritildi. Ushbu yondashuv, ayniqsa, xalqaro hamkorlikni rasmiy asosda tartibga soluvchi siyosiy-ijtimoiy kontekstni aniqlashda muhim ahamiyat kasb etdi.

Ikkinchidan, taqqoslama tahlil metodi orqali O‘zbekiston tajribasi MDH davlatlari (Rossiya, Qozog‘iston, Ozarbayjon) hamda ayrim Yevropa mamlakatlari (Polsha, Vengriya, Litva)ning oliy ta’lim muassasalaridagi xalqaro hamkorlikni boshqarish modellari bilan solishtirildi. Bu tahlil turli mamlakatlardagi institutsional mexanizmlar, ularning huquqiy bazasi, tashkiliy tuzilmalari va natijaviylik ko‘rsatkichlarini o‘zaro qiyoslash orqali o‘ziga xoslik va umumiyliklarni aniqlashga xizmat qildi.

Shuningdek, amaliy jihatdan muhim bo‘lgan sifatli so‘rovnoma usuli ham tadqiqotda qo‘llandi. Jumladan, intervyular quyidagi oliy ta’lim muassasalarida faoliyat yurituvchi xalqaro bo‘lim vakillari bilan o‘tkazildi: O‘zbekiston Milliy universiteti, Toshkent Axborot texnologiyalari universiteti (TATU), Toshkent davlat iqtisodiyot universiteti, Buxoro davlat universiteti, Farg‘ona davlat universiteti, Andijon davlat universiteti, Namangan davlat universiteti, Samarqand davlat chet tillar instituti, Urganch davlat universiteti va Qarshi davlat universiteti. Tanlov OTMlarning hududiy va reytingdagi xilma-xilligini hisobga olgan holda amalga oshirildi. Ushbu suhbatlar xalqaro hamkorlikni amaliyotda qanday boshqarilayotgani, mavjud muammolar, tashkiliy muvofiqlik darajasi, byurokratik to‘siqlar va tashqi sheriklar bilan aloqalarda yuzaga keladigan cheklovlar haqida chuqur tasavvur olishga yordam berdi. Intervyular maxfiylik tamoyiliga rioya qilgan holda, yozma va og‘zaki shaklda olib borildi, so‘ngra kodlash va mavzulashtirish asosida tahlil qilindi.

Nihoyat, tadqiqot doirasida SWOT tahlil vositasida O‘zbekiston OTMlarida xalqaro hamkorlikni rivojlantirishga oid mavjud institutsional mexanizmlarning kuchli va zaif tomonlari, ularning imkoniyatlari hamda mavjud xavf-xatarlar tizimli ravishda tahlil qilindi. Bu tahlil strategik rejalashtirish uchun muhim ma’lumot manbai sifatida xizmat qildi, chunki u mavjud holatni aniq tasvirlab, rivojlanish vektorlarini belgilash imkonini berdi.

Ushbu metodlar uyg‘unligi tadqiqotga ko‘p qirrali yondashuv imkonini berdi, shuningdek, xalqaro hamkorlik masalasining O‘zbekistondagi real sharoitda qanday shakllanayotganini nafaqat hujjatlar, balki amaliy dalillar asosida tahlil qilish imkoniyatini yaratdi.

Natijalar

O‘zbekiston oliy ta’lim muassasalarida xalqaro hamkorlikni rivojlantirish borasida bir qator ijobiy tashabbuslar ko‘zga tashlanmoqda. Jumladan, turli xalqaro dasturlarda ishtirok etish, xorijiy oliygohlar bilan hamkorlik memorandumi tuzish, qo‘shma ta’lim yo‘nalishlarini yo‘lga qo‘yish bo‘yicha aniq qadamlar tashlangan. Biroq tadqiqot doirasida o‘tkazilgan hujjatlar tahlili, so‘rovnomalar va taqqoslama tahlillar shuni ko‘rsatdiki, mavjud jarayonlar institutsional jihatdan muayyan muammolar va tizimli kamchiliklarga duch kelmoqda.

Quyidagi jadval ushbu muammolarni tizimli shaklda aks ettiradi:

Asosiy muammo	**Tavsif**
Raqobatbardosh strategiyaning yo‘qligi	Ko‘plab OTMlarda xalqaro aloqalarni rivojlantirish bo‘yicha mustaqil strategiya mavjud emas yoki faqat umumiy konsepsiya darajasida qolmoqda.
Malakali kadrlar yetishmasligi	Xalqaro bo‘limlarda xorijiy tillarni mukammal biladigan, xalqaro grantlarni boshqarish tajribasiga ega xodimlar yetarli emas.
Axborot texnologiyalarining sustligi	Hamkorlik imkoniyatlarini boshqarish, shartnomalarni raqamlashtirish yoki arizalarni avtomatlashtirish tizimi deyarli mavjud emas.

Moliyalashtirish cheklovlari	Xorijiy mehmonlarni qabul qilish, xalqaro forumlarda qatnashish yoki grant loyihalarini yuritish uchun zarur mablag‘lar ajratilmagan yoki yetarli emas.

Bunday muammolar, avvalo, xalqaro hamkorlikni institutsional darajada izchil boshqarish mexanizmlari yetishmasligi bilan bog‘liq. So‘rovnoma ishtirokchilarining aksariyati — 10 ta OTM xalqaro bo‘lim vakillari — ham ushbu muammolarni amaliy faoliyatda tez-tez uchraydigan holat sifatida qayd etdilar. Ayniqsa, malakali mutaxassislar tanqisligi va tizimlashtirilgan axborot infratuzilmasining yo‘qligi eng katta to‘siqlardan biri sifatida ko‘rsatildi.

Shu bilan birga, ayrim universitetlar ilg‘or tajribalarga ega ekani kuzatildi. Masalan:

O‘zbekiston Milliy universiteti va TATUda Erasmus+ dasturi doirasidagi akademik almashinuv samarali yo‘lga qo‘yilgan;

Buxoro davlat universitetida DAAD (Germaniya akademik almashinuv xizmati) bilan qo‘shma ilmiy-tadqiqot loyihalari boshlangan;

- Ba’zi OTMlarda “International Office” lar markazlashtirilgan va mustaqil boshqaruvga ega.

Bu tajribalar xalqaro hamkorlikni faqat tashqi aloqalar sifatida emas, balki institutsional rivojlanishning strategik elementi sifatida ko‘rishga asos bo‘la oladi. Ular asosida kompleks yondashuv ishlab chiqilishi mumkin.

Umuman olganda, natijalar shuni anglatadiki, xalqaro hamkorlikni rivojlantirish uchun tashabbus va motivatsiya mavjud, biroq bu jarayonni barqarorlashtirish uchun aniq strategiyalar, inson resurslari va zamonaviy boshqaruv texnologiyalari talab etiladi. Ana shunday mexanizmlarning shakllanishi esa mamlakat oliy ta’lim tizimining xalqaro maydondagi raqobatbardoshligini belgilab beradi.

Tahlil va muhokama

Yuqorida bayon etilgan natijalar shuni ko‘rsatadiki, O‘zbekiston oliy ta’lim muassasalarida xalqaro hamkorlik sohasidagi sa’y-harakatlar faollashganiga qaramay, ularning institutsional asoslari hali to‘liq shakllanmagan. Ko‘pgina OTMlar ushbu yo‘nalishni faqat tashqi aloqalar sifatida qabul qilmoqda; holbuki, xalqaro hamkorlik zamonaviy universitet boshqaruvining ajralmas va strategik qismiga aylanishi zarur. Bunday yondashuv muassasaning raqobatbardoshligini oshirishda, akademik sifatni yuksaltirishda va xalqaro reytinglarda yuqori o‘rin egallashda muhim rol o‘ynaydi.

Birinchidan, har bir oliy ta’lim muassasasi o‘zining xalqaro rivojlanish strategiyasini ishlab chiqishi lozim. Bu strategiya umumiy niyat bayonotidan farqli ravishda, aniq maqsadlar, o‘lchab bo‘ladigan natijalar va monitoring indikatorlarini o‘z ichiga olgan bo‘lishi kerak. Jumladan, xalqaro nufuzli reytinglarda ishtirok etish, qo‘shma ilmiy-tadqiqot loyihalar soni, akademik mobillik hajmi kabi mezonlar doirasida baholash mexanizmlari joriy etilishi zarur.

Ikkinchidan, xalqaro hamkorlik sohasida ishlovchi kadrlarning salohiyatini oshirish — strategik ustuvorliklardan biri sifatida ko‘rilishi kerak. Amaliy tadqiqotlar va intervyular shuni ko‘rsatmoqdaki, ko‘plab xalqaro aloqalar bo‘limlari zamonaviy grant yozish ko‘nikmalariga ega emas, akademik ingliz tilida erkin fikr bildirishda qiyinchiliklar mavjud. Shu boisdan, muntazam ravishda treninglar, seminarlar va onlayn kurslar tashkil qilish, xorijiy tajriba almashinuvlarini yo‘lga qo‘yish zaruratga aylangan.

Uchinchidan, xalqaro aloqalarni boshqarishda axborot texnologiyalari imkoniyatlaridan foydalanish, nafaqat jarayonni soddalashtiradi, balki samaradorlikni oshiradi. Bugungi kunda ko‘plab yetakchi universitetlarda xalqaro hamkorlik portallari, elektron ariza tizimlari, shartnoma monitoring platformalari mavjud. O‘zbekiston OTMlarida bunday tizimlar yo‘qligi ko‘plab imkoniyatlarning boy berilishiga olib kelmoqda. Aksariyat OTMlarda xalqaro aloqalarni yuritish bo‘yicha zamonaviy axborot tizimlari mavjud emas. Masalan, intervyu ishtirokchilarining 70 foizi xalqaro hamkorlikka oid ma’lumotlar (shartnomalar, arizalar, grant loyihalari) Excel fayllarda yoki qog‘oz hujjatlar orqali yuritilishini bildirgan. Faqat ayrim universitetlarda, masalan, Toshkent Axborot texnologiyalari universitetida “International Projects Management” bo‘yicha ichki onlayn portal mavjud bo‘lib, grant loyihalar va akademik almashinuv holatini

raqamli kuzatish imkonini beradi. Shu kabi tizimlarning keng joriy etilishi samaradorlikni sezilarli oshiradi.

To‘rtinchidan, moliyaviy mustaqillik va grant asosida faoliyat yuritish — xalqaro loyihalarni barqarorlashtirishda muhim omil hisoblanadi. OTMlar o‘zining xalqaro sherikliklari orqali qo‘shimcha moliyaviy resurslarga ega bo‘lishi, ilmiy infratuzilmani mustahkamlashi va professor-o‘qituvchilarga qo‘llab-quvvatlov mexanizmlarini yaratishi mumkin. Bu, o‘z navbatida, universitetning innovatsion salohiyatini oshiradi.

Xalqaro tajriba ham bunday yondashuvlarni tasdiqlaydi. Masalan, Polsha va Vengriya universitetlari Yevropa Ittifoqining Erasmus+ dasturlari doirasida ko‘plab qo‘shma dasturlarni amalga oshirib, global ilmiy maydondagi ishtirokini kuchaytirgan. Janubiy Koreyada esa universitetlarning xalqaro strategiyasi milliy darajadagi ustuvorlik sifatida qaralib, davlat tomonidan qo‘llab-quvvatlanadi. Ushbu tajribalar O‘zbekiston OTMlari uchun ham foydali yo‘l xaritasini taklif etadi.

Xulosa qilib aytganda, xalqaro hamkorlikni muvaffaqiyatli rivojlantirish uchun OTMlar uni tashqi faoliyat emas, balki institut sifatida shakllantirishi kerak. Strategik rejalashtirish, kadrlar tayyorlash, raqamli boshqaruv va grant asosida moliyalashtirish — bu yo‘nalishdagi asosiy ustunlardir. Bunday kompleks yondashuv O‘zbekiston oliy ta’lim tizimini global ta’lim makoniga integratsiyalashuviga xizmat qiladi.

Xulosa

O‘zbekiston oliy ta’lim muassasalarida xalqaro hamkorlik sohasini rivojlantirish bugungi globallashuv sharoitida strategik ustuvor yo‘nalishlardan biriga aylangan. Biroq, mavjud tahlillar shuni ko‘rsatadiki, ushbu yo‘nalishda olib borilayotgan tashabbuslar asosan tashqi aloqalar shaklida ko‘rilmoqda, ularni tizimli va barqaror rivojlantirish uchun zarur bo‘lgan institutsional asoslar hali yetarlicha shakllanmagan. Xalqaro hamkorlikni muvaffaqiyatli yo‘lga qo‘yish uchun bu faoliyatni faqat amaliy tashriflar yoki qo‘shma dasturlar bilan cheklamasdan, balki butun universitet boshqaruvi va rivojlanish strategiyasining ajralmas qismiga aylantirish zarur.

Dunyo tajribasi shuni ko‘rsatmoqdaki, xalqaro reytinglarda muvaffaqiyatli bo‘layotgan oliy ta’lim muassasalari aynan kuchli institutsional boshqaruv, ilg‘or axborot texnologiyalari va moliyaviy mustaqillikka asoslangan yondashuv tufayli oldinga siljimoqda. O‘zbekiston sharoitida ham bu yo‘nalishda samarali natijalarga erishish uchun quyidagi omillar muhim ahamiyatga ega: har bir OTM darajasida xalqaro strategiya ishlab chiqilishi; malakali kadrlar bilan ta’minlash; raqamli boshqaruv tizimlarini joriy etish; grant va xalqaro moliyaviy dasturlardan foydalanish imkoniyatlarini kengaytirish.

Shuningdek, xalqaro tajribalarni mexanik tarzda ko‘chirib olish emas, balki ularni milliy kontekstga moslashtirish orqali o‘ziga xos yondashuvlar ishlab chiqish zarur. Chunki har bir mamlakatning oliy ta’lim tizimi o‘ziga xos siyosiy, iqtisodiy va madaniy omillar bilan chambarchas bog‘liq. Shu boisdan, xalqaro hamkorlikni rivojlantirishda mahalliy imkoniyatlar va cheklovlar hisobga olingan holda, barqaror, moslashuvchan va natijaga yo‘naltirilgan strategiyalar asosida harakat qilish lozim.

Xulosa qilib aytganda, O‘zbekiston oliy ta’lim muassasalarida xalqaro hamkorlikni chuqur va izchil tarzda rivojlantirish uchun, bu yo‘nalish faqat tashqi faoliyat emas, balki akademik va boshqaruviy siyosatning markaziy elementi sifatida qaralishi kerak. Ana shundagina universitetlarning ilmiy salohiyati, xalqaro nufuzi va butun respublika oliy ta’lim tizimining global integratsiyalashuvi ta'minlanadi.

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Results Of Experiments On Selecting The Type Of Combined Aggregate Cutter

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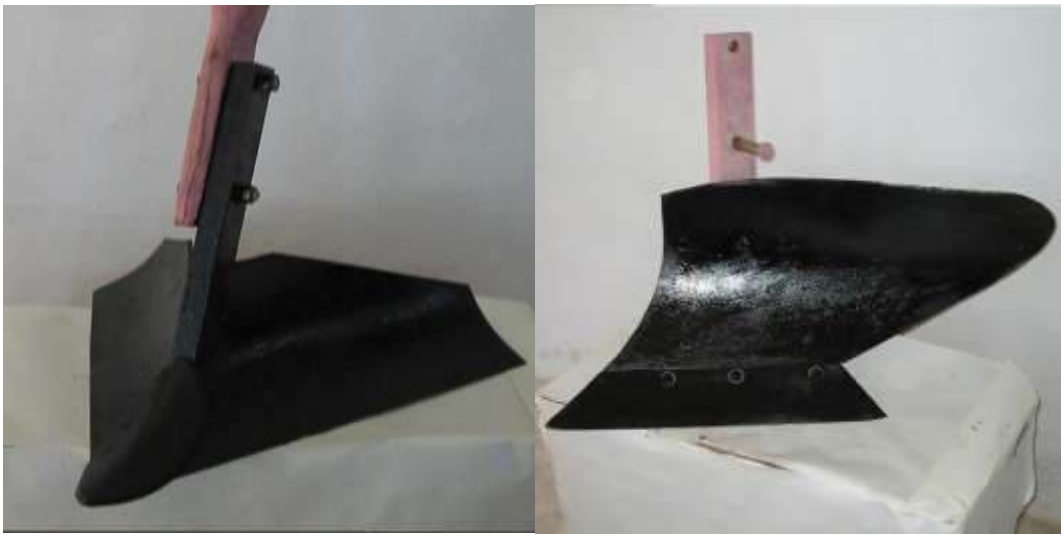
Abstract
The article presents the results of studies on selecting the type of combined aggregate chopper designed for minimal soil cultivation.
Keywords: Spherical disk, upper body of the plow, working body of the chopper, dynamometric device, strain gauge, calibration, chopper height, total depth of the loosened layer, resistance of the working body to traction, quality of soil crushing.

Аннотатция
Мақолада тупроққа минимал ишлов беришга мўлжалланган комбинациялашган агрегат пушта олгичининг турини танлаш бўйича ўтказилган тадқиқотларнинг натижалари келтирилган.
Калит сўзлар: Сферик диск, плугнинг юқориги корпуси, пушта олгичнинг иш органи, динамометрик қурилма, тензобалка, тарировка, пуштанинг баландлиги, юмшатилган қатламнинг умумий чуқурлиги, иш органининг тортишга қаршилиги, тупроқнинг уваланиш сифати.

Ҳозирги пайтда далаларни чигит экишга тайёрлаш ишлари кеч куз ва эрта баҳорда алоҳида-алоҳида агрегатлар билан бажариладиган ерларни ўғитлаш, шудгорлаш, шудгорлашда ҳосил бўладиган нотекисликликларни текислаш, чизеллаш, бороналаш, молалаш ва пушта олиш каби агротехника тадбирларидан ташкил топган бўлиб, булардан чиззеллаш, бороналаш ва молалаш тадбирлари икки-уч мартадан бажарилади.Тупроққа даладан бундай кўп марталаб ўтиб ишлов бериш меҳнат , энергия ва ёқилғи сарфини ошиши, унинг структураси бузилиши ва ортиқча зичланишига олиб келади. Яна шуни таъкидлаш лозимки сўнги йилларда бутун жаҳонда ерларга тупроқни ағдармасдан ва минимал, яъни иложи борича кам ишлов беришга ўтиляпти ҳамда агрегатни даладан бир ўтишида тупроқни экишга тайёрлаш бўйича бир нечта ёки барча технологик жараёнларни қўшиб бажариш кенг тарқалмоқда. Ушбу айтганлардан келиб чиққан ҳолда Қишлоқ хўжалигини механизациялаш илмий-тадқиқот институтида, Андижон машинасозлик институти ҳамда Ўзбекистон пахтачилик илмий – тадқиқот институтининг Андижон филиали билан ҳамкорликда далаларни чигит экишга тайёрлашда тупроққа минимал ишлов берилишини таъминлайдиган янги технологияни амалга ошириш учун юмшатгич,ўғитлагич ва пушта олгичлардан ташкил топган комбинациялашган агрегат ишлаб чиқилган [1,2]. Бу технология ва комбинациялашган агрегат қўлланилганда кузда даладан бир ўтишда тупроқ йўл-йўл юмшатилади,ўғитланади ва пушта олиб кетилади. Эрта баҳорда пушталарга ишлов берилиб, устига чигит экилади.Ўтказилган дастлабки синовлар ва тажрибаларни кўрсатишича таклиф этилаётган технология ва уни амалга оширадиган комбинациялашган агрегатни қўллаш ерларни чигит экишга тайёрлашда меҳнат ва ёқилғи-мойлаш материалллари сарфини 46-54 фоизга камайтириш ва пахта ҳосилини гектарига 4-5 центнер ошириш имконини беради.

Мазкур мақолада комбинациялашган агрегат пушта олгичининг турини танлаш бўйича ўтказилган тадқиқотларнинг натижалари келтирилган. Комбинациялашган агрегат пушта олгичининг мақбул турини танлаш учун ГХ-4 пушта олгич иш органи, ПД-4-45 икки ярусли плуг юқориги корпуси ҳамда ТДБ-3/5 дискли борона сферик дискларининг (1-расм) ўзаро таққослов синовлари ўтказилди.



а б

в

а-ГХ-4 пушта олгичнинг иш органи;
б-ПД-4-45 икки ярусли плугнинг юқори корпуси
в-ТДБ-3/5 дискали боронанинг сферик диски
1-расм. Пушта олгичнинг турли вариантлари

Синовларда пушта олгичнинг турли вариантлари қуйидаги кўрсатгичлар бўйича таққосланди:

- пуштанинг баландлиги;
- юмшатилган қатламнинг умумий чуқурлиги;
- тупроқнинг уваланиш сифати;
- иш органининг тортишга қаршилиги.

Бу кўрсатгичлар Tst 63.02.2001 “Испытания сельскохозяйственной техники. Машины и орудия для глубокой обработки почвы. Программа и методы испытаний”, Tst 63.04.2001, “Испытания сельскохозяйственной техники. Машины и орудия для поверхностной обработки почвы. Программа и методы испытаний”, Tst 63.03.2001 “Испытания сельскохозяйственной техники. Методы энергетической оценки машин” бўйича аниқланди.

Пушта баландлиги унинг учидан эгат тубигача бўлган Н масофани 0,1 см аниқликда ўлчаш йўли билан пушта олингандан кейин ҳосил бўлган юмшатилган қатламнинг умумий қалинлиги эса кўндаланг кесим юзи 1 $см^2$ ва ўлчов оралари 0,5 см этиб белгиланган чизғични ҳосил бўлган пушта марказидан қаттиқ қатламгача, яъни юмшатилган эгат тубигача ботирилиб аниқланди.

Тупроқни уваланиш сифати 0,5х0,5х0,2м тубсиз қути ёрдамида пуштадан олинган тупроқ намуналарини ўлчамлари 100 мм дан катта, 100-50 мм ва 50 мм дан кичик фракцияларга ажратиш йўли билан аниқланди. Бунинг учун олинган намуналар тешикларининг диаметри 50 ва 100 мм бўлган элаклардан ўтказилди. Олинган натижалар тупроқнинг умумий массасига нисбатан фоизда ҳисобланиб, тупроқни уваланиш сифати аниқланди [3].

Тажрибаларда олинган маълумотлар бўйича математик статистика усуллари қўлланилиб қўрсатгичларнинг ўртача арифметик қийматлари ва ўртача квадратик четланишлари топилди.Синовларда олинган натижалар жадвалда келтирилган. Бу маълумотлардан кўриниб турибдики, пушта олгич сифатида ТДБ-3/5 дискали боронанинг диски қўланилганда иш органинг тортишга қаршилиги кам бўлган ҳолда олинган пуштанинг баландлиги эса катта ҳамда тупроқнинг уваланиш сифати яхши бўлиши таъминлаган. Бундан ташқари айланиб ишлаганлиги сабабли унинг ўсимлик қолдиқлари ва бегона ўтларга тиқилиши кузатилмади.

ПД-4-45 плуги юқориги ярусининг корпуслари қўлланилганда сезиларли даражада пушта ҳосил бўлмади. Бунинг асосий сабаби шуки комбинациялашган агрегат таркибида пушта олишда қўлланилганда улар ёпиқ кесиш шароитида ишлашади. Шу сабабли улар палахсаларни етарли даражада юқори кўтара олмайди.

Ушбу таъкидлаганлардан келиб чиққан ҳолда комбинациялашган агрегатнинг пушта олувчи иш органи сифатида сферик дискни қабул қиламиз ва кейинги тадқиқотларда унинг параметрлари асослаш назарда тутилган [4].

Пушта олгичларнинг сифат ва энергетик кўрсаткичлари

Пушта олгичнинг тури	Агрегат-нинг ҳаракат тезлиги км/соат	Қуйидаги ўлчамлиги (мм) фракциялар миқдори, %			Пушта баландлиги, см		Юмшатилган қатламнинг умумий баландлиги, см		Иш органинг тортишга қаршили-ги, кН
		>100	100-50	< 50	Мўр	± σ	Мўр	± σ	
1.ГХ-4 пушта олгич иш органи	6,0	11,13	14,43	74,44	25,5	1,29	70,8	1,48	3,31
	8,0	9,77	10,73	79,50	27,8	0,98	73,9	1,05	4,05
2.ПД-4-45 плугининг юқориги корпуси	6,0	13,97	11,30	74,73	17,8	1,85	57,5	1,63	4,31
	8,0	10,97	13,16	75,87	15,9	2,08	60,8	1,92	4,89
3.ТДБ-3/5 дискали боронанинг диски	6,0	9,20	12,17	78,63	30,3	1,28	73,5	1,42	2,37
	8,0	8,53	18,80	79,67	28,9	1,92	74,9	1,08	2,55

Хулосалар

1. Таққослов синовларининг натижалари бўйича комбинациялашган агрегатда пушта олгич сифатида сферик дискларни қўллаш кам энергия сарфлаган ҳолда тупроқни сифатли уваланиши ва баландлиги катта пушта олинишини таъминлайди.

2. Кейинги тадқиқотлар сферик диск параметрларини пушта ўлчамлари ва уни олишга сарфланаётган энергия миқдорига таъсирини ўрганишга ва шу асосда сферик диск параметрларини асослашга йўналтирилиши лозим.

Фойдаланилган адабиётлар:

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Investigation Of The Process Of Processing Double Salt Into Potassium Sulfate

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Abstract
This comprehensive study investigates the conversion process of double salt $K_2SO_4 \cdot (NH_4)_2SO_4$ into high-purity potassium sulfate through controlled dissolution and selective precipitation mechanisms. The research focuses on optimizing the conversion parameters to achieve maximum potassium sulfate yield while minimizing impurity incorporation and byproduct formation. Experimental investigations were conducted using double salt obtained from the interaction of flotation potassium chloride with ammonium sulfate solutions under precisely controlled conditions.
Keywords: Double salt conversion; Potassium sulfate; Dissolution kinetics; Selective precipitation; Liquid-solid equilibrium.

INTRODUCTION

The conversion of double salt $K_2SO_4 \cdot (NH_4)_2SO_4$ into pure potassium sulfate represents a critical step in the overall production chain of this valuable agricultural chemical [1]. This process requires careful optimization to achieve high conversion efficiency while maintaining product quality and minimizing environmental impact [2]. The double salt conversion method offers several advantages over direct production routes, including better control over product purity and the ability to recycle process streams [3]. The theoretical foundation for double salt conversion is based on the principle of selective dissolution and precipitation, where the double salt is dissolved in water and then treated with additional potassium chloride to shift the equilibrium toward potassium sulfate formation [4]. This process involves complex solution chemistry and phase equilibria that must be carefully controlled to achieve optimal results [5]. Understanding these mechanisms is essential for developing efficient industrial processes that can compete with alternative production methods [6]. The quality requirements for potassium sulfate used in agricultural applications are stringent, particularly regarding impurity levels and chemical composition [7]. The conversion process must be designed to minimize the incorporation of unwanted components such as ammonium ions and chlorides, which can adversely affect crop performance [8]. Furthermore, the process must be economically viable and environmentally sustainable to be attractive for commercial implementation [9].

RESEARCH METHODOLOGY

The experimental investigation was designed to provide comprehensive evaluation of the double salt conversion process under carefully controlled laboratory conditions. The methodology encompasses detailed characterization of starting materials, systematic process optimization, and thorough analysis of products and byproducts.The double salt $K_2SO_4 \cdot (NH_4)_2SO_4$ used in this study was prepared through the optimized conversion method described in previous research. The material was subjected to comprehensive characterization including X-ray diffraction analysis to confirm crystal structure, scanning electron microscopy to evaluate particle morphology, and quantitative chemical analysis to determine composition. The double salt exhibited consistent quality with K_2O content of 50.96-51.20% and SO_4^{2-} content of 49.60-49.65%, with minimal impurity levels.

RESULTS AND DISCUSSION

To obtain potassium sulfate, the double salt was dissolved in water and a 10% solution of flotation potassium chloride was added to the double salt solution, taken in an amount that ensured L:S in the initial suspension (0.7-2):1, and kept at a temperature of 25 °C for 1 hour.

The suspension was separated on a filter and the sediment was washed with water. The results of the studies are given in Tables 1 and 2.

Table 1. Effect of S:L on the chemical composition of potassium sulfate during conversion of double salt

S:L	Chemical composition, mass %			
	K_2O	NH_4^+	Cl^-	SO_4^{2-}
1:0.7	50.51	1.82	1.0	55.08
1:1	51.03	1.61	0.68	55.50
1:2	51.06	1.58	0.583	55.57

As can be seen from Table 2, the compositions of potassium sulfate obtained at L:S 1:1 and 2:1 have almost the same composition. This suggests that increasing L:S more than 1:1 has virtually no effect on the composition of the resulting potassium sulfate. The resulting product after drying has the following composition (wt.%): K_2O – 51.03; SO_4^{2-} – 55.50; NH_4+ – 1.61; Cl^- – 0.68.

Conclusion. This comprehensive investigation successfully demonstrated the feasibility of converting double salt $K_2SO_4 \cdot (NH_4)_2SO_4$ into high-quality potassium sulfate through optimized dissolution and precipitation processes. The experimental results establish optimal liquid-to-solid ratios of 1:1.0 to 1:2.0, with reaction conditions of 25°C and 60-minute duration.

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Determination Of Iron Content In The “FER-RICH” Solution By Inductively Coupled Plasma Optical Emission Spectrometry

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Abstract
Inductively coupled plasma optical emission spectrometry (IBP-OES) is a highly sensitive physical-analytical method used for quantitative and qualitative analysis of elements. This technology is mainly used to determine metal and some non-metallic elements in substances.
Keywords: FER-RICH, detector, atomization, ionization, optical emission, generator, spectral lines, spectrometer.
Annotatsiya
Induktiv bog'langan plazmali optik emissiya spektrometriya (IBP-OES) — elementlarning miqdoriy va sifat tahlili uchun ishlatiladigan yuqori sezgirlikka ega fizik-analitik usuldir. Bu texnologiya asosan moddalardagi metall va ayrim g’ayrimetall elementlarni aniqlash uchun ishlatiladi.
Kalit so’zlar: FER-RICH, detektor, atomizatsiya, ionizatsiya, optik emissiya, generator, spektral chiziqlar, spektrometr.

Dolzarbligi. Induktiv bog'langan plazmali optik emissiya spektrometriya (IBP-OES) — kimyoviy tahlil usuli bo'lib, bu usul elementlarning tarkibini aniqlashda yuqori aniqlik va sezgirlikka ega. IBP-OES texnikasi elementlarning atomlarini yuqori haroratli plazmada eksitatsiya qilish orqali ularning chiqaradigan yorug'lik spektrini tahlil qiladi. Bu usul tibbiyot, atrof-muhit monitoringi, oziq-ovqat va ichimliklar nazorati kabi ko'plab sohalarda qo'llaniladi.
Tadqiqotning maqsadi. FER-RICH eritmasi tarkibidagi temir miqdorini induktiktiv bog’langan plazmali optik emission spektrometriya usulida aniqlash. IBP-OES texnikasi elementlarning atomlarini yqori haroratli plazmada eksitatsiya qilish orqali ularning chiqaradigan yorug’lik spektrini tahlil qiladi.
IBP-OES usulining asosiy tamoyillari. 1. Plazma hosil qilish: IBP-OES texnikasida yuqori haroratli plazma (8000-10000 K) hosil qilish uchun induktiv bog'langan plazma ishlatiladi. Plazma odatda argon gazidan hosil qilinadi.
2. Namuna kiritish: - Tahlil qilinadigan namuna eritma shaklida atomizator yordamida plazmaga kiritiladi. Atomizator namunaning suyuqligini mayda tomchilarga ajratib, plazmaga yetkazadi.
3. Atomizatsiya va ionizatsiya: - Plazmada yuqori harorat ta'sirida namunadagi atomlar eksitatsiya holatiga o'tadi va keyinchalik bu atomlar yorug'lik (fotolar) chiqaradi.
4. Optik emissiya va detektsiya: - Eksitatsiya holatidagi atomlar asosiy holatga qaytganda chiqaradigan yorug'lik plazma orqali spektral dispersiv sistema (monoxromator yoki polixromator) yordamida ajratiladi. Detektorda spektral chiziqlar intensiteti o'lchanadi.
Tadqiqotning obyekti va tekshirish usullari. Tadqiqot ob’ekti sifatida temir birikmasi asosida “FER-RICH” eritmasi olindi.
Usul nomi: induktiv bog'langan plazmali optik emission spektrometr. IBP-OES
RF quvvati: 1000 Vt
Nasos tezligi: 50 aylanish/min
Yordamchi oqim: 0,5 l/min
Spray oqimi: 0,65 l/min
Sovutish oqimi: 10 l/min
To'lqin uzunligi Fe uchun: 259.94 nm
IBP-OES apparatining asosiy komponentlari. 1. Plazma generatori: - Plazma hosil qilish uchun yuqori chastotali radiochastota (RF) generator ishlatiladi. RF energiya plazma hosil qilish uchun kerakli energiyani ta'minlaydi.

2. Atomizator: - Namuna eritmasini mayda tomchilarga ajratish va plazmaga kiritish uchun ishlatiladi. Bu komponent odatda nebulizator deb ham ataladi.
3. Spektral dispersiv sistema: - Chiqarilgan yorug'likni to'lqin uzunliklari bo'yicha ajratadi. Monoxromator yoki polixromator spektral dispersiv sistema sifatida ishlatiladi.
4. Detektor: - Chiqarilgan yorug'lik intensivligini o'lchaydi. Detektor odatda fotomultiplikator trubkasi yoki yarimo'tkazgich detektor bo'lishi mumkin.

IBP-OES usulining afzalliklari. 1. Yuoqori sezgirlik:- IBP-OES juda past konsentratsiyalardagi elementlarni aniqlash imkoniyatiga ega.
2. Keng dinamik diapazon: - Usul keng dinamik diapazonda aniqlik bilan o'lchash imkonini beradi.
3. Ko'p elementli tahlil:- IBP-OES bir vaqtning o'zida ko'p elementlarni aniqlash imkoniyatini beradi.
4. Tezlik va samaradorlik:- Tahlil jarayoni nisbatan tez amalga oshadi, bu esa yuqori samaradorlikni ta'minlaydi.

Olingan natijalar. Ikkala na'munadan 0.643 g (eritma) va 0,157 (kukun) g dan massa tortib olindi va uning ustiga 1 ml distillangan suv 2 ml kons. nitrat kislota, 1 ml vodorod peroksid qo'shildi va mikroto'lqinli pechga qo'yildi. Pechdan olingan eritma suyultirildi va ISP-OES apparatida tekshirildi.

Natijalarning aniqligini tekshirish maqsadida 38 ppm lik Standard na'muna ham analiz qilindi va qayta tiklanuvchanlik foizi 95% ekanligi aniqlandi.

Olib borilgan ilmiy izlanishlar natijasida quyidagi natijalar olindi. “FER-RICH” eritmasida temir miqdori 78700 ± 3935 ppm (7.87 % ± 0.3935%) ni tashkil etti. Temir (III) gidroksid polimaltozat $[Fe(OH)3]n\cdot(C_{12}H_{22}O_{11})m$. “FER-RICH” eritmasida temir miqdori 7, 87% ekanligi ma’lum bo’ldi.

Xulosa. “ FER-RICH” eritmasi tarkibidagi temir miqdorini induktiv bog’langan plaz,ali optik emission spektofotometriya usulida aniqlandi. “FER-RICH” eritmasi tarkibidagi temir miqdori 7.87% ekanligi aniqlandi.

Influence Of The Digital Economy On Sustainable Economic Development Of The Regions Of Uzbekistan

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Abstract
This paper investigates the transformative role of the digital economy in fostering sustainable economic development across the diverse regions of the Republic of Uzbekistan. Through an integrated analysis of digital infrastructure, public policy frameworks, and regional development indicators, the study assesses how digital technologies are influencing inclusivity, productivity, and ecological resilience. Employing a mixed-methods approach, the research synthesizes statistical data with strategic policy analysis, supported by region-specific case studies. Findings indicate that while digitalization has accelerated economic diversification and public service efficiency in urban centers, structural and institutional gaps continue to hinder similar progress in rural and peripheral regions. The paper concludes with evidence-based recommendations for balanced digital development, underscoring the imperative of equity-oriented policy design and localized innovation ecosystems.
Keywords: Digital Economy, Regional Development, Sustainability, Uzbekistan, ICT, E-Government, Digital Inclusion.

Introduction

The emergence of the digital economy, driven by the convergence of information and communication technologies (ICT), data analytics, and platform-based business models, is reshaping economic landscapes worldwide. For transitional economies like Uzbekistan, digital transformation offers a unique opportunity to leapfrog traditional development trajectories by enhancing productivity, reducing regional disparities, and fostering environmentally sustainable growth (UNCTAD, 2019). The Government of Uzbekistan has actively embraced digitalization as a pillar of its long-term development agenda, with initiatives such as the "Digital Uzbekistan – 2030" strategy aiming to build a competitive, inclusive, and knowledge-based economy. However, the spatial diffusion of digital benefits across regions remains uneven, raising critical questions about equity and sustainability. This paper explores the interplay between digitalization and regional sustainable development in Uzbekistan, focusing on how the digital economy can act as a catalyst for inclusive growth and ecological stewardship.

Literature Review

The digital economy is increasingly acknowledged as a fundamental enabler of sustainable development through its impact on productivity, social inclusion, and environmental governance (UNDP, 2022; OECD, 2020). Scholarly contributions underscore that digital infrastructure, coupled with digital skills and enabling institutions, enhances regional resilience and fosters innovation ecosystems (World Bank, 2021). Brynjolfsson and McAfee (2014) highlight the capacity of digital technologies to automate routine tasks, lower transaction costs, and create new market opportunities, while Castells (2010) situates digitalization within broader socio-technological transitions that shape economic modernization.

In the post-Soviet context, structural legacies such as centralized planning, outdated infrastructure, and uneven institutional capacity continue to shape digital development outcomes. Kreitem, Ragnedda and Muschert (2020) emphasize the persistence of the digital divide in Eurasian economies, noting that rural and peripheral regions often lack the foundational infrastructure required for meaningful digital participation. For Uzbekistan, empirical evidence from Erasmus Centre of Excellence in Sustainable Business and Finance (n.d.) and United Nations Economic Commission for Europe (2022) confirms that digital

development has been spatially skewed toward metropolitan areas, with rural populations facing compounded barriers of affordability, skills gaps, and institutional underreach.

Notably, the United Nations Development Program (UNDP, 2022) highlights that while progress has been made in e-governance and broadband penetration, a significant portion of the population remains digitally marginalized. Moreover, international comparisons suggest that countries that embed digital inclusion within broader sustainable development frameworks tend to achieve more balanced growth outcomes (ITU, 2021). Therefore, understanding the regional dynamics of digital development in Uzbekistan is essential for designing policies that promote both technological advancement and territorial cohesion.

Methodology

This study adopts a mixed-methods research design to capture the multifaceted nature of digital transformation and its regional implications. Quantitative analysis is based on disaggregated data from the State Statistics Committee of Uzbekistan and other reliable sources, including indicators on internet penetration, GDP per capita, employment trends, and ecological sustainability. These datasets were examined using descriptive statistics and various correlation coefficients to identify patterns and relationships.

Complementing the quantitative strand, a qualitative content analysis was conducted on national and regional policy documents, notably the “Digital Uzbekistan – 2030” program, regional development strategies, and sectoral digitalization plans. Case studies were developed for three contrasting regions, Tashkent city (as a digital leader), Bukhara (as a transitional region), and Karakalpakstan (as a lagging region), to provide contextual depth and policy relevance. Thematic coding techniques were employed to extract insights related to digital governance, service delivery, and sustainability performance.

Analysis and Results

Empirical results demonstrate significant regional variation in digital infrastructure, digital service usage, and economic outcomes. Tashkent city, characterized by robust public-private partnerships and innovation-driven entrepreneurship, exhibits near-universal broadband coverage and contributes disproportionately to the country’s GDP and tech ecosystem. According to DataReportal (2025), the capital hosts approximately 65 percent of Uzbekistan's registered tech startups, reflecting its status as a digital innovation hub.

Conversely, regions such as Karakalpakstan and Surkhandarya exhibit broadband access rates below 60 percent and limited institutional support for digital entrepreneurship (DataReportal, 2025). Correlation analysis reveals a strong positive relationship between ICT penetration and regional GDP per capita, suggesting that digital infrastructure significantly contributes to regional economic performance. Furthermore, regions with advanced digital ecosystems also demonstrated higher levels of small and medium enterprise (SME) activity, financial inclusion through fintech solutions, and innovation output.

Social and environmental metrics further underscore the asymmetric benefits of digitalization. Urban regions with mature digital services report higher uptake of e-health and e-education platforms, leading to better human development outcomes. Environmentally, these regions are more likely to adopt smart utility management systems and real-time pollution monitoring, contributing to improved ecological performance and resource efficiency (UNDP, 2022). In contrast, lagging regions struggle to implement such systems due to fiscal and technical constraints.

Discussion

The findings affirm the transformative potential of the digital economy in promoting sustainable regional development, but they also highlight the risks of uneven digital diffusion. This aligns with Van Dijk’s (2020) interpretation of the “Matthew Effect” in digital contexts, whereby regions already advantaged in infrastructure and skills continue to accumulate disproportionate benefits, leaving others behind. Without proactive policy intervention, digitalization could inadvertently reinforce regional inequalities and socio-economic exclusion.

Uzbekistan's digital strategy articulates a compelling vision, yet the translation of this vision into regionally responsive policies remains inconsistent. Effective digital development must be context-sensitive, leveraging local assets while addressing region-specific constraints. Investment in foundational infrastructure, especially in underserved areas, is essential but insufficient on its own. Complementary measures such as digital literacy programs, institutional capacity-building, and place-based innovation initiatives are critical to catalyzing inclusive growth.

There is considerable scope for leveraging digital tools to accelerate green transformation, particularly in agriculture, renewable energy, and disaster resilience. For example, the application of precision agriculture technologies could enhance productivity and resource efficiency in Uzbekistan's agrarian regions, while digital weather forecasting systems could improve climate adaptation planning.

Similarly, e-governance platforms like my.gov.uz and others tailored to local governance structures can improve transparency, service delivery, and citizen engagement.

Conclusion and Recommendations

The digital economy is emerging as a pivotal force in Uzbekistan's regional development landscape, offering tools to enhance productivity, equity, and sustainability. However, the benefits of digital transformation remain concentrated in a few economically dynamic regions, leaving others with constrained access and limited participation. Bridging this digital divide is imperative for achieving balanced and inclusive development aligned with strategy "Uzbekistan – 2030" and the United Nations Sustainable Development Goals.

To this end, policy efforts should prioritize the expansion of high-speed internet and digital services in peripheral regions through public funding mechanisms and universal service mandates. Capacity-building programs focused on digital skills development, particularly for women, youth, and marginalized groups, must be scaled up to ensure meaningful participation. Regional administrations should be empowered to deploy customized e-governance solutions, while innovation hubs and incubators should be established beyond the capital to stimulate local entrepreneurship. Crucially, digital transformation targets must be integrated into regional development planning and monitored through disaggregated SDG indicators to ensure accountability and impact.

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