

1. INTERNATIONAL CAPITAL

CONFERENCE ON SCIENTIFIC RESEARCH
AND TECHNOLOGICAL DEVELOPMENTS

April 26-27, 2024
Amsterdam, Netherlands



EDITOR
Miguel Gonçalves

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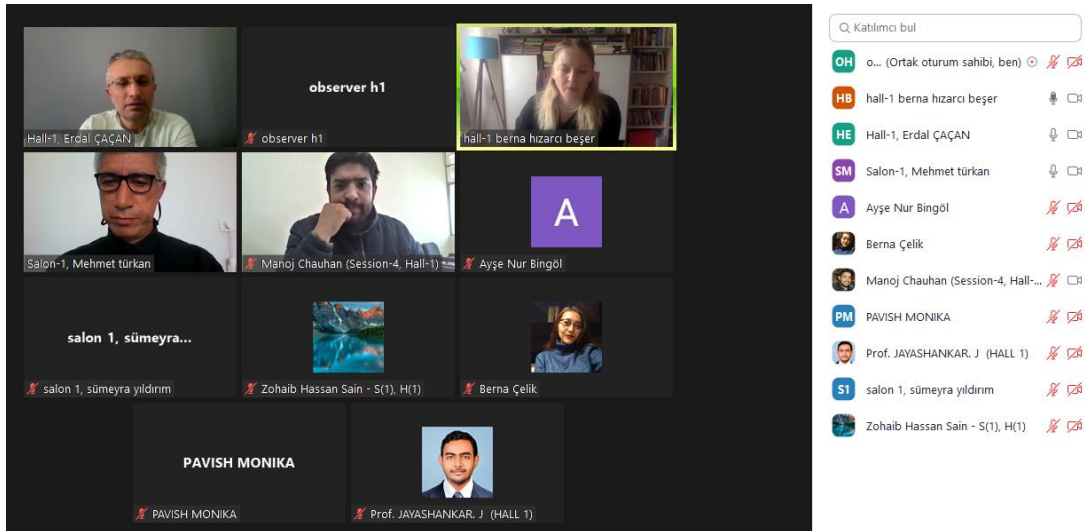
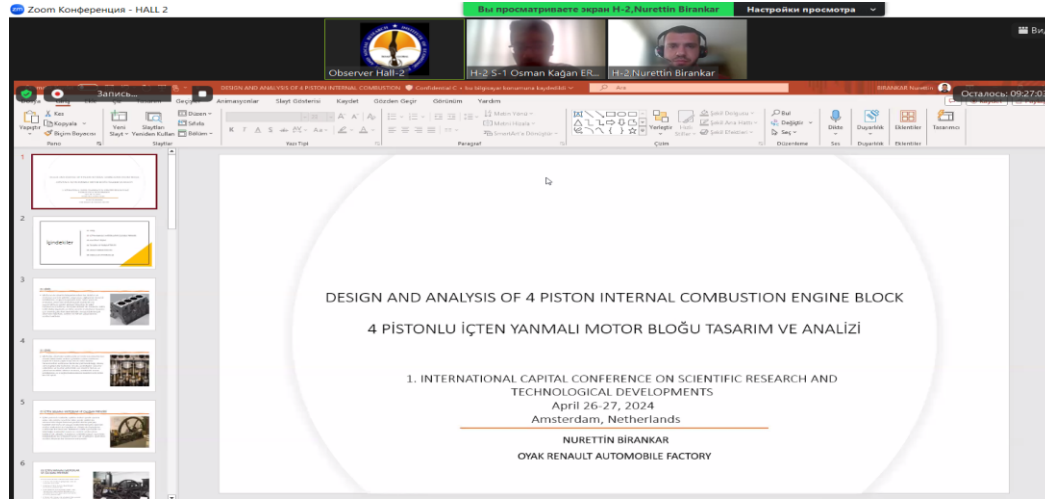
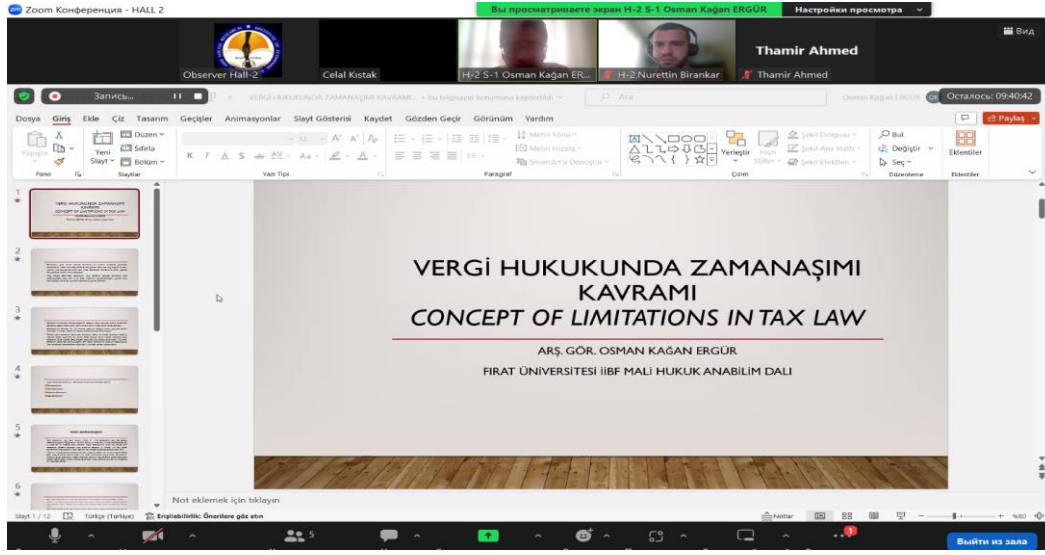
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27.04.2024 / Hall-1, Session-1

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AMSTERDAM LOCAL TIME



09 00 : 11 00



TÜRKİYE LOCAL TIME



10 00 : 12 00

HEAD OF SESSION: Prof. Bagirova Tamilla Ali kızı

AUTHOR(S)	ORGANISATION	TOPIC TITLE
Prof. Bagirova Tamilla Ali kızı	Azerbaijan State Pedagogical University, Faculty of Arts and Physical Education"	THE SYNTHESIS OF MUSIC AND WORDS IN THE WORK OF AUGUSTINE
Doc. Dr. Birsal AYBEK Gamze BAŞAKCI	Çukurova Üniversitesi	"EXAMINATION OF THE SEVENTH GRADE SCIENCE TEXTBOOK ""SOLAR SYSTEM AND BEYOND"" UNIT IN TERMS OF CRITICAL THINKING STANDARDS"
Ömer Faruk ERDOĞAN Ayşenur AKTÜRK Ömer Okan FETTAHLIOĞLU	Kahramanmaraş Sütçü İmam Üniversitesi, Sosyal Bilimler Enstitüsü	FIELD RESEARCH ON THE EFFECT OF FUTURE ANXIETY OF UNDERGRADUATE STUDENTS DURING THE EARTHQUAKE ON THEIR JOB HOPE
Bayim A. Nabiyeva	Azerbaijan State Pedagogical University, Baku, Azerbaijan	GOAL-ORIENTED EDUCATION LEADERSHIP IN SMALL COUNTRIES
Müjkan Məmmədzaadə	"Azərbaycan Dövlət Bədən Tərbiyəsi və İdman Akademiyası"	"CLASSIFICATION OF SPORTS FACILITIES AND REQUIREMENTS FOR SPORTS FACILITIES"
Saida Ahmadova	"Azerbaijan National Academy of Science Institute of Linguistics named after Nasimi"	"METHODOLOGY OF STUDYING IMAGE SCHEMAS IN COGNITIVE LINGUISTICS"

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AMSTERDAM LOCAL TIME



09⁰⁰ : 11⁰⁰



TÜRKİYE LOCAL TIME



10⁰⁰ : 12⁰⁰

HEAD OF SESSION: ASSOC. PROF. MELTEM GÜRÜNLÜ

AUTHOR(S)	ORGANISATION	TOPIC TITLE
Nihad Gurbanzada Ruslan Memmedov Aysan Farajova	Azerbaijan Technical University	"ANALYSIS AND EVALUATION OF THE IMPACT OF SUSTAINABLE DEVELOPMENT OF GREEN FINANCE APPLICATIONS IN THE REPUBLIC OF AZERBAIJAN"
Osman Kağan ERGÜR	Fırat Üniversitesi İktisadi ve İdari Bilimler Fakültesi Maliye Bölümü	CONCEPT OF LIMITATIONS IN TAX LAW
ASSOC. PROF. MELTEM GÜRÜNLÜ	ISTANBUL AREL UNIVERSITY	"AN EMPIRICAL STUDY ON THE FACTORS EFFECTING DIVIDEND PAY-OUT POLICIES: EVIDENCE FROM BORSA ISTANBUL"
ASSOC. PROF. MELTEM GÜRÜNLÜ	ISTANBUL AREL UNIVERSITY	FUTURE OF CORPORATE GOVERNANCE
Nurettin Birankar	Oyak Renault Automobile Factory	"DESIGN AND ANALYSIS OF 4 PISTON INTERNAL COMBUSTION ENGINE BLOCK"
Azeez Majeed Mohammed Thamer Mohammed Ahmed Celal Kistak Nevin Celik	Fırat University Tishk International University	PARAMETRIC STUDY OF RECTANGULAR OBSTACLES EFFECTS ON FLOW IN OPEN CHANNELS



ONLINE PRESENTATIONS

27.04.2024 / Hall-3, Session-1

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10⁰⁰ : 12⁰⁰

HEAD OF SESSION: Dr. Karimova Rena Jabbar

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Tiınçe AKSAK Ali AŞKIN Sait POLAT İbrahim Ferhat ÜRÜNSAK Özdem KARAOĞLAN	Toros Üniversitesi Sağlık Hizmetleri, Mersin Üniversitesi Fen Bilimleri Fakültesi Çukurova Üniversitesi Tıp Fakültesi Histoloji ve Embriyoloji	IMMUNOHISTOCHEMICAL EXAMINATION OF MECA-79, α4β1 INTEGRIN AND MUC-2 EXPRESSIONS IN THE SECRETORY PHASE ENDOMETRIUM OF WOMEN DIAGNOSED WITH REPEATED IMPLANTATION FAILURE
Dr. Ulviyya Sirachli	AZERBAIJAN MEDICAL UNIVERSITY	FETAL GROWTH RESTRICTION
Dr. Karimova Rena Jabbar Assoc. Prof. Aghayeva Asia Haji Assoc. Prof. Dr. Irada Aliyeva Jamilyevna Prof. Abiyev Huseyn Azizulla Jafarova Nasiba Asgar	Azerbaijan Medical University, Doctor- Neonatologist, Senior Researcher, Doctor of Philosophy in Medicine	DIAGNOSTIC METHODS AND PHYSIOLOGICAL STUDY OF THE SYNDROME OF INADEQUATE SECRETION OF ANTIDIURETIC HORMONE
Dr. Karimova Rena Jabbar Assoc. Prof. Aghayeva Asia Haji Assoc. Prof. Dr. Irada Aliyeva Jamilyevna Assoc. Prof. Aliyev Nusreddin Nadir Prof. Abiyev Huseyn Azizulla Dr. Gunel Aliyeva	Azerbaijan Medical University, Doctor- Neonatologist, Senior Researcher, Doctor of Philosophy in Medicine	AS A RESULT OF THE INFLUENCE OF DRUGS AND OTHER EXOGENOUS SUBSTANCES DIAGNOSIS, TREATMENT AND PHYSIOLOGICAL CHARACTERIZATION OF HYPOTHYROIDISM
Dr. Karimova Rena Jabbar Assoc. Prof. Xanim Aydin Assoc. Prof. Dr. Abdulkarimova Fatima Dursun Assoc. Prof. Dr. Aliyev Aydin Niftali Prof. Akhundov Ramiz Atalla	Azerbaijan Medical University, Doctor- Neonatologist, Senior Researcher, Doctor of Philosophy in Medicine	HUNTINGTON'S DISEASE GENETIC- PHYSIOLOGICAL RESEARCH, TREATMENT AND DIAGNOSTIC METHODS
DR. RUSLAN ALIYEV	AZERBAIJAN STATE ADVANCED TRAINING INSTITUTE FOR DOCTORS NAMED AFTER A. ALIYEV	PERIPHERAL ARTERIAL DISEASE
Aghayeva Asiya Zumrud Abaszade Yusufova Khadija Adil Bayramov	Azerbaijan Medical University	GENETIC BASIS OF HORMONE REGULATION AND PHYSIOLOGICAL HOMEOSTASIS



ONLINE PRESENTATIONS

27.04.2024 / Hall-4, Session-1

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09⁰⁰ : 11⁰⁰



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HEAD OF SESSION: Lecturer, PhD Irina-Ana DROBOT

AUTHOR(S)	ORGANISATION	TOPIC TITLE
Miguel Gonçalves Ana Ramos Neves Inês Reis Baptista	<i>Polytechnic University of Coimbra</i>	ACCOUNTING: HOW IT ALL STARTED AT THE END OF THE 15TH CENTURY
Miguel Gonçalves	<i>Polytechnic University of Coimbra</i>	PORTUGAL, 1759: A PEDAGOGICAL NOTE ABOUT THE FIRST ACCOUNTING SCHOOL IN EUROPE
Happy Baglari Ayushmita Dutta	<i>"Dibrugarh University, Assistant Professor, Centre for Studies in Applied Psychology, Dibrugarh, India"</i>	AN EXAMINATION OF YOUNG ADULTS' ATTITUDES TOWARDS MENTAL HEALTH ISSUES IN ASSAM
Kadir GÖKOĞLAN Musebbih ELALDI	<i>Dicle University</i>	"RESEARCH ON THE NEGATIVE EFFECTS OF TECHNOLOGICAL DEVELOPMENTS ON ACCOUNTING EDUCATION"
Kadir GÖKOĞLAN Abdulkadir BİLEN Sema ÇAKAR	<i>Dicle University</i>	RESEARCH ON THE REASONS WHY WOMEN PREFER E-COMMERCE
Lecturer, PhD Irina-Ana DROBOT	<i>"Technical University of Civil Engineering, Bucharest, Romania</i>	RELATIONSHIPS IN VIRGINIA WOOLF'S AND GRAHAM SWIFT'S WORKS

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**ANALYSIS AND EVALUATION OF THE IMPACT OF SUSTAINABLE
DEVELOPMENT OF GREEN FINANCE APPLICATIONS IN THE REPUBLIC OF
AZERBAIJAN**

Nihad Gurbanzada, Ruslan Memmedov

Supervisor: Aysan Farajova

Azerbaijan Technical University

Keywords: green finance, sustainable development, environmental policy, economic development.

This thesis aims to investigate the effects of green finance on sustainable development in Azerbaijan. The motive behind adopting green finance is to provide financial support to projects that reflect the principles of environmental sustainability. This study will look at various indicators to assess the economic, environmental and social impacts of Azerbaijan's adoption of green financial practices.

Introduction

Green finance is a financial approach that aims to direct economic activities in accordance with the principle of environmental sustainability. In this context, it aims to invest in projects that reduce environmental impacts, protect natural resources and support sustainable development. Sustainable development refers to a development model that balances society, the environment and the economy while meeting the needs of the present while taking into account the needs of future generations. These concepts aim to create a balanced relationship between economic growth, conservation of natural resources and promotion of social welfare.

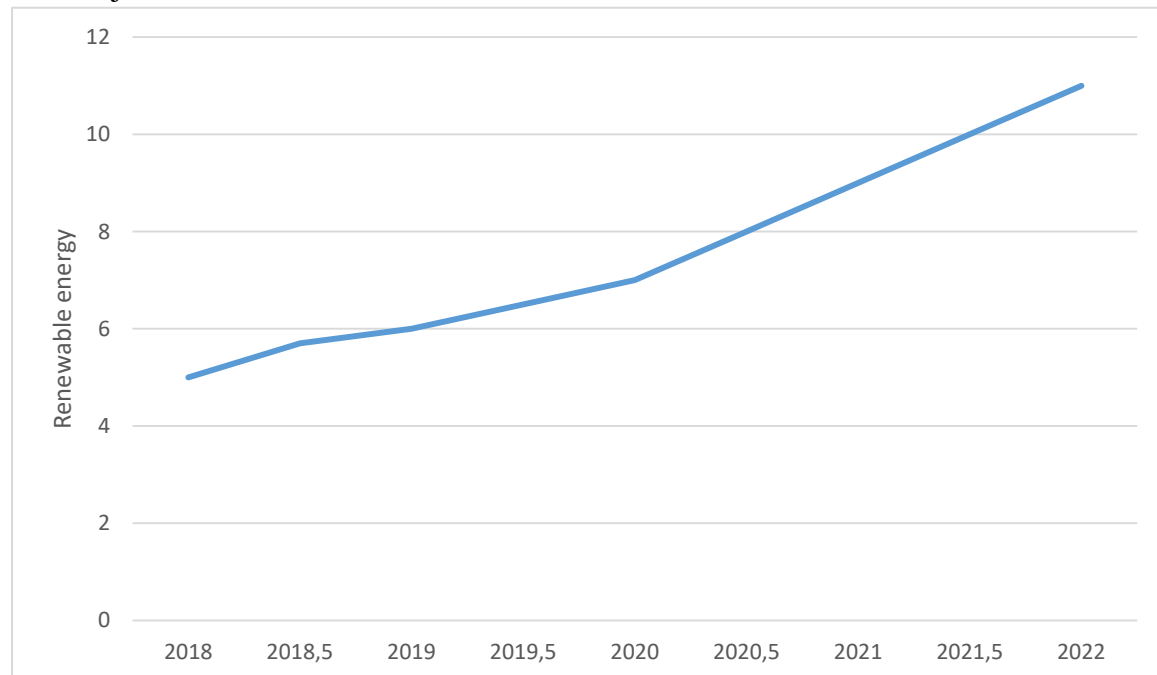
The economic and financial structure of Azerbaijan is based on an economic model based on energy resources. Although oil and natural gas are among the country's main sources of income, revenues from the energy sector have a large economic impact. Azerbaijan continues its efforts to direct the revenues from energy exports to infrastructure projects and diversification of the economy, and in parallel, there are developments in other sectors as well[1].

Green finance refers to guiding financial decisions and investments in accordance with the principle of environmental sustainability. This financing approach supports environmentally friendly projects, encourages investments that combat climate change, improve energy efficiency, protect water resources and support natural ecosystems. Elements of green finance include green bonds, sustainable loans, financial products that incorporate environmental risk assessments and sustainability criteria. These elements aim to reduce environmental impact in the financial sector and contribute to sustainable development[2].

In Azerbaijan, green finance is undergoing significant evolution in the process of the country's economic transformation and adaptation to sustainable development goals. Given

its leading role in the energy sector, Azerbaijan has focused on environmental sustainability and has invested in green projects by adopting green finance practices. The importance of green finance in the country has been integrated into Azerbaijan's development strategies, supporting efforts to reduce the impact on the environment, protect natural resources, and strengthen the economy on a sustainable path. The evolution of green finance can be seen as part of efforts to diversify Azerbaijan's economic model and emphasize environmental sustainability.

GRAPH 1. Annual Development of Renewable Energy Production and Green Financing in Azerbaijan



Azerbaijan stands out as a country that has increased its obligations in accordance with sustainable development goals. Azerbaijan has adopted the Sustainable Development Goals of the United Nations and demonstrated its determination to achieve these goals. In particular, sustainable practices in the energy sector, efforts to diversify the economy and investments in environmental projects are important steps that reflect Azerbaijan's commitments in the field of sustainable development. Azerbaijan is strengthening its national strategies in the context of sustainable development and promoting sustainable practices in various sectors[3].

Green financial applications in Azerbaijan are financial products based on the principle of ecological sustainability. These applications include green bonds, sustainable loans and other financial applications aimed at financing environmentally friendly projects. By adopting green finance applications, Azerbaijan reflects its commitment to support environmental projects and to focus its economic activities on reducing the impact on the environment. Green finance applications are increasingly important in the financial sector to support a country's efforts to achieve sustainable development goals.

Green bonds are financial instruments issued to finance environmentally friendly projects. These bonds offer investors the opportunity to support projects that meet environmental sustainability criteria.

Sustainable loans are loan products specifically allocated by financial institutions for environmentally friendly and socially responsible projects. These loans support the goals of projects to reduce their environmental impact or contribute to social development.

Other green finance applications cover a variety of financial applications and generally aim to finance projects that comply with the principles of environmental and social sustainability. These applications include applications as diverse as green bonds, green funds, and environmental risk assessment applications[4]. Green finance applications are important applications that guide the financial sector to assess environmental and social impacts and support sustainability.

Azerbaijan has developed various policies and regulations to promote green finance and support investments in sustainable projects. Some of these policies and rules include:

1. **Green Bond Issuance:** Azerbaijan has taken various steps towards issuing green bonds and aims to finance environmental projects through these bonds. These bonds are used for private and public sector projects in accordance with environmental objectives.
2. **Green Finance Strategy:** Azerbaijan has created a strategy to support the development and adoption of green finance at the national level. This strategy aims to direct the financial sector to sustainable investments by adopting the principle of environmental sustainability.
3. **Sustainable Loan Programs:** Financial institutions in Azerbaijan support projects aimed at reducing environmental and social impacts by offering sustainable loan products. These loan programs aim to finance projects that meet sustainability criteria in various sectors.
4. **Promotion of Green Finance:** The government of Azerbaijan has developed policies that include tax benefits, incentives and other economic support mechanisms to promote green finance. These incentives aim to attract green investments and promote sustainable projects.
5. **Environmental Risk Assessment:** Azerbaijan's financial sector has adopted regulations aimed at minimizing environmental impacts and making investments more sustainable by carrying out environmental risk assessment.

These policies and regulations reflect Azerbaijan's commitment to green finance and its contribution to sustainable development goals.

The impact of green financial practices on the economy of Azerbaijan can be assessed as increasing investments and strengthening the financing of environmental projects based on the principle of sustainability. These practices can contribute to a balanced combination of

environmental sustainability and economic development by supporting economic growth, especially in areas such as clean energy projects and green infrastructure works in the energy sector. Green finance can accelerate the diversification of Azerbaijan's economy and increase employment by creating jobs in environmentally friendly sectors[5].

Various indicators are used to monitor sustainable development. These indicators are intended to assess the progress of development in economic, environmental and social dimensions. Developed indicators include measurements in various areas such as poverty rates, education level, clean energy use, ecosystem protection, gender equality. These indicators provide information to policymakers and society by tracking progress towards the achievement of sustainable development goals, as well as helping to assess the impact of development efforts[6].

Measuring the impact of green finance on sustainable development in Azerbaijan requires the use of various indicators and data collection methods. There are different steps to measure these effects:

1. **Monitoring of Green Finance Projects:** Implementation and monitoring of implementation of green finance projects helps in measuring environmental impacts. The progress of projects in areas such as energy efficiency and environmentally friendly infrastructure projects can be assessed.
2. **Financial Performance Indicators:** The impact of green financial practices on financial performance indicators can be analyzed.
3. **Environmental Indicators:** Various environmental indicators can be used to measure the impact of green finance on environmental sustainability. These indicators may include factors such as energy consumption, carbon footprint, water conservation and waste management.
4. **Monitoring social impacts:** Social indicators can be used to assess the social impacts of green finance projects. Indicators that incorporate social dimensions such as job creation and access to education and health care can help measure impacts on sustainable development.
5. **Participatory Evaluations:** Participatory evaluations that include community and stakeholder feedback can be conducted to measure impacts on sustainable development. This can help to more comprehensively assess the impact of projects on society

Green financial practices in Azerbaijan make important contributions to sustainable development. Green finance projects aim to reduce environmental impacts by supporting projects in areas such as energy efficiency, clean energy and environmentally friendly infrastructure based on the principle of environmental sustainability[7]. In addition, the adoption of green finance accelerates efforts to achieve the sustainable development goals while increasing the environmental and social responsibility of the financial sector. These

practices contribute to long-term sustainable growth by supporting the diversification of Azerbaijan's economy.

Conclusion

Adopting green finance practices to support Azerbaijan's efforts to achieve sustainable development goals has had positive environmental, economic and social impacts. Environmental investments through green finance projects include steps towards energy efficiency, clean energy production and development of environmentally friendly infrastructure. From an economic perspective, the adoption of green finance has increased the environmental responsibility of the financial sector, while supporting the growth of green project financing. Socially, it aims to improve living standards. As a result of this, the adoption of green finance in Azerbaijan has strengthened environmental, economic and social sustainability and made it possible to take concrete steps in the field of sustainable development.

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**PARAMETRIC STUDY OF RECTANGULAR OBSTACLES EFFECTS ON FLOW
IN OPEN CHANNELS**

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ABSTRACT

This study investigates the effect of regularly spaced rectangular obstructions on water flow within an open channel. The experimental setup, featuring a precisely controlled channel with transparent sides and bottom, allows precise measurements to be made. In addition, the comprehensive numerical model, using a k- ϵ turbulence model, replicates realistic open channel flow conditions. Three longitudinal slopes (0, 0.01772, 0.0982) were examined at different flow rates (0.0035 m³/s, 0.004 m³/s, 0.0045 m³/s).

The results showed a close agreement between the experimental and numerical data, which confirms the reliability of the model. For $S = 0$, dynamical patterns around obstacles reveal significant effects on fluid dynamics, with velocities near obstacles intensifying under increasing flow rates. Similar trends were observed for $S = 0.01772$ and $S = 0.0982$, highlighting the effectiveness of the model in capturing complex flow patterns. The recognized inconsistencies, attributable to disturbance, boundary effects, and modeling assumptions, suggest ways to strengthen the model.

In addition to flow dynamics, the study delves into the analysis of drag forces and shear stresses induced by rectangular obstacles. Drag forces show a marked trend, intensifying with higher flow rates and affecting the overall flow dynamics. Shear stress analysis reveals variations along water depth, providing important insights into the stability of the channel bed and banks.

This research provides valuable insights into the multifaceted effects of rectangular obstructions on open channel flow. The close agreement between experimental and numerical methods confirms their effectiveness in understanding and predicting flow dynamics, drag forces, and shear stress. Further analysis is recommended to improve the numerical model, enhance its accuracy, and align it with experimental observations to comprehensively understand the open channel flow dynamics in the presence of obstacles.

Key words: Open Channel, Obstacles, CFD, Flow Pattern, Flow Dynamic

1.INTRODUCTION

Water flow in open channels is an important aspect of hydraulic engineering. Obstacles of different shapes and directions can affect the flow of water in open channels. Understanding the effect of these obstructions on water flow is critical to designing hydraulic structures that can withstand the forces of water flow. Based on the foundations laid by previous studies, the primary objective of this research is to conduct an in-depth investigation into the effect of regularly shaped obstacles on water flow in open channels. Through rigorous experimental measurements and advanced numerical simulations, this research seeks to reveal the precise interactions between these factors and shed light on the fundamental mechanisms governing open channel flow in the presence of obstructions.

Exploring the effect of obstacles on open channel flow has stimulated various investigations in recent scientific literature. One notable study by Wang and Li (2018) investigated the hydrodynamics around regularly spaced triangular obstacles. Their research revealed unique vortex structures and flow patterns, demonstrating the influence of obstacle geometry on turbulence and mixing processes. At the same time, the work of Zhang et al. (2019) extended the investigation to include irregular obstacles, revealing the complexities caused by non-uniform shapes. Their findings emphasized the importance of obstacle irregularities in changing flow velocities and shear stresses, prompting further exploration into irregular geometries.

Experimental results on flow in a 16.5% inclined channel featuring different types of large-scale submerged artificial roughness elements were presented by George C. Christodoulou (2014). The study explores eight different obstacle shapes: (1) standard obstacle blocks, (2) cubes, (3) half-cubes, (4) corners, (5) cylinders, (6) vertical bars, and (7) hemispheres parallel to the sphere. The floor. the world. flow, and (8) both hemispheres are normal to flow. The effective Manning's coefficient is determined, and the corresponding equivalent sand roughness is evaluated based on depth measurements. The results are presented in non-dimensional terms and are compared to previous research. The discussion delves into the effects of obstacle shape, size, and density on flow resistance.

Chiokam Toko, D., et al. (2013) presented a brief numerical analysis of 2D open channel flow over an obstacle, focusing on friction, the interaction between air bubble and air vortex, and treating the air-water emulsion as a compressible material. Two-phase fluid Using the volume of fluid (VOF) model with the standard κ - ϵ turbulent model and two-dimensional Reynolds averaged (RANS) equations (second-order upwind diagram), the calculations are extended to Reynolds numbers (Re) and Froude numbers (Fr) for various flows. The results showed an increase in the effect of the gas phase with higher Reynolds numbers, an increase in the height of the recirculation zone downstream, and satisfactory agreement with the experimental data.

Danny Fadda and Peter Raad (1997) conducted experimental and computational studies on water flow through two-dimensional obstacles in open channels. They examined triangular and semicircular obstructions to evaluate the effect of type and size on flow. In all cases, the

upstream flow was subcritical, and the downstream flow was supercritical. Experimental results indicated that increasing the obstacle height led to an asymptotic increase in the downstream Reynolds number, while the upstream Reynolds number decreased linearly with the obstacle height. Comparisons between experimental, computational, and analytical solutions for inviscid flow, especially for triangular obstacles, indicate that fluid rotational activity only slightly affects the overall open channel flow.

Xue, Z., Zhou, L. and Liu, D., (2023) , present an accurate numerical model for one-dimensional open channel flows with variable topographic designs, specifically for rectangular channels. It includes the pressure term in the shallow water momentum equation to address actual terrain changes. Using a Harten-Lacks and van Leer (HLL) Riemann solution and an upwind scheme with a two-step random selection method, the model achieves second-order accuracy in space. Validation of hydraulic problems shows high accuracy compared to reference solutions and experimental results. Boudjelal, S., Fourar, A. and Massouh, F.(2022) combines experimental and numerical investigations of free surface flow over an obstacle. Using FLUENT software with the Reynolds-averaged Navier-Stokes turbulence model and the volume of fluid (VOF) method, simulations explore the effect of channel steepness (5%, 7%, 8%, 10%, 20%, and 50%) on up and down flow patterns. The numerical results agree well with the experimental results. It is worth noting that steeper slopes lead to a vertical flow direction at the top of the obstacle, resulting in higher water levels. In the horizontal channel, the recirculation zones elongate. This study, using the FLUENT and Reynolds stress model, examined open channel flow with vegetation patches. Results include vegetation diameter affecting wake structure, submerged conditions affecting flow velocity, and downstream flow resulting in varying velocities in vegetated and non-vegetated areas. Inundation condition and vegetation characteristics significantly influenced the Reynolds stress in the patch area.

2.EXPERIMENTAL SETUP

To assess the impact of regular obstacles on water flow within an open channel comprehensively, an open channel was assembled and prepared for full set of required measurements. The channel, 4 meters in length, 30 cm in width, and 40 cm in depth, was carefully constructed using an iron framework. The sides and bottom of the channel were created from durable glass sheets, ensuring the transparency needed for accurate measurements. The canal was fitted with a strong 11-kilowatt pump and 3-inch pipes, facilitating the smooth transport of water from a 1-cubic meter supply tank to a compact tank positioned at the channel's inception. This detailed arrangement aimed at minimizing turbulence and fostering the establishment of flow designed for precise experimentation. Additionally, the channel is facilitated for allowing the adjustments to its longitudinal slope as needed. To facilitate the measurement of various discharge values, the channel is outfitted with a regulator and a magnetic flow meter. These instruments play a crucial role in accurately determining the different discharge values during the measurements. Each type of regular obstacle was systematically distributed in a uniform manner, both in terms of shape

and spacing, within the central third of the channel, as illustrated in Figure (1). The measurements comprised assessing the depth and velocity of the flow at three designated points for every cross-section across a total of 15 sections distributed along the channel, figure (2) considering the density of obstacles in the area. Specifically focusing on obstacles, measurements were taken for each selected points and for three distinct paths. This process was repeated for each run within the three configurations approved for this study, figure (3) .



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Figure (1): Open channel lab. model.

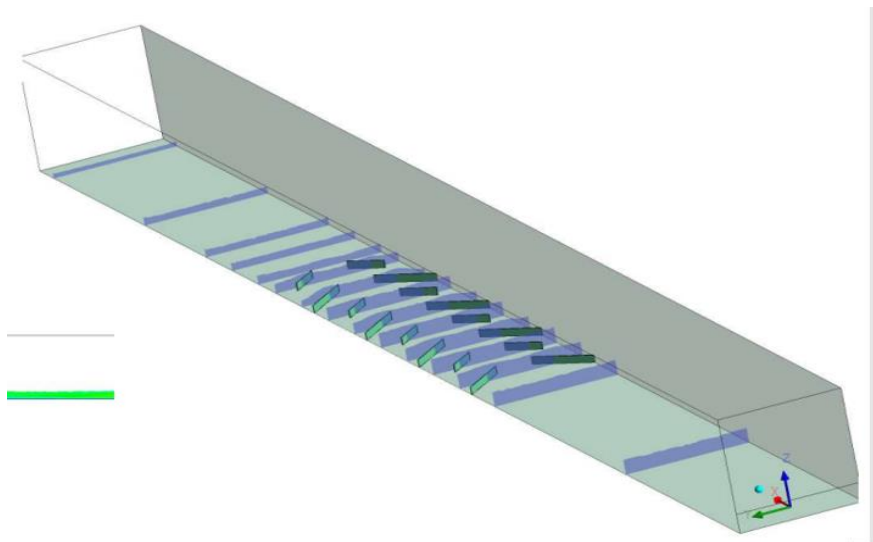


Figure (2): Layout of obstacles orientation along open channel.

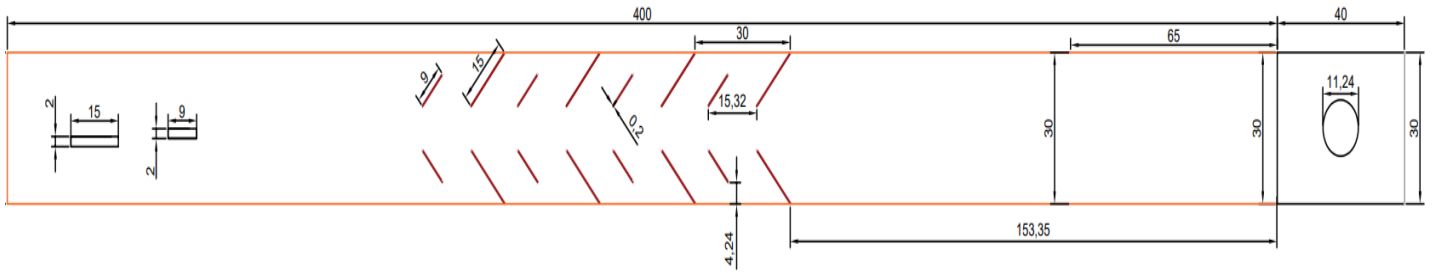


Figure (3): Considered sections of Experimental and Numerical Measurements.

3. NUMERICAL MODELING

Turbulence Modeling

The $k - \varepsilon$ turbulence model is a widely used model for simulating turbulent flows. It consists of two transport equations, one for the turbulent kinetic energy (k) and the other for the turbulent dissipation rate (ε). The turbulent kinetic energy equation for incompressible channel flow can be expressed as:

$$\frac{\partial(\rho k)}{\partial t} + \frac{\partial(\bar{U}_j k)}{\partial x_j} = \frac{\partial}{\partial x_j} \left[\left(\mu + \frac{\mu_t}{\sigma_k} \right) \frac{\partial k}{\partial x_j} \right] + P_k - \rho \varepsilon \quad (1)$$

Where μ is the dynamic viscosity, μ_t is the turbulent viscosity, σ_k is the turbulent Prandtl number for k , P_k is the turbulent production of kinetic energy and ε is the turbulent dissipation rate.

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The turbulent dissipation rate equation can be written as follows:

$$\frac{\partial(\rho \varepsilon)}{\partial t} + \frac{\partial(\bar{U}_j \varepsilon)}{\partial x_j} = \frac{\partial}{\partial x_j} \left[\left(\mu + \frac{\mu_t}{\sigma_k} \right) \frac{\partial \varepsilon}{\partial x_j} \right] + C_{1\varepsilon} \frac{\varepsilon}{k} P_k - C_{2\varepsilon} \rho \frac{\varepsilon^2}{k} \quad (2)$$

Where ε is the turbulent dissipation rate, $C_{1\varepsilon}$ and $C_{2\varepsilon}$ are model constants.

Boundary conditions

1. A free surface boundary condition is applied to the upper surface of the channel which means that the surface is open to atmospheric pressure. An atmospheric open boundary condition is often applied to the upper surface of the channel to model open channel flow. This boundary state represents the interaction between flowing water and atmospheric air above, figure (4).

2. A no-slip boundary condition is applied to the channel walls which requires that the fluid velocity be zero at the solid boundary, which means that the fluid molecules stick to the channel walls. This phenomenon ensures that a frictional interaction occurs between the fluid and the wall, which affects the overall flow behavior.

3. A Dirichlet boundary condition is used for the velocity at the water inlet port. This velocity is calculated for the flow rate for each vision condition such as:

$$V_{in} = \frac{\dot{Q}}{bh} \quad (3)$$

Where \dot{Q} is the volume flow rate of water, b is the channel width (30 cm) and h is the water inlet port (5 cm).

4. The pressure outlet boundary condition is applied at the outlet of the channel flow. This boundary condition determines the pressure at the outlet and allows the flow to adjust its velocity, thus simulating an open boundary where the flow exits the computational domain. Pressure outlet conditions are crucial to maintaining a realistic and stable simulation of channel flows by providing an adequate representation of the external environment and facilitating convergence of the numerical solution.

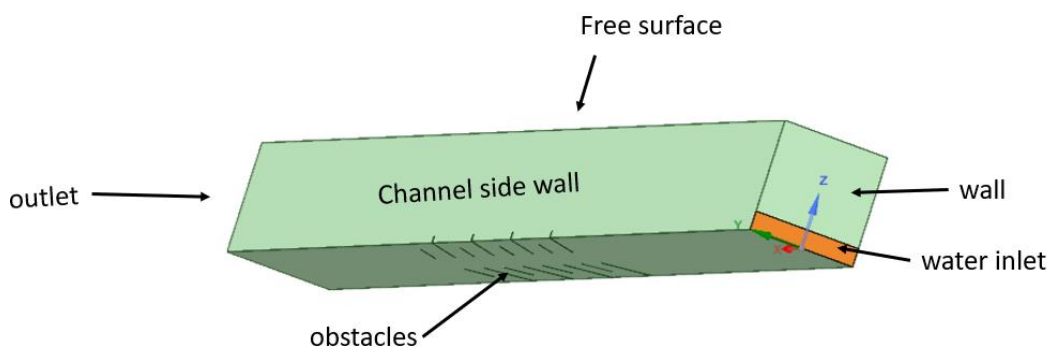


Figure (4): Boundary conditions considered for numerical analysis.

4. RESULTS AND DISCUSSION

As previously stated, rectangular obstacles were placed 153 cm from the channel inlet and extended extending up to 250 cm. This reach serves as the focal area of the study, necessitating dedicated attention to reveal its marked effect on open channel flow. The study involved examining three distinct longitudinal channel slopes, (0,0.01772,0.0982) each tested with three flow rate values, (0.0035 m^3/sec , 0.004 m^3/sec , 0.0045 m^3/sec). Laboratory preparations were made to meet criteria for accurate measurements of depth and flow velocity at various points across all selected study sections. In addition to performing extensive laboratory measurements, this study included a digital model. The boundary conditions chosen for this model agree favorably with those used for comparison, ensuring a comprehensive assessment of the validity of the numerical model. Hence, the complexities of hydraulic interactions within the channel are explored, facilitating a comprehensive understanding of the effects of introduced rectangular obstructions on flow dynamics. The results derived from both experimental and numerical models are depicted visually in Figures 5 to 7. These figures illustrate the behavior of the flow velocity, which indicates the kinetic energy of the flow, thus facilitating a smooth comparison between the two models.

4.1 Velocity Distribution for $S = 0$:

In this research section, the effect of obstructions on flow velocity behavior under different flow values, with zero channel slope is discussed, figure (5). Exploring the behavior of water velocity around a rectangular obstruction with ($S=0$) and a flow rate of $0.0035 \text{ m}^3/\text{sec}$ reveals a dynamic pattern in the selected area. The observed velocities show a gradual increase, peaking near the obstacle and stabilizing thereafter. This complex behavior indicates a noticeable effect of the rectangular obstacle on the fluid dynamics, leading to localized changes in velocity. The figure shows strong agreement between experimental and numerical velocities, confirming the accuracy of the numerical model in capturing obstacle-induced variations. This also proves the effectiveness of the model in reproducing the velocity distribution near obstacles, showcasing its accuracy in representing complex flow patterns around rectangular structures.

At a high flow rate ($Q = 0.004 \text{ m}^3/\text{sec}$), experimental results reveal a marked increase of water velocities within the defined zone, exceeding those observed at a low flow rate. The effect of the obstacle is consistently evident on the velocity distribution, especially in the vicinity of the obstacle. Remarkably, the numerical simulations agree closely with the experimental data, confirming the model's ability in replicating high velocities amid increasing flow rates. This alignment emphasizes the model's efficiency in capturing the complex interplay of flow dynamics, which is affected by both the discharge rate and the presence of obstacles.

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Under the highest flow rate condition $Q=0.0045 \text{ m}^3/\text{sec}$, the experimental results reveal a further increase in water velocities within the selected area. The presence of the obstacle continues to shape the velocity distribution, leading to noticeable changes in flow patterns near the obstacle. Numerical simulations consistently reflect experimental results, emphasizing the accuracy of the model in capturing the evolving velocity distribution near the obstacle with changes in discharge. Despite the challenges posed by high flow rate, the numerical model reproduces complex obstacle-induced velocity variations under challenging conditions. This comprehensive analysis not only confirms the reliability of the model in depicting complex water velocity dynamics around a rectangular obstruction, but also confirms its efficiency, especially under increasing discharge scenarios.

A comparative analysis crossing rectangular obstacles ranging in length from 153 cm to 260 cm reveals a clear trend. As the discharge increases, the velocities near the obstacle intensify within the defined region, highlighting the obvious influence of the obstacle on flow patterns under higher flow rate conditions. Numerical simulations consistently replicate these observed trends, emphasizing the model's ability to simulate the evolving velocity distribution near obstacles. The agreement between the numerical and experimental results enhances the reliability of the model in depicting the effect of flow rate changes on velocity patterns near rectangular obstacles.

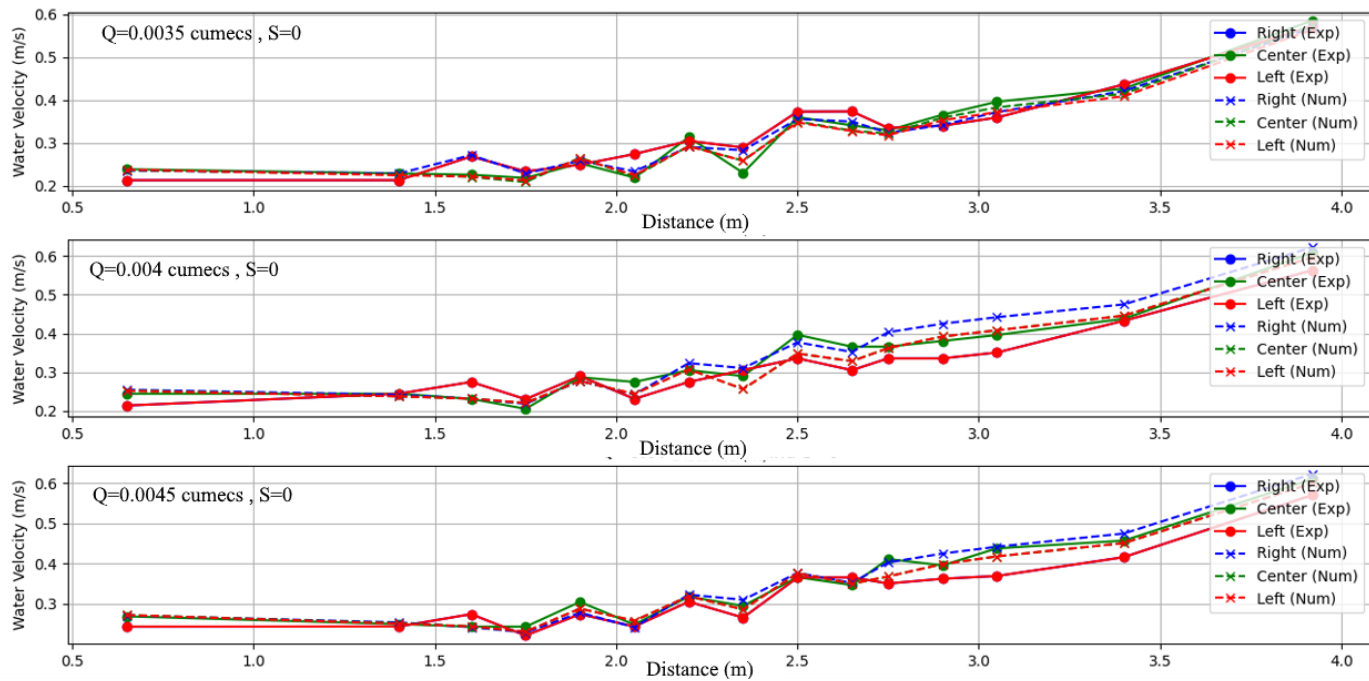


Figure (5): Experimental and numerical of velocity variation for slope=0 .

4.2 Velocity Distribution for $S = 0.01772$:

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Experimental and numerical results obtained under a discharge rate (Q) of $Q=0.0035 \text{ m}^3/\text{sec}$ and a longitudinal slope of 0.01772 provide insight into water velocity patterns in an open channel, figure (6). Differences in water velocities across the cross section reveal higher velocities in the center compared to the right and left positions. Numerical simulations reflect these differences, highlighting the dynamic flow pattern influenced by channel geometry. Localized concentrated flow is observed in specific cross sections, which contributes to the discrepancies between experimental and numerical results. The agreement indicates that the numerical model effectively captures the observed trends and confirms its reliability in replicating real-world conditions. The discrepancies are due to turbulence, boundary effects, and modeling assumptions, which warrant further analysis to improve the model.

Experimental and numerical results for water velocities in an open channel with a discharge rate (Q) of $0.004 \text{ m}^3/\text{sec}$ showed variations across the cross section, with higher velocities in the center. Numerical simulations closely reflect these differences, capturing the complexity of flow patterns affected by channel geometry. Cases of significantly higher water velocity in the center compared to the left and right positions indicate localized concentric flow. Discrepancies between experimental and numerical results are due to turbulence, boundary effects, and modeling assumptions. The agreement confirms the reliability of the model, but further analysis is needed to make improvements, considering modifications to boundary conditions, turbulence models, or mesh optimization.

Experimental and numerical results of water velocities in an open channel with a discharge rate (Q) of $0.0045 \text{ m}^3/\text{sec}$ provide insight into dynamic flow patterns. Differences in water velocities across the cross section reveal differences between the center, left, and right positions. Numerical simulations replicate these differences, indicating the model's ability to capture complex flow patterns influenced by channel geometry. The cases of significantly different water velocities in the middle, left and right positions highlight the localized concentrated flow. Discrepancies between experimental and numerical results are due to turbulence, boundary effects, and modeling assumptions. The agreement indicates that the numerical model effectively captures the observed trends, warranting further analysis to improve boundary conditions, turbulence models, or network optimization.

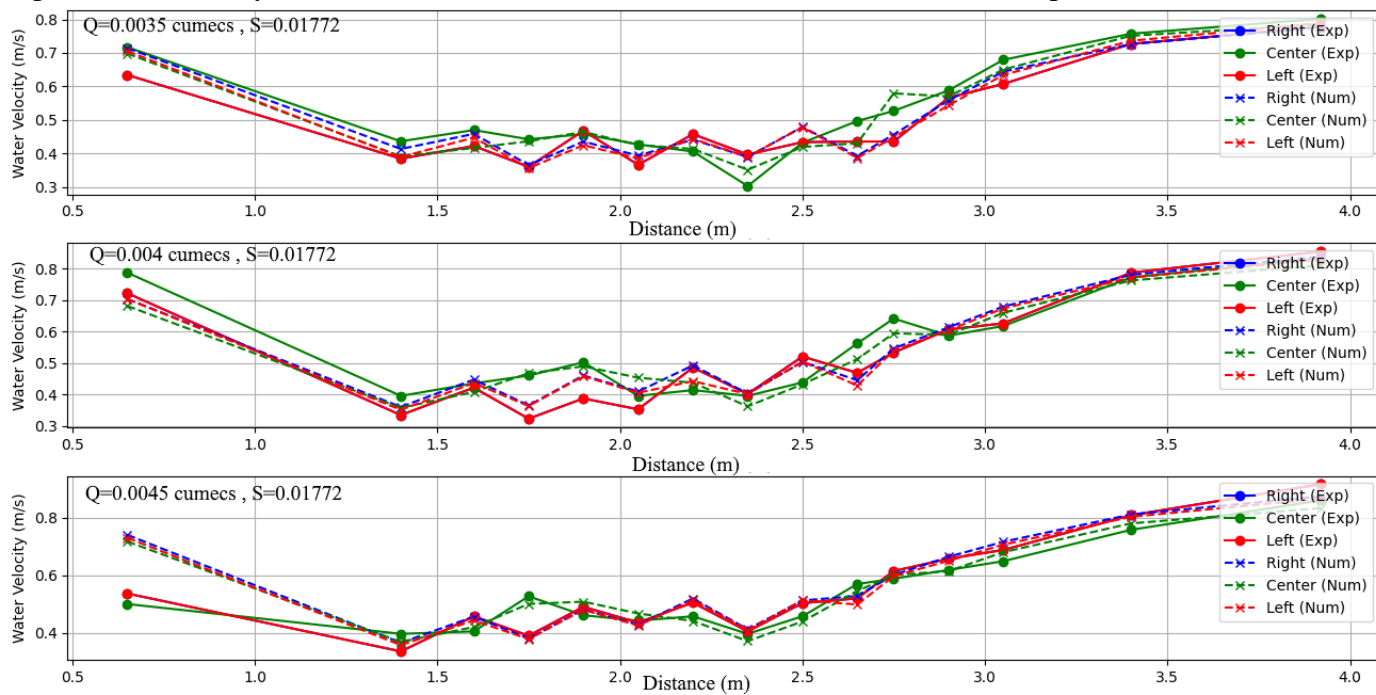


Figure (6): Experimental and numerical of velocity variation for slope=0.01772.

4.3 Velocity Distribution for $S = 0.0982$

Studying water velocities in an open channel with a discharge rate (Q) of $0.0035 \text{ m}^3/\text{sec}$ and a constant longitudinal slope ($S = 0.0982$) gives important insights into dynamic flow characteristics, figure (7). The data, which represents water velocities at different locations along the cross-section of the channel, reveal differences between the right, center, and left positions. The center consistently displays higher speeds than surrounding locations. Numerical simulations closely replicate these variations, displaying the model's efficiency in capturing complex flow patterns influenced by channel gradient. The selected cross sections highlight large variations in center velocities, indicating localized focused flow that contributes to the overall dynamic behavior of the channel. The expected discrepancies

between experimental and numerical results, which are due to factors such as turbulence, boundary effects, and irregularities in the channel setup, are evident.

Studying water velocity in an open channel with a discharge rate (Q) of $0.004 \text{ m}^3/\text{sec}$, and the same constant slope ($S = 0.0982$), provides valuable insights into flow dynamics. Differences in water velocities across the cross-section of the channel, especially between the right, middle and left positions, are evident. The center consistently shows higher velocities than the surrounding positions. Numerical simulations closely replicate these differences, indicating the model's ability to capture complex flow patterns affected by specific channel conditions. Selected cross sections reveal instances where the water velocity at the center differs markedly from the right and left positions, emphasizing localized concentrated flow. Expected discrepancies between experimental and numerical results, which are due to factors such as turbulence and boundary effects, are acknowledged.

Examining water velocity patterns in an open channel at a discharge rate (Q) of $0.0045 \text{ m}^3/\text{sec}$, with a constant slope ($S = 0.0982$), provides valuable insights into the dynamic behavior of flow under specific conditions. The data, which represents water velocities at different locations along the cross-section of the channel, highlights the differences between the right, middle and left positions. The center often shows higher velocities, which contributes to the overall complexity of channel flow. Numerical simulations closely replicate these differences, indicating the effectiveness of the model in capturing complex flow patterns affected by specific channel conditions. Specific sections reveal cases where the water velocity at the center differs significantly from the left and right positions, focusing on local concentric flow patterns within the channel. Expected discrepancies between experimental and numerical results, which are due to factors such as turbulence and boundary effects, are acknowledged.

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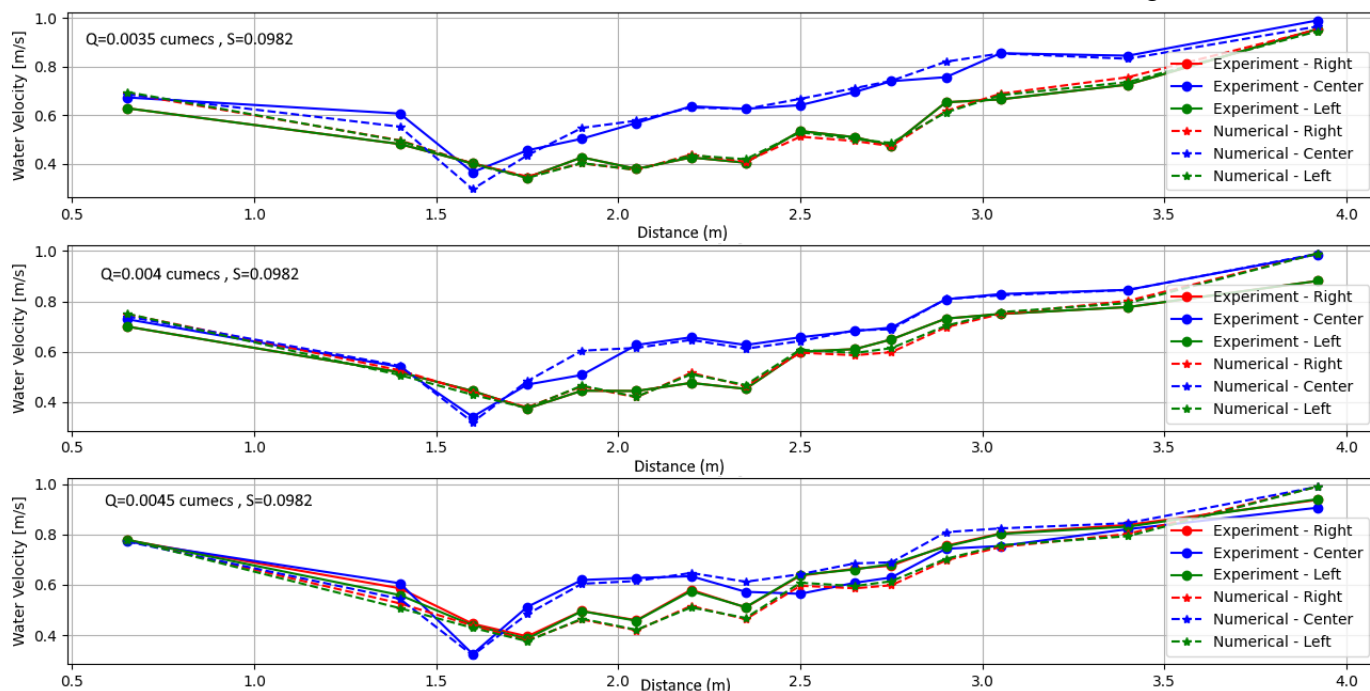


Figure (7): Experimental and numerical of velocity variation for slope=0.0982.

4.4 Drag Force:

Obstacles in open channels exert drag forces on the flowing water. The drag force is a resistive force acting opposite to the direction of flow. It arises due to the interaction between the flowing fluid and the surface of the obstacle. Understanding the magnitude and direction of the drag force is crucial for estimating the resistance encountered by the water as it moves past the obstacles. This information is valuable in designing structures like bridges or culverts where accurate predictions of drag forces are essential for ensuring structural stability. Additionally, knowledge of drag forces aids in comprehending the energy dissipation within the flow, which is vital for various engineering applications, including the design of hydraulic structures and erosion control measures. In this research, the effect of rectangular obstructions on the occurrence and distribution of drag forces across five parts of an open channel was investigated by using equation (4). These sections are located at distances of 1.53 m, 1.68 m, 1.85 m, 2 m, and 2.15 m from the starting point of the canal. The distribution of drag forces was analyzed at different points along each segment, considering obstacle characteristics based on flow velocity and depth values, as shown below, figure (8):

$$DF = 0.5 \times CD \times \rho \times A \times V^2 \quad (4)$$

Where: DF is the drag force in N, CD is the drag coefficient taken here as 1.2 [White, F.M., 2008], ρ is mass density (kg/m^3), A is the tangential obstacle area ($y \times d$), y is the distance from leading edge of obstacle m, d is the flow depth at considered section, and V is the local velocity, m/sec.

Examining the effect of rectangular obstructions on drag forces in an open channel reveals distinct patterns at different locations (X values). At X = 1.53 m, upward drag forces with higher Y values highlight the dynamic interaction between obstacles and flowing water. Downstream obstacles experience intense forces due to the cumulative effect of the upstream channel. Higher speeds are associated with increased drag forces, confirming the effect of dynamic pressure and the role of speed in shaping behavior. At X = 1.85 m, the amplification of drag forces with increasing values of Y reflects the complex interplay of flow dynamics. Obstacles respond to both upstream and downstream conditions, with higher velocities enhancing kinetic energy and intensifying the interaction. At X = 2.15 m, the continuous rise in drag forces with increasing values of Y highlights the evolving flow dynamics. Downstream obstacles experience increasing forces influenced by the cumulative effects of upstream obstacles. Speed remains axial, which increases its influence on drag forces. At X = 1.68 m, the fine drag force behavior reflects the balance between upstream and downstream effects. Increasing Y values indicate a translational response to changing flow conditions. The velocity dependence is clear, with higher flow velocities contributing to greater forces. At X = 2 m, the peak drag force is consistent with the increasing forces at higher Y values. Downstream barriers show the collective effect of upstream influences. Velocity remains dominant, amplifying dynamic stresses on obstacles and demonstrating the complex relationship between flow velocity and drag forces.

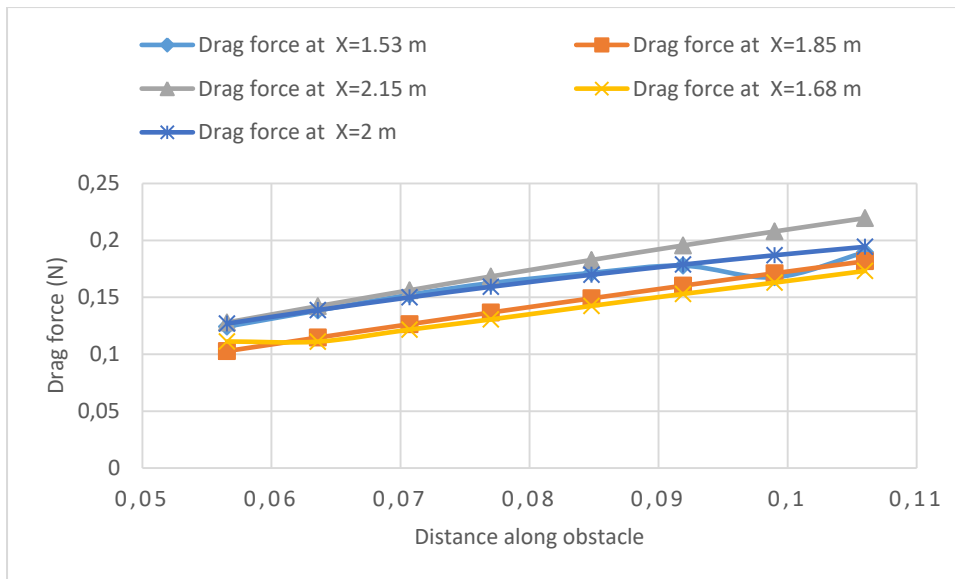


Figure (8): Drag force variation for selected sections, ($Q=0.0035$ cumecs, slope=0).

4.5 Shear resistance:

Shear resistance refers to the resistance provided by a moving fluid to the forces that tend to cause different layers of fluid to slide over each other. In the presence of obstructions, the shear resistance experienced by flowing water is greatly affected. Obstacles introduce additional complexity to flow patterns, leading to variations in shear stresses along the water depth. Understanding these differences in shear resistance is critical for assessing the stability of channel beds and banks. Moreover, shear resistance plays a pivotal role in sediment transport processes, affecting erosion and sediment deposition within the channel. Knowledge of shear resistance is essential for managing sediment transport in rivers, optimizing river training structures, and ensuring long-term stability of open channels in the presence of obstructions. In analyzing the shear stress values in different sections (1.53 m, 1.68 m, 1.85 m, 2 m, 2.15 m) of the channel entrance, a comprehensive understanding of the flow dynamics emerges. The shear stress can be estimated by using the following equation, Chaudhry, M.H., 2008:

$$\tau = \gamma \cdot R \cdot S \quad (5)$$

Where, τ : shear stress in Pa, γ : water weight density N/m^3 ,Hydraulic radius ,m ,and S:Energy slope.

At $X = 1.53$ m, a positive shear stress of 0.13 Pa indicates flow resistance. This can be attributed to factors such as bed roughness, channel geometry, or the presence of obstructions. The cumulative effect of these elements leads to increased resistance in this section. Moving to $X = 1.68$ m, the higher positive shear stress of 0.58212 Pa indicates

intensified resistance to flow compared to the previous section. This can be affected by changes in channel characteristics or the increased influence of obstructions on the flow pattern. The transition to $X = 1.85$ m introduces a noticeable shift with a negative shear stress of -0.203 Pa. Negative shear stress is less common and often refers to areas where the flow exerts a shear force on the channel bed. Possible contributing factors include flow separation, changes in bed height, or the presence of hydraulic jumps. At $X = 2$ m, a large positive shear stress of 1.1466 is observed, indicating the presence of a region of high flow resistance or changes in flow dynamics. This can be attributed to the presence of a hydraulic structure, variations in bed inclination, or cumulative effects of upstream flow affecting that section. Finally, at $X = 2.15$ m, the negative shear stress of -0.514 Pa continues to indicate the shear forces exerted by the flow on the channel bed. Similar reasons mentioned for $X = 1.85$ m may contribute to this negative shear stress.

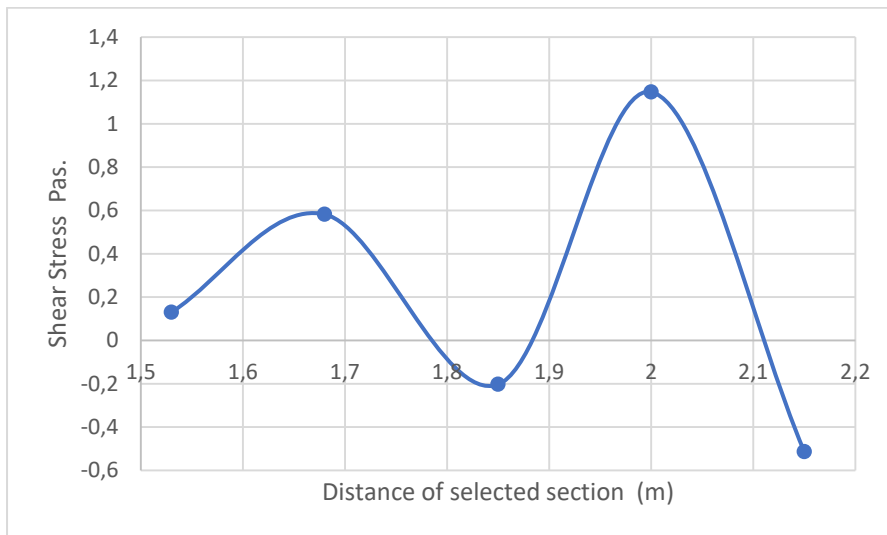


Figure (8): Shear Stress variation for selected sections, ($Q=0.0035$ cumecs, slope=0).

5. SUMMARY AND CONCLUSIONS

The study highlights the reliability of the numerical model in depicting water velocity and shear stress dynamics under different drainage rates and slopes. While acknowledging the discrepancies between the experimental and numerical results, the strong correlation coefficients confirm the effectiveness of the model.

The results contribute valuable insights into the complex interactions between flow conditions and rectangular obstacles, aiding in understanding open channel flow dynamics.

In this study, rectangular obstructions strategically placed 140 cm from the channel starting point were studied for their effect on open channel flow. The study included different flow values and longitudinal channel slopes, combining laboratory measurements with a numerical model for simulation and analysis. The velocity distribution near obstacles under different

discharge rates (Q) and slopes (S) was carefully examined. The following conclusions are drawn:

1. The study under zero channel slope revealed a gradual increase in water velocities around rectangular obstacles, inducing noticeable changes in fluid dynamics and localized alterations in velocity patterns. As flow rates increased, the effect of the obstacle on velocities intensified within the defined zone. The agreement between experimental and numerical velocities confirmed the model's accuracy, especially evident at higher discharge rates, where marked increases in water velocities were observed.
2. Examination under a longitudinal slope of 0.01772 showed varied water velocities across the cross-section, with higher velocities concentrated in the center. Numerical simulations effectively captured these flow patterns influenced by channel geometry. Discrepancies between experimental and numerical results were acknowledged, attributed to turbulence and modeling assumptions. Higher discharge rates introduced complexity, highlighting the significant influence of channel conditions on flow dynamics.
3. The study at a constant longitudinal slope of 0.0982 unveiled dynamic flow characteristics, with notable differences in velocities between the right, center, and left positions. Numerical simulations successfully captured these complex flow patterns influenced by the channel gradient. Acknowledging expected discrepancies between experimental and numerical results, the large variations in center velocities indicated localized focused flow, emphasizing the impact of specific channel conditions.
4. The analysis of drag forces demonstrated a clear trend increased discharge led to intensified velocities near obstacles within the defined region. Numerical simulations consistently replicated these observed trends, enhancing the model's reliability in depicting obstacle-induced velocity variations. The agreement between numerical and experimental results underscored the model's accuracy, especially in capturing complex interactions under higher flow rate conditions.
5. The assessment of shear stress values provided insights into the flow dynamics, indicating positive shear stresses attributed to flow resistance from bed roughness and obstacle presence. Less common negative shear stresses suggested areas where flow exerted shearing forces on the channel bed. The interplay of channel features and hydraulic elements influenced shear stress and acknowledged discrepancies between experimental and numerical results prompted further analysis for model improvement.

In summary, the study elucidates the intricate behaviors of open channel flow under the influence of rectangular obstacles, emphasizing the role of channel slope, discharge rate, and obstacle presence in shaping the observed flow dynamics. The agreement between

experimental and numerical results enhances our understanding, while identified discrepancies pave the way for refining the modeling approach.

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**METHODOLOGY OF STUDYING IMAGE SCHEMAS IN COGNITIVE
LINGUISTICS**

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Abstract

The emergence of cognitive linguistics leads to many innovations and new scientific assumptions. The main goal of cognitive linguists is to clarify the issues that researchers dealing with traditional linguistics cannot solve, combining the phenomena of abstracting and thinking with language rules. As we know, language rules exist on a specific principle, but the language of thinking is broader and more boundaryless. It is also the primary goal of cognitive linguistics to integrate and present these infinite connections based on certain principles. Human thinking is constantly evolving, and cognitive linguists also introduce principles that adapt to this rule and are relatively free. However, in cognitive linguistics, different methods are used to explore different models. The article presents the study methodology of cognitive linguistics models and image schemes.

Keywords: *cognitive, linguistics, methodology, cross-cultural, observation, experience*

Introduction

Human cognition is a multifaceted phenomenon, encompassing various mental processes that underpin our ability to perceive, understand, and interact with the world around us. If we look through cognitive linguistics in general, we observe that it is not based on a single theory, but simultaneously ingrained by different investigators based on different theories. Although there are different theories and fields in cognitive linguistics, the primary goal of the investigators in this field is to combine languages with cognitive linguistics as a single product of thinking [1].

It turns out that the foundation, which began in the 70s, paved the way for diversion and the emergence of new theories in the 80s. Jean Piaget has also paved the way for children's language research into the science of linguistics. In the 70s, when research into psychology

began to have an impact on linguistics, Noam Chomsky, who stood opposite the other side, caused some controversy. When cognitive linguists said that experiences in human life and thinking were undeniable, Chomsky made the assumption that it was due to genetic factors [2, P.4-5]. As mentioned, in the 80s, if cognitive linguistics was dominated by an exploration of the relationship between grammar and syntax, then since the early 1990s metaphor and metonymy have come to be considered the most important idealized models of cognitive linguistics. G. Lakoff and M. Johnson researched metaphors in 70-80 years, but the topic enlarged in the 90s [3, P. 40-62]. From then until the 2000s, cognitive linguistics began to develop not only alone but with the support of cognitive psychology and the influence of other neurosciences [4, P.111-116].

In many types of cognitive linguistics, image schemes play a major role. The introduction of image schemes also boosted the development of the language of artificial intelligence. Image schemes play an important role in the presentation of both metaphorical and metonymic models and in the transfer of imaginative products to language. The image schemes will also be investigated. Because cognitive linguistics is not founded on a single set of theories, its investigation is carried out in several methods.

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Main part

The method of observation is a method that plays a role in the development of many fields of science. Johnson himself pioneered human experience and imagination in image schemes. At first, Johnson emphasized that the shape of things has a major role in the creation of image schemes. In the creation of abstract concepts, metaphorical phrases, and image schemes, Johnson emphasizes that, exactly, simple image schemes derived from specific items, are influenced [5, P.225]. As we noted, language concepts that can be created by observing a sensor motor experience are identified. The method of data collection, however, groups all these language structures and introduces schemes related to their fields. Even G. Lakoff notes the kinesthetic experience in relating cognitive models. Our childhood observation makes us create different image schemas in our cognition. Thanks to these models we enlarge language vocabulary and concepts [6, P.2-25].

Another method of studying image schemes is the method of analyzing language expressions. Researchers analyze how image schemes enter language, metaphorical meaning shifting, lexical language expressions, and syntactic language structure. In this way, the image shows the relationship between schemes and concepts. According to Jean Mandler, all of these steps

start with the analysis of baby brains. Babies' learning process helps us to understand the creation and forming of image schemas. J.Mandler believes that a human's childhood experience plays a great role in understanding image schemas. Of course, we should keep in mind that cognitive linguistics, as well as image schemes, are not only of interest in the fields of linguistic science. Psychology and other neuroscience also play a major role in analyzing image schemes. Therefore, the method of analysis plays a wider role in the investigation of image schemes [7, P.137-145].

The material and experience approach are also ways in which image schemes can be studied. In this way, the image is shown by studying the schemes and what they serve in human thinking. Here, people are instructed to perform a specific action based on the image schemes given by grouping or to walk following the scheme, and try to understand the image schemes provided in accordance with their thinking based on the experience gained through the sensor motor experience. This method studies the role of image schemes in thinking [[8, P. 281-302](#)].

Cross-Cultural and Developmental Studies: A method of intersecting cultures and incidence is a method of differentiating a person's behavior and mental state according to different cultures. This method, which supports the belief that different forms of thinking are influenced by different cultures, argues that there are forms of thinking that arise through this method of how external influences affect human psychology. Here, different cultures and their path of incidence are compared. Researchers are trying to find out the reasons why image schemes are different by this method. The role of different cultures in the formation of image schemes, as well as the image schemes that individually induce infancy, are explored. This method studies **image schemes that are influenced by the environment and culture in which the person grew up.**

The cross-cultural method was first introduced by Joseph Henrich, as he explored some of the strangest people in the world. So, he explores the psychological aspect of a group of rich, poor, democratic, and queer people in different categories. It turns out that the strangest people in the world have a greater impact on society. The researcher finds that, in particular, large age groups are affected by these behavioral influences. It is determined that a baby, who grows up in a certain environment, can change his or her behavior with external influences. Thus, the changing of thinking way influences the change of image schemes as well as the creation and development of new concepts [9].

One of the ways in which characters play a role in the creation of schemes is to introduce prepositional words. Prepositional words are capable of creating abstract phrases along with specific meanings. Prepositional words are most clearly understood by a certain age group to create new abstract consonants. Psychologists have determined that infants can transfer new metaphoric models within a given time frame, ending up learning more specific phrases. For example, the phrase the book is on the table (the book is on the table) is more clearly understood by everyone, but the phrase the *book on chemistry* requires some knowledge and experience. The first ten words are understood in their own physical sense. This method is most often called the modern technology method in artificial intelligence. The method attempts to obtain correct expressions by examining the variation of image schemes according to meanings [10].

Conclusion

Through all these methods mentioned, investigators study and present the role of image schemes in cognitive linguistics in various aspects. Due to the role of language, thinking, external influences, and experience, the explanation of various image schemes can be realized by these methods. The method of observation, cross-cultural method, and studying of prepositional words demand human experience. These methods can be updated by research and new methods can be introduced.

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THE SYNTHESIS OF MUSIC AND WORDS IN THE WORK OF AUGUSTINE
AVQUSTININ YARADICILIĞINDA MUSIQI ILƏ SÖZÜN SINTEZI

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Özət

Avqustinin fəlsəfi və estetik fikirləri artıq sonrakı orta əsrlər tərəfindən qəbul edilmişdir. Onların IV-V əsrlərdə yunan kilsəsi ataları tərəfindən ortaya atılan bir çox ideyalarla da uzlaşdığı üzə çıxdı. Məhz ritmin rəssamlıq və plastika sənətinin əsas nümunələrindən biri kimi dərk edilməsi yunanlara onları musiqi sənətinin tərkibinə daxil etməyə və musiqi sənətinin ümumi nəzəriyyəsi - "musiqi" tərəfindən işlənmiş bir çox prinsipləri onlara tətbiq etməyə imkan verdi. Aristotelin davamçısı Aristid Kvintilian heykəltəraşlıqda ritm haqqında yazırdı, antik estetikanın müasir tədqiqatçıları bunu antik dövr üçün xarakterik hesab edirlər, musiqi sənətlərinin əsasını təşkil edirdi, poeziya. və həmçinin, Platonun dövründən, təsviri sənət. Musiqi elminin özü praktiki olaraq riyaziyyat elmi hesab olunurdu və son antik dövrün "7 Azad Elm" in tərkibi riyazi fənlər, arifmetika, həndəsə, fstronomoya ilə birlikdə "kvadrivia" da meydana çıxmışdır. İlk problem, təcrübədən daha uzaq olanlardan istifadə etmək üçün bu nisbəti tənzimləmək üçün qədim nəzəriyyəçilərin təcrübəsindən yarandı, yəni Avqustinin dövründə praktiki musiqçinin bir elm olaraq "musiqi" ilə heç bir əlaqəsi olmayan hesab olunurdu.

Açar sözləri: nəzəriyyə, koloristik, prinsip, element, sənət, kompozisiya

Abstract

Augustine's philosophical and aesthetic ideas were already accepted by the later Middle Ages. It turned out that they were in agreement with many ideas put forth by the Greek church fathers in the IV-V centuries. allowed them to apply. Aristides Quintilian, a follower of Aristotle, wrote about rhythm in sculpture, modern researchers of ancient aesthetics consider it characteristic of antiquity, it was the basis of musical arts, poetry. and also, from the time of Plato, the fine arts. The science of music itself was practically considered a science of mathematics, and the composition of the "7 Free Sciences" of late antiquity appeared in the "quadrivia" together with mathematical subjects, arithmetic, geometry, phstronomy. The first problem arose from the practice of ancient theorists to adjust this ratio to use those more distant from experience, that is, in Augustine's time the practical musician was considered to have nothing to do with "music."

Keywords: theory, coloristic, principle, element, art, composition.

Qiriş

Musiqi tarixindən aydın olur ki, qədim yunan mədəniyyəti Qərb və Şərqi musiqi yaradıcılığına böyük təsir göstərmişdir. Məhz orada “musiqi” termininin özü yarandı, musiqi nəzəriyyəsi və musiqi estetikası inkişaf etdi. Musiqi, Aristotela görə (“Siyasət”) qrammatika, gimnastika və rəsm ilə yanaşı, qədim təhsilin dörd əsas fənnindən biridir. Qədim Yunanıstanda musiqinin müalicəvi gücü var idi və Pifaqor məktəbində bütün tələbələrin günün sonunda, yatmadan əvvəl mahnılar və ilahilərlə zəhnini təmizləmək adət idi. Platon da deyirdi: “Musiqi düzgün şəkildə tətbiq etsəniz, sağlamlığa faydalı təsir göstərir”.

Qədim dövr nəzəri əks etdirməyin üç modelini, əslində isə əsas biliklərin riyazi, fəlsəfi və məntiqi növlərini formalaşdırır. Riyaziyyat - təcrübənin istisnasız olaraq bütün hallarda təcrübə ilə təsdiqlənən və buna görə də insanlar tərəfindən heç bir əks olunmadan, "apriori" qəbul edilməyə başlayan təcrübə hissəsindən böyüyür: hər hansı bir obyektiv ehtiyac əvvəlcə göstəriləlidir, yoxdur və prinsipə təyin olunmayan hər hansı bir ehtiyac obyekt ola bilməz, yaxud heç bir mahiyyəti mənası olmayan əlamət ola bilməz.

Əsas bilik növlərindən birincisi olaraq, riyaziyyat digər bilik növlərinə nəinki, hətta konkret aparatla deyil, aksomatiklik standartı kimi təsir göstərir. Humanitar biliklər üçün bu, məsələn, pedaqoji və linqvistik axtarış nəzəriyyəsinin ciddiliyini, dilin fonoloji sistemlərində riyazi ekspressiv əlaqələri və ya sənətdə ritmik, koloristik və kompozisiya prinsiplərinin struktur transformasiyalarını, tarix elmində statistik elementlərdən istifadə prinsipləri və s.

Nəzəri təfəkkürün daha iki nümunəsi qədim dövrdə fəlsəfi biliklər və biliklərin məntiqi növləri əsasında formalaşır. Tipoloji nöqtəyi-nəzər bizi onları nisbətən müstəqil hesab etməyə məcbur edir, baxmayaraq ki, qədim ənənə məntiqi fəlsəfi bilikdən dərhal ayırmır, lakin müasir dövrdə məntiqin filosoflar tərəfindən mənimsənilmədiyi aydın olur, onun fəlsəfə və riyaziyyatla əlaqəsi ən qızgın müzakirələrin arenasına olaraq qalır. Qədim dövrün fəlsəfə və məntiqinin nisbətən müstəqil bilik növləri kimi yetişdirilməsinin obyektiv əsası, birincisi, onların cəmiyyətin praktik həyatında öz köklərinin olması, ikincisi, öz əsaslarına əks olunmasının xüsusi növüdür.

Məntiq xüsusi bir əks etdirmə növü kimi tarixən insanların sosial təcrübəsinin qədim dövr polisinin daxili-kollektiv həyatı ilə bağlı olan, sosial həyatı fərdi və sosial prinsiplər arasında daimi mübarizədən ibarət olan hissəsi tərəfindən yaranır. Onların ahəngdar münasibətinin, ümumiliyinin, fikir toqquşmasında, davamlı müzakirə dialoqunda həyata keçirilməsinin ölçüsüdür. Qədim dialektikanın formalaşmasının məntiqi-kulminasiya nöqtəsi məzmununda fəlsəfənin bütün inkişaf xətlərinin kəsişdiyi Platon fəlsəfəsinə düşür. Platonun fəlsəfəsi polis həyat tərzinin mədəni və tarixi əsası kimi mifologiyanın nəzəri yenidən qurulmasının bir formasıdır. Mifologiyanın və onun fəlsəfəsinin bu intibahı bir qədər gözlənilməz görünür - Sokrat məktəbi özü də yaşlı sofistlər nəsli və hətta ondan əvvəl Eleatom Kenofan (e.ə. I əsr) tərəfindən başlayan ənənəvi mifologiyanın tənqidinə uyğun olaraq inkişaf edir.

Qərbin çardağ və xüsusilə orta əsr estetik düşüncəsi sənətin ədədi ritmik təşkilinə çox diqqət yetirirdi. Məhz ritm idi ki, artıq yunan klassikləri dövründə düzgün estetik kateqoriya kimi tanınan ilklərdən biri idi. Yunanların rəqs, musiqi, poeziya və Platon dövründən bəri təsviri

sənəti daxil etdiyi bütün musiqi sənətlərinin əsasını təşkil etdi. Məhz ritmin rəssamlıq və plastika sənətinin əsas nümunələrindən biri kimi dərk edilməsi yunanlara onları musiqi sənətinin tərkibinə daxil etməyə və musiqi sənətinin ümumi nəzəriyyəsi - “musiqi” tərəfindən işlənmiş bir çox prinsipləri onlara tətbiq etməyə imkan verdi.

İşləmə

Aristotelin davamçısı Aristid Kvintilian heykəltəraşlıqda ritm haqqında yazırdı, antik estetikanın müasir tədqiqatçıları bunu antik dövr üçün xarakterik hesab edirlər, musiqi sənətlərinin və poeziyanın səsini təşkil edirdi və həmçinin, Platonun dövründən, təsviri sənətin. Beləliklə, qədim ənənədə poeziya və musiqi ilə bağlı qaldırılan ritm və say problemlərinin bir çoxu sənətin bütün növlərinə aid görünürdü, o cümlədən, ilk Avqustinin “Musiqi haqqında” (1,51) traktatının 4-cü kitabında. “Sərbəst elmlər” korpusunda hələ estetikaya yaxın olan bir elm və ya gözəllik elmi yox idi, təbii ki, heç kim mövcud olmayan elmə xüsusi risalələr həsr etməmişdir. Buna baxmayaraq, hətta Avqustinin ilk fəlsəfi əsərlərinin kiçik bir hissəsini bağlayan ilk əsəri, demək olar ki, tamamilə estetikanın səlahiyyətinə aid olan məsələlərə həsr edilmişdir. O 389-391-ci illər arasında "Musiqi haqqında" traktatı tamamlamış. (2, 91)

Müəllifin 5-ci kitabda "musiqi"nin materialı ilə bağlı gəldiyi qənaətlər, demək olar ki, o dövrün bütün "elm və incəsənət"lərinə aiddir. Ola bilsin ki, qismən buna görə də Avqustinə bu kitabı bitirdikdən sonra başqa “elmlər” haqqında traktata sahib olmaq və hətta musiqi haqqında essenini bitirməyə ehtiyac qalmadı. Qədim dövrlərdə musiqi ilk növbədə xüsusi nəzəri intizam kimi başa düşülürdü ki, onun əsas müddəaları bizim sözü anlamaqda təkcə musiqi sənətinə deyil, həm də rəqsə, şeirə, teatr tamaşasına, ritorikaya, incəsənətə şamil edilirdi. Platon hətta fəlsəfəni də musiqi sənətinə sənətlərin ən yüksəki kimi aid edirdi, çünki hikmət onun tərəfindən “ən gözəl və ən böyük ahəng” və ya harmoniya, simfoniya kimi başa düşülürdü.

Seeckt Empiricus musiqi haqqında daha dar gec antik anlayışı yekunlaşdıraraq yazırdı: “Musiqi üç mənada danışılır. Birinci mənada (melodiya haqqında, səs haqqında, ritmin yaradılması və buna bənzər mövzular haqqında bir növ elmdir. ..ya harmoniya hesab edirdi. (3, 499). İkinci mənada (bu) alətlə bağlı təcrübə bacarığıdır, ona görə də biz fleyta, arfa və ya arfa çalmaq məcazi mənada bəzən müəyyən mövzular sahəsində uğurlu çıxışı eyni adla çağırmağa adət etmişik. Deməli, məsələn, müəyyən əsərin rəsm növü olanda da musiqililiyi ilə seçildiyini deyirdilər.(4, 192)

Birinci mənada musiqi qədim nəzəriyyəçiləri daha çox maraqlandırır, baxmayaraq ki, onlar bu teoremi səs sənəti kimi praktiki musiqi ilə kifayət qədər sıx bağlamışlar. Pifaqorçulardan qalma iki əsas problem qədim nəzəriyyəçilərin diqqət mərkəzində idi. Birincisi, musiqi etnosunun problemi musiqinin insan psixikasına yönəldilmiş təsiri, müəyyən musiqi üsullarının köməyi ilə uyğun əhval-ruhiyyənin yaradılmasıdır.

İkincisi, dünyagörüşünü, bütün elmləri və sənətləri say üzərində quran Pifaqorçulardan başlayaraq musiqinin ədədi nəzəriyyəsi, yəni hər şeydə rəqəmlə sıx əlaqəli ədədi nümunələri görürlər. Musiqinin ritmik və harmonik əsasları ədədi qanunauyğunluqlarda görünür. Musiqi elminin özü praktiki olaraq riyaziyyat elmi hesab olunurdu və son antik dövrün “7 Azad Elm”in tərkibi riyazi fənlər, arifmetika, həndəsə, astronomiya ilə birlikdə “kvadrivya”da

meydana çıxmışdır. İlk problem, təcrübədən daha uzaq olanlardan istifadə etmək üçün bu nisbəti tənzimləmək üçün qədim nəzəriyyəçilərin təcrübəsindən yarandı, yəni Avqustinin dövründə praktiki musiqçinin bir elm olaraq "musiqi" ilə heç bir əlaqəsi olmayan hesab olunurdu. Musiqi ya məhz buna görə də əsl musiqiçi musiqi ifa etməyi və ya bəstələyə bilən deyil, musiqi nəzəriyyəçisi hesab olunurdu. Avqustin yunan təlimlərinin latın tərcüməçiləri Terentius Varro və Terentius Maurus vasitəsilə musiqinin, ilk növbədə pifaqorçuların bədii nəzəriyyələrini yaxşı bilirdi.

Bu nəzəriyyələrə əsaslanaraq, sanki öz risaləsinin 5 kitabında onları ümumiləşdirir. Avqustin Platon və xristian təlimlərinin təsiri olmadan deyil, 6-cı kitabda musiqi nəzəriyyəsinin ənənəvi üfüqlərini genişləndirməyə çalışır, xüsusən də duyğu və hətta, estetik qavrayış probleminə böyük diqqət verib. Bu baxımdan, Avqustinin "Musiqi haqqında" risaləsində nəinki birbaşa sələfləri, hətta ən yaxın davamçıları da yoxdur. Musiqiyə dair risalələr qədim müəllifləri - Aristoksan, Filodim, Qaudensi, Klavdi, Ptolemey, Geramalı Nikomax bu problemə belə yaxınlaşmırlar. Musiqi haqqında yazan erkən orta əsr müəllifləri - Boethius (480-525), Kassiodor (480-575), İsidore of Sevilla (580-640) daha çox antik müəlliflərə arxalanırdılar.

Avqustinin fəlsəfi və estetik fikirləri artıq sonrakı orta əsrlər tərəfindən qəbul edilmişdir. Onların IV-V əsrlərdə yunan kilsəsi ataları tərəfindən ortaya atılan bir çox ideyalarla da uzlaşdığı üzə çıxdı. Deməli, Avqustinin 6 kitabı "Musiqi haqqında" müəllifin qeyd etdiyi kimi, sözün geniş mənasında ritm haqqında, daha dar desək, incəsənətin ədədi qanunları haqqında essedir. İlk 5 kitab dəyişən rəqəmlərə, 6-sı dəyişməzliyə həsr olunub. Birincidə musiqi və incəsənətin mahiyyəti ilə bağlı suallara baxılır, ədədi estetika prinsipləri qeyd olunur.

İki-beş kitablar metr və ritm problemlərinin təhlilinə həsr edilmişdir. Altıncıda, duyğu qavrayış və əqli mühakimələr, əbədi dəyişməz şeylər, ali ideallar yolunda sənət və elmin yeri və rolu məsələləri qaldırılır. Lakin bu "birbaşa" problemlərlə yanaşı, əsər bütün rəşadət varlığının müəyyən prinsipi kimi dünyanın ədədi quruluşu ideyaları, birlik qanunları və bərabərlik, mütənasiblik və mütənasiblik ideyaları ilə birləşir və nüfuz edir, xüsusən də, incəsənəti.

"Musiqi haqqında"risaləsi qədim dövr üçün müəllim və tələbə arasında ənənəvi dialoq şəklində yazılmışdır ki, bu da Avqustinə müəyyən bir problemin həllinə yanaşmaq, müəyyən bir nəticəni müzakirə etmək, onu hər tərəfdən nəzərdən keçirmək imkanı verir. Digər tərəfdən, Avqustin özü yepiskop Memoriyə yazdığı məktubda buna işarə edirdi: "Bu forma tez-tez traktatın bəzi müddəalarını başa düşməyi çətinləşdirir".

Avqustin araşdırmasına musiqinin tərfi ilə başlayır. Hətta "Sərbəst haqqında"risaləsində o, "azad sənətlər"in və ya azad elmlərin mənşəyi, mövzusu və məqsədləri məsələsi ilə maraqlanırdı, onların arasında musiqini bir elm hesab edirdi, "qismən hissdən, qismən də ağıldan". Avqustin, Kassiodorusun artıq qeyd etdiyi kimi, Varrodan götürdüyü ənənəvi qədim musiqi tərfi ilə başlayır - "musiqi yaxşı mütənasiblik (modulyasiya) haqqında elmdir ki, bu da ölçü, ritm, ölçülüb-biçmə məzmununu ifadə edir və modulyasiya ilə əlaqəli deyil, tonallığın dəyişməsi deyil.

"Modulyasiya", Avqustin iddia edir ki, hərəkətə istinad edir və əslində, hərəkətin faiz nisbətinin bir növ "təcrübəsi" və ya "biliyi", daha dəqiq desək, hərəkəti düzgün təşkil etmək

biliyidir. Avqustin "modulyasiya elmini" yaxşı hərəkətdə olan bir elm hesab edir ki, o, özlüyündə istək yaradır.

Beləliklə, musiqinin bir sənət növü kimi tərfi əslində verilmişdir. Təsadüfi deyil ki, o, rəqsdən "maraqsız hərəkət" nümunəsi kimi istifadə edib. Musiqi, Filodimin (e.ə. I əsr) fikrincə, hələ də Demokrit tərəfindən hesab olunurdu, "ehtiyacdən yaranmışdır, praktik ehtiyaclardan deyil, artıq inkişaf edən dəbdəbədən doğulmuşdur, yarandığı gündən utilitar məqsədlərə yad idi." Plutarx musiqini "tanrıların ixtirası hesab edirdi ki, yunanların şüurunda xalis həzz, həzz, sevinc musiqi ilə əlaqələndirildi" (5, 558). Bundan əlavə, "yaxşı modulyasiya" anlayışını təyin edən Avqustin qeyd edir ki, modulyasiya "hər hansı bir müğənniyə aiddir, yalnız o, söz və səslərin müddətində günah işlətməmişdir, bu arada, yaxşı modulyasiya müəyyən edilmiş sərbəst intizamla, yəni musiqi ilə bağlıdır." Avqustinin "yaxşı formalaşdırmaq" təlimi praktik və hətta utilitar adlandırılaraq bilən qədim etos doktrinasının bir hissəsini - məhz Pifaqor, Platon, Aristotel və digər qədim mütəfəkkirlərin musiqinin instrumental təhsil kimi başa düşüldüyü mövqelərini əks etdirirdi.

İnsanların psixikasına yönəldilmiş təsir, onların xarakterlərinin korreksiyası, yəni, musiqinin sosial və etik funksiyaları vurqulanırdı. Burada səs materiyasının hərəkəti "öz xatirinə" deyil, müəyyən sosial məqsəd naminə həyata keçirilməli, musiqiçi öz zövqü üçün deyil, müəyyən xarici vəzifəyə "uyğun" ifa etməlidir.

Bu məsələdə musiqi etnosunun doktrinasının müəyyən cəhətləri Avqustini musiqi elminin tərifində bəzi ziddiyyətlərə gətirib çıxardı. Hesab edirəm ki, bu, Hüqonun bir ideoloji mövqedən digərinə keçidi ilə bağlı idi. Avqustinin orta əsr xristian davamçısı üçün musiqinin hərfi məqsədlərə "uyğunluğu" böyük əhəmiyyət kəsb edəcək. Musiqinin qeyri-faydalılığı, daxili azadlığı haqqında ifadə alimlərin akademik traktatlarında yalnız gözəl bir ifadə olaraq qalır. (Musiqinin funksiyaları dindarların dini fəaliyyətə hazırlanmasına və daxil edilməsinə qədər azaldıldı).

Hətta Milanda Avqustinin sağlığında Ambrose yerli kilsədə mahnı oxumağı sırf praktiki məqsədlə - xristian dünyagörüşünün möminlərin qəlbinə daha dərinləndirilməsi üçün təqdim etdi. Onda "elm" sözünün nə üçün musiqinin tərifinə daxil edildiyini izah etmək Avqustinə qalır. Oxumaq və çalmaq məhəbbəti, oxumaq və oynamaq bacarığı kimi insan və heyvanlar (bülbül) üçün ümumidir. Quşlar şəhvət üçün, insanlar kefi, pul, namus üçün oxuyur, amma nə biri, nə də digəri elm sahibidir. O, qədim nəzəriyyəni yaxşı bilirdi, təqlid sənətini əsaslandırırırdı. Uzun müzakirələr nəticəsində məlum olur ki, sənət sadəcə mexaniki təqlid deyil, ağılın da qafiyə ilə əlaqəsi var.

Və yenə də onların əsas fərqi ondadır ki, bu və ya digər şəkildə materiya ilə mütləq bağlı olan sənətdə təqlid üstünlük təşkil edir, elmdə isə "yalnız ruh" məsələsi kimi ağıl üstünlük təşkil edir. Həmçinin qədim mənəvi aristokratiya ənənələrində Avqustin praktika ilə nəzəriyyəni kəskin şəkildə fərqləndirir. O, təkid edir ki, musiqi alətində ifa etmək elm deyil, bacarıq və vərdiş işidir. Sadəcə camaatın qulaqlarını oxşayan, pul və ya şöhrət üçün çıxış edən teatr aktyorları, müğənnilər, musiqiçilər musiqini elm kimi bilmirlər.

Öz risaləsində “modulyasiyaya” çox diqqət yetirərək, yəni. hərəkətlərin düzgün təşkili prinsipləri, o, Pifaqorçulara və neo-Pifaqorlu ədədlər doktrinasına müraciət edərək, onun emosional yönümünü gücləndirir və bir çox cəhətdən Qərb orta əsrlər estetikasının əsaslarını qoyur. O, tədqiqatlarında əsas diqqəti musiqidə rəqəmlərə yönəldir, hesab edir ki, bütün kvadraviya elmlərini vahid bir bütövlükdə birləşdirən rəqəmlərdir və musiqi nəzəriyyəsi və musiqi sahəsində özünü evdəki kimi hiss etməsə, heç kəs ilahi vəhyin etibarını qazana bilməz. Avqustin musiqinin tərifini verərək, “maddi estetik obyektlərdə musiqinin izlərini (2-5 kitabda) poeziya timsalında ortaya qoyur və sonra musiqinin mahiyyətinin təhlilinə keçir. Avqustin ayaqların bütün variantlarını sadalayır. Latin poetikası tərəfindən qəbul edilmiş ənənəvi yunan adlarını göstərir. Bir-biri ilə bərabərlik və müvəqqəti koordinasiya əsasında bağlanan ayaqlar müxtəlif ritmlər əmələ gətirir. Beləliklə, ritm zamanla sonsuz təkrarlanan ardıcıl ayaqların müəyyən birləşməsidir. Ümumiyyətlə, bu fikirlər praktiki olaraq bütün antik müəlliflər üçün ümumi idi. Avqustin onları həm kiçik yoldaşı və dostu Siserondan, həm də Terentian Maurusdan tapa bilirdi. Siseron “Natiq haqqında” risaləsində xüsusi olaraq ritmdən bəhs edir. “Çıxışçılar nitqində ritmdən istifadə etməyə başladılar ki, qulağa xoş gəlsin. Bir vaxtlar həm də şair olan musiqiçilər sözün ritmi və səsin melodiyası ilə dinləyiciləri sevindirmək və doydurmaq üçün ləzzət vermənin iki yolu - poeziya və oxuma yolu ilə ortaya çıxdılar.” (6, 173-198)

Nəticə

Yunan musiqi sənətinin fəlsəfəsini başa düşmək üçün ən azı ümumi mənada qədim yunanların musiqinin dini və təşkilati əhəmiyyəti haqqında fikirlərini əks etdirən “musiqi etosu” doktrinasını bilmək lazımdır. Platonun və onun məktəbinin musiqiyə baxışlarından qaynaqlanan bu təlim konkret tonallıq, alət, ritm seçimini müəyyən affektlə əlaqələndirir, bununla da musiqiçiləri müəyyən poetik və fəlsəfi vəzifələrlə bağlı müəyyən ifadə vasitələri seçməyə məcbur edirdi. . Altı ədədin və ya bütün qavrayış prosesinin müzakirəsi və əsaslandırılmasının özü məntiqi Avqustinin özünün, daha geniş şəkildə onun vasitəsilə bütün antik dövrdə həssaslıq və rəşadət probleminə münasibətinin effektivliyini əks etdirirdi. Lakin artıq Ellinizm dövrü özü ilə böhran gətirdi, onu insan psixikasının ən dərin hadisələri ilə üzləşdirdi, ellinlərin fikrincə, Şərq "brahmanları və sehrbazları" tərəfindən heç bir şəkildə ağılın köməyi ilə dərk olunmadı. Bütün bunlar gec antik dövrü, xüsusən də Roma İmperiyasında xristianlığın aktiv şəkildə yayılmasından sonra, “əsassızlara” - hisslərə, imanlara, estetikaya müraciət etməyə məcbur etdi.

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**YEDİNCİ SINIF FEN BİLİMLERİ DERS KİTABI “GÜNEŞ SİSTEMİ VE ÖTESİ”
ÜNİTESİNİN ELEŞTİREL DÜŞÜNME STANDARTLARI AÇISINDAN
İNCELENMESİ**

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ÖZET

Eğitim sistemlerinin günümüzde hedeflediği başlıca kazanımlardan biri sorgulayabilen, mantıklı tahmin ve çıkarımlarda bulunabilen, problem çözebilen bireyler yetiştirmektir. Bu hedefe ulaşmak için öğrencilerin eleştirel düşünme becerilerinin gelişmiş olması gerekmektedir. Eleştirel düşünme, düşünceyi analiz etme ve değerlendirme sanatı olarak ifade edilmiştir. Bu becerinin öğrencilere kazandırılması için eğitim öğretim sürecinin kapsadığı her ögenin önemi büyüktür. Bu öğelerden biri, farklı ortamlarda öğrenim gören tüm öğrenciler için sürecin temelini oluşturan ve değişen koşullara rağmen kullanımı her zaman devam eden ders kitaplarıdır. Çalışmada, 2023-2024 yılında Milli Eğitim Bakanlığınca okullarda kullanılmasına karar verilen ortaokul yedinci sınıf Fen Bilimleri ders kitabı ele alınmıştır. Kitapta yer alan “Güneş Sistemi ve Ötesi” ünitesi eleştirel düşünme standartları açısından incelenmiş; “Uzay Araştırmaları” ve “Gök Cisimleri” olmak üzere iki bölümden oluşan ünitenin eleştirel düşünmenin açıklık, doğruluk, önem/alaka, yeterlilik, derinlik/genişlik ve kesinlik standartlarını karşılayıp karşılamadığı araştırılmıştır. Nitel olarak yürütülen çalışmada veriler doküman incelemesi yöntemiyle toplanarak analiz edilmiştir. Kitapta yer alan metinlerin ve görsellerin eleştirel düşünme standartlarına uygunluk durumları örnek alıntılar sunularak açıklanmıştır. Analiz sonucunda yedinci sınıf Fen Bilimleri ders kitabında yer alan “Güneş Sistemi ve Ötesi” ünitesinin eleştirel düşünmenin önem/alaka standardını karşıladığı; açıklık, doğruluk, yeterlik, derinlik/genişlik ve kesinlik standartlarını ise kısmen karşıladığı görülmüştür. Sonuç olarak fen eğitim öğretim sürecinin temel materyali olan Fen Bilimleri ders kitabının hazırlanma aşamasında eleştirel düşünme standartları açısından daha titiz çalışılması gerektiği ortaya konmuştur. Bu bağlamda ders kitabı yazarlarına bazı öneriler sunulmuştur.

Anahtar Sözcükler: Eleştirel Düşünme Standartları, Fen Eğitimi, Ders Kitabı

**EXAMINATION OF THE SEVENTH GRADE SCIENCE TEXTBOOK "SOLAR
SYSTEM AND BEYOND" UNIT IN TERMS OF CRITICAL THINKING
STANDARDS**

ABSTRACT

One of the main goals of education systems today is to raise individuals who can question, make logical predictions and inferences, and solve problems. In order to achieve this goal, students need to have developed critical thinking skills. Critical thinking is defined as the art of analyzing and evaluating thought. In order for students to acquire this skill, every element of the education and training process is of great importance. One of these elements is textbooks, which form the basis of the process for all students learning in different environments and whose use continues despite changing conditions. In this study, the middle school seventh grade Science textbook, which was decided to be used in schools by the Ministry of National Education in 2023-2024, was analyzed. The "Solar System and Beyond" unit in the textbook was analyzed in terms of critical thinking standards; it was investigated whether the unit, which consists of two parts, "Space Exploration" and "Celestial Bodies", meets the standards of critical thinking such as clarity, accuracy, importance/relevance, sufficiency, depth/width and certainty. In this qualitative study, data were collected and analyzed by document analysis method. The suitability of the texts and visuals in the book for critical thinking standards was explained by presenting sample quotations. As a result of the analysis, it was seen that the "Solar System and Beyond" unit in the seventh grade Science textbook met the importance/relevance standard of critical thinking, and partially met the standards of clarity, accuracy, sufficiency, depth/width and certainty. As a result, it has been revealed that the Science textbook, which is the basic material of science education and training process, should be studied more meticulously in terms of critical thinking standards. In this context, some suggestions were presented to the textbook authors.

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Keywords: Critical Thinking Standards, Science Education, Textbook

GİRİŞ

Fen eğitiminin amacı bilimsel okuryazar bireyler yetiştirmektir Bunun için öğrencilerin muhakeme yeteneği, bilimsel düşünme alışkanlıkları ve karar verme becerilerinin geliştirilmesi hedeflenir (MEB, 2018). Bilimsel okuryazarlık gibi, 21. yüzyılın taleplerini karşılayacak nitelikte bireylerin sahip olması gereken bir diğer beceri de eleştirel düşünme becerisidir. Eleştirel düşünme, bilgiyi analiz etme ve değerlendirme sanatı olarak ifade edilmiştir (Duron vd., 2006). Norris (1985), eleştirel düşünmeyi öğretim süreçlerinde bir seçenek olarak değil zorunluluk olarak görmüştür. Bu becerinin öğrencilere kazandırılması

için eğitim öğretim sürecinin kapsadığı her ögenin önemi büyüktür. Bu öğelerden biri, farklı ortamlarda öğrenim gören tüm öğrenciler için sürecin temelini oluşturan ve değişen koşullara rağmen kullanımı her zaman devam eden ders kitaplarıdır.

Ders kitapları öğretim programlarının felsefesini yansıtan önemli araçlardır. Eğitim öğretim ortamlarındaki çeşitlilik ve eşitsizlik düşünüldüğünde ders kitaplarının öğretmen ve öğrencilere konuların mantıksal sırası, yöntem ve etkinlikler için de rehberlik ettiği görülmektedir (Aybek vd., 2014). Bu nedenle günümüz eğitim sistemlerinin öğrencilere kazandırmayı amaçladığı eleştirel düşünme becerisi, ders kitapları için de bir hedef olmalı ve ders kitapları bu doğrultuda hazırlanmalıdır.

Nossich (2012), üst düzey düşünme biçimlerinden olan eleştirel düşünmenin bazı yüksek standartları karşılaması gerektiğini ifade etmiş ve bu standartların, kurduğumuz mantığın eleştirel düşünmeye uygunluğunu ölçtüğümüz filtreler olabileceğini ifade etmiştir. Buna göre açıklık standardı açık, sade ve kolay anlaşılır ifadeler, ayrıntılı açıklamalar, örneklerle somutlaştırma ve görsellerle desteklemeyi içerir. Doğruluk standardı düşüncenin doğru ve mantıklı olmasını, bilginin doğru bir sıra ile verilmesini ve neden-sonuç ilişkilerinin kurulmasını içerir. Önem/alaka standardı önemli noktaların vurgulanmasını ve belirginleştirilmesini, konular arasında bağ olmasını içerir. Yeterlilik standardı bilgilerin ve etkinliklerin yeterli olmasını, konuya pek çok açıdan bakılmasını, zaman bakımından yeterlilik göstermesini içerir. Derinlik/genişlik standardı olayların nedenlerinin ayrıntılı açıklanmasını, problemin altında yatan teoriler, açıklamalar ve karmaşıklıkların dikkate alınmasını içerir. Kesinlik standardı bilgilerin hatasız olmasını, olayların sebeplerinin açıklanmasını, sonuçların kesinliğini içerir.

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ARAŞTIRMA VE BULGULAR

Bu çalışmada 7. sınıf Fen Bilimleri ders kitabında yer alan “Güneş Sistemi ve Ötesi” ünitesinin eleştirel düşünme standartları açısından incelenmesi amaçlanmıştır. Bu doğrultuda aşağıdaki araştırma sorusuna cevap aranmıştır:

2023-2024 eğitim öğretim yılında Milli Eğitim Bakanlığınca okutulmasına karar verilen 7. sınıf Fen Bilimleri ders kitabında yer alan “Güneş Sistemi ve Ötesi” ünitesi eleştirel düşünmenin açıklık, doğruluk, önem/alaka, yeterlilik, derinlik/genişlik ve kesinlik standartlarını karşılamakta mıdır?

Nitel olarak yürütülen çalışmada veriler doküman incelemesi yöntemiyle toplanarak analiz edilmiştir. Kitapta yer alan metinlerin ve görsellerin eleştirel düşünme standartlarına uygunluk durumları örnek alıntılar sunularak açıklanmıştır. Aşağıdaki sırayla ünitenin her eleştirel düşünme standardını karşılayıp karşılamadığına yönelik bulgulara örnekler sunularak yer verilmiştir.

1. Açıklık Standardına İlişkin Bulgular

Ders kitabında üniteye ait metinler incelendiğinde genel olarak yedinci sınıf öğrencilerinin seviyesine uygun bir dil kullanıldığı, kavramların açıklandığı ve bu kavramların somutlaştırılması için örneklerden yararlanıldığı, anlaşılır ifadeler içeren, açıklık standardını karşılayan bölümlerin olduğu görülmüştür. Örneğin “Işık yılı ışığın boşlukta bir yılda aldığı yoldur.” cümlesiyle, kavram net bir şekilde tanımlanmış; “Işığın boşluktaki hızı yaklaşık olarak saniyede 300.000 kilometredir. Buna göre 1 yıl saniyeye çevrilip ışığın saniyedeki hızıyla çarpılırsa; 1 ışık yılı = $365 \times 24 \times 60 \times 60 \times 300.000 = 9.460.800.000.000 \text{ km} \approx 9,5 \text{ trilyon kilometre olarak bulunur.}$ ” cümleleriyle ise kavramı açıklayan bilgiler ayrıntılı bir şekilde ifade edilmiştir. Bu nedenle, verilen cümleler açıklık standardını karşılamaktadır. Uzay araçlarının, gözlemvlerinin, bulutsu şekillerinin, galaksi çeşitlerinin ve yıldız oluşum sürecinin görsellerle desteklenmiş olması (Şekil 1) ve ünite sonunda kavram haritasının verilmesi açıklık standardının karşılanmasına yardımcı olmuştur.



Görsel 1.27 Karanlık bulutsulardan Atbaşı



Görsel 1.28 Salma bulutsulardan Kedipatisi



Görsel 1.3 Uzay istasyonu



Görsel 1.4 Uzay mekiği



Görsel 1.20 Gözlemevi

Şekil 1. Anlatımın görsellerle desteklenmesine dair bazı örnekler

Ünite incelendiğinde, metinlerde geçen bazı cümlelerin ise açıklık standardını karşılamadığı görülmüştür. Örneğin; “Havanın açık ve bulutsuz olduğu bir gecede, gökyüzüne baktığınızda kimi yanıp sönen kimi sabit ışık saçan şekilde görünen bir görüntüyle karşılaşabilirsiniz.” cümlesi net olmayan bir ifade içerdiği ve öğrencilerin okuduklarını kolaylıkla anlamasına engel olduğu için açıklık standardını karşılamamıştır. “Harizmi, yıldızlar kataloğu hazırlamış; Güneş, Ay ve yıldızların yüksekliklerini araştırmıştır. Uluğ Bey, gök bilimi ve matematik alanlarında çalışmış, Semerkant’ta bir medrese ve gözlemevi yaptırmıştır. Ayrıca yaptığı ilk kapsamlı “yıldızlar cetveli” büyük ilgi ve saygı görmüştür.” cümlelerinde geçen “yıldızlar kataloğu” ve “yıldızlar cetveli” kavramları görsellerle desteklenmediği için öğrenciler tarafından net bir şekilde anlaşılammakta, dolayısıyla cümleler açıklık standardını karşılamamaktadır. “Çoğu zaman evrenle aynı gibi kullanılan ancak evrenden farklı anlamı

olan uzay, tüm gök cisimlerinin içinde bulunduğu sonsuz boşluktur.” cümlesinde evren ve uzay kavramları karşılaştırılarak farklı oldukları vurgulanmış, ancak cümlenin devamında evrenin ne olduğu açıklanmadığı için ifade eksik kalmış ve açıklık standardını karşılamamıştır. “Kendiliğinden ısı ve ışık yayan doğal gök cisimleri yıldız olarak adlandırılır. Yıldızlar, merkezlerinde meydana gelen tepkimeler sonucu enerji üreterek çevrelerine ısı ve ışık yayar. Kısaca yıldızlar doğal ısı ve ışık kaynağıdır.” cümleleri peş peşe sıralanmış ve aynı anlamı içeren ifadeler tekrara düşmüştür. Sadelik alt boyutunu içermediği için bu cümleler açıklık standardını karşılamamıştır. “Evrenin oluşumunu açıklamaya çalışan teoriler içinde bilimsel anlayışa en uygun olanı Büyük Patlama ya da Big Bang modelidir. Büyük Patlama terimi genellikle evrenin doğumu olarak adlandırılabilir bu aşamayı anlatmak için kullanılır. Büyük Patlama uzayda bir patlama değil, uzayın genişlemesidir. Bu modele göre evrenin yaklaşık 13,8 milyar yıl önce genişlemeye başlamasıyla oluştu.” cümleleriyle açıklanmaya çalışılan “evrenin oluşumu” olayı, evrenin genişlemesiyle açıklanmış ve “Evren, evrenin genişlemesiyle oluşmuştur.” anlamı taşıdığından açıklık standardını karşılamamıştır.

2. Doğruluk Standardına İlişkin Bulgular

Ders kitabında üniteye ait metinler incelendiğinde genel olarak verilen bilgilerin doğru olduğu, konuya uygun örnekler sunulduğu ve bilgilerin doğru bir sıralama ile verildiği, doğruluk standardını karşılayan bölümlerin olduğu görülmüştür. Örneğin; “Uzay sondasının çok uzaktaki gezegenlere varması yıllar sürer. Amerikan uzay sondası Voyager (Voyacı) ikinci yolculuğuna 1977 yılında başlamıştır. Güneş sisteminin sonuna ulaşması 37 yıl kadar sürmüştür.” ifadesi konuya uygun örnek içerdiğinden; “Kara delik, ışığı bile çeken çok güçlü çekim gücüne sahiptir. Bunlar ışık yaymadığı, aydınlık olmadığı için “kara” olarak nitelendirilmiştir.” ve “Teleskobun bulunduğu yer, alınacak görüntüleri olumsuz etkileyebilecek ışık kaynaklarından uzak olmalıdır. Bu nedenle gözlemevleri kent merkezlerinden uzağa kurulur.” ifadeleri neden-sonuç ilişkisine dayandırıldığından doğruluk standardını karşılamaktadır.

Ünite incelendiğinde, metinlerde geçen bazı cümlelerin doğruluk standardını karşılamadığı görülmüştür. Örneğin; “Burçlar olarak da bilinen takımyıldızların görüntüleri bitkilere, hayvanlara, günlük yaşamda kullanılan eşya ya da varlıklara benzetilir.” cümlesi, burçların da birer takımyıldız olduğu gerçeğini ifade etmeye çalışmakta; ancak, öğrencilerde “Takımyıldızların diğer adı burçlardır.” şeklinde kavram yanılgısı oluşturacak biçimde yanlış bilgi içermektedir. Bu cümle doğruluk standardını karşılamamaktadır. Ayrıca, doğruluk standardına göre bilgiler doğru bir sıralama ile verilmelidir. Ancak “Bir gezegenin çekimiyle onun çevresinde dolanan daha küçük gök cisimlerine doğal uydu denir.”, “Görevlerini tamamlayan uzay araçları Dünya’ya dönerken kütle çekim kuvveti nedeniyle atmosferde çok yüksek hızlara ulaşır.”, “Uzaydaki bulutsu adı verilen gaz ve toz yığınları, kütle çekim kuvvetinin etkisiyle bir araya gelerek sıkışır.” ve “Bir gezegenin çekimiyle onun çevresinde

dolanan daha küçük gök cisimlerine doğal uydu denir.” cümlelerinde geçen kütle çekim kuvveti kavramı henüz öğrencilerin bilmedikleri bir kavram olup, açıklamaları 3. üniteye yer almaktadır. Benzer şekilde “Yıldızlar, merkezlerinde meydana gelen tepkimeler sonucu enerji üreterek çevrelerine ısı ve ışık yayar.” cümlesindeki tepkime kavramı da 4. üniteye yer almakta, doğru bilgi sıralaması yapılmadığı için bu cümleler doğruluk standardını karşılamamaktadır.

3. Önem/Alaka Standardına İlişkin Bulgular

Ders kitabında üniteye ait metinler incelendiğinde genel olarak önem/alaka standardını karşılayan bölümlerin olduğu görülmüştür. Ünite, kapsadığı konu gereği çok sayıda kavram içermektedir. Bu kavramlar bölüm başlarında ayrıca belirtilmiş ve bölüm metinlerinde koyu renkle vurgulanarak ayrıntılı şekilde tanımlanmışlardır (Şekil 2). Örneğin; “*Sabit teleskoplar kullanılarak gökyüzüyle ilgili araştırma ve çalışmaların yapıldığı yerlere **gözlemevi (rasathane)** denir.*”, “***Işık yılı** ışığın boşlukta bir yılda aldığı yoldur.*”, “*Birbirine yakın görünen birden fazla yıldızın oluşturduğu yıldız kümesine **takımyıldız** denir.*” cümlelerinde temel kavramlar vurgulanarak açıklanmış, bu durum cümlelerin önem/alaka standardını karşılamasına yardımcı olmuştur.

ın kullanılması gerekir. Bunun yerine böyle uzaklıkta-
tadır. **Işık yılı** ışığın boşlukta bir yılda aldığı yoldur.

da bir küme oluşturmuş gibi görünür. Birbirine
yakın görünen birden fazla yıldızın oluşturduğu
yıldız kümesine **takımyıldız** denir. Takımyıldızla-

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Şekil 2. Temel kavramların vurgulanmasına dair bazı örnekler

İncelenen metinlerde, konuların günlük hayat bağlantılarının kurulduğu ve örneklendirmelerin bu yönde yapıldığı görülmektedir (Şekil 3). Örneğin uzay araştırmaları konusu, öğrencilerin günlük hayatta kullandıkları ya da aşina oldukları dijital termometre, navigasyon cihazı, bebek maması, alüminyum folyo, optik lens vb. ürünlerle ilişkilendirilerek sunulmuş; bu durum önem/alaka standardının karşılanmasına yardımcı olmuştur.

► **Hafif malzeme**, yapay uydular, ısı ve ışığı iyi ileten yoğunluğu düşük malzemelerden üretilmektedir. Bu malzemeler yiyecek paketi, alüminyum folyo gibi malzemelerin üretiminde de kullanılmaktadır (Görsel 1.8).

► **Mikroçip**, ilk olarak Apollo uzay aracının yön bilgisayarıda kullanılmıştır (Görsel 1.9). Başta bilgisayarlar olmak üzere çok fazla kullanım alanı vardır.

► **Besinleri dondurma**, NASA'nın astronotların yiyeceklerini uzun süre saklamak için geliştirdiği bir yöntemdir.

► **Gözlük camları ve lensler**, astronotların başlıklarında kullanılan teknolojiye dayanarak geliştirilmiştir (Görsel 1.10).

► **Dijital termometreler**, NASA'da kızılötesi teknolojisiyle yapılan, yıldızların sıcaklıklarını ölçen aletlerden yararlanılarak bulunmuştur. Bu araç insanın vücut sıcaklığını ölçmek amacıyla geliştirilmiştir (Görsel 1.11).



Görsel 1.10 Dayanıklı bir lens



Görsel 1.11 Dijital kulak termometresi

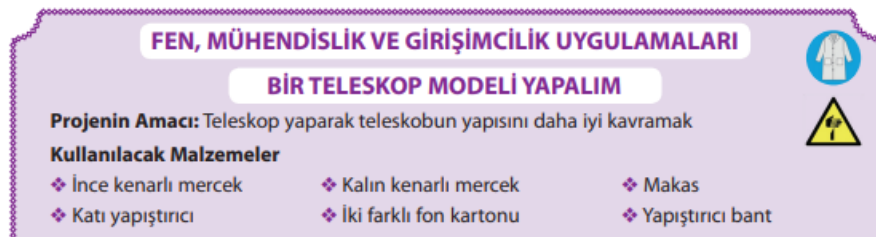
Şekil 3. Günlük hayat bağlantılarına dair bazı örnekler

4. Yeterlilik Standardına İlişkin Bulgular

Ders kitabında üniteye ait metinler incelendiğinde genel olarak verilen bilgilerin yeterli olduğu, konunun fazla etkinlik yapmaya müsait olmayan doğası gereği 1 etkinlik içerdiği, uygun bölümlerde konuya farklı bakış açılarıyla yaklaşıldığı, kısaca yeterlilik standardının karşılandığı görülmüştür. Örneğin uzay teknolojilerinin gelişimi, eski tarihli bilim kurgu romanları ile ilişkilendirilerek ve günümüzde bize sağladığı faydaları ile bağlantı kurularak, konuya farklı açılardan bakış sağlanmıştır (Şekil 4). Uzay araçlarının gelişiminin ilk basamağı olan teleskobun yapımı etkinliği de, yeterlilik standardının karşılanmasına yardımcı olmuştur (Şekil 5).

Fransız bilim kurgu yazarı Jules Verne (Jul Vern) tarafından 1865'te yayımlanan "Ay'a Seyahat" adlı kitabında anlattıklarına o yıllarda bir hayal olarak bakılmıştır. 1898 yılında İngiliz romancı H. G. Wells (Vils) de "Ay'daki İlk İnsanlar" adlı romanında Ay'a seyahat eden iki karakterin maceralarını anlatmıştır. 1927 yılında Almanlar "Uzay Yolculuğu Derneği"ni kurmuştur. Derneğe uzay bilimci ve

Şekil 4. Konuya farklı açılardan bakmaya dair bir örnek



Şekil 5. Konunun etkinlikle desteklenmesine dair bir örnek

Ünite incelendiğinde, metinlerde geçen bazı cümlelerin ise yeterlilik standardını karşılamadığı görülmüştür. Örneğin; "Birçok ülkenin ortak çalışmasıyla yapılmış olan Uluslararası Uzay İstasyonu günümüzde de Uzay istasyonu görevini sürdürmektedir." cümlesi, Uluslararası Uzay İstasyonu'nun hangi ülkeler tarafından yapılmış olduğu bilgisini içermediği için yeterlilik standardını karşılamamaktadır. "Geceleri gökyüzünde görülen gök cisimlerinden bazıları da gezegenlerdir." cümlesinde ve sonrasında, gece gökyüzünde görülen diğer gök cisimlerinin (uydu, gezegen) neler olduğuyla ilgili bilgi verilmediği için bu cümle yeterlilik standardını karşılamamaktadır.

5. Derinlik /Genişlik Standardına İlişkin Bulgular

Ders kitabında üniteye ait metinler incelendiğinde genel olarak, derinlik/genişlik standardını karşılayan bölümlerin olduğu görülmüştür. Örneğin; "İnsanlar, eski çağlardan beri uzayı merak etmiştir. Uzay, tüm gök cisimlerinin içinde bulunduğu sınırsız boşluktur. İnsanlar uzayla ilgili meraklarını gidermek için gözlem yaparken uzay cisimlerinin farkına varmıştır. Ancak uzayı gözlemleyebilmeyi sağlayan teleskobun icadına kadar insanlar, uzay hakkında fazla bilgi sahibi olamamışlardır." ve "Uzay istasyonlarında yer çekimi yoktur. Astronotlar

yer çekimsiz ortamda kaslarının zayıflamaması için vücutlarını çalıştıracak egzersizler yaparlar.” cümlelerinde verilen derinlemesine bilgilerden ve geniş bakış açılarından dolayı derinlik/genişlik standardı karşılanmaktadır.

Ünite incelendiğinde, metinlerde geçen bazı cümlelerin ise derinlik/genişlik standardını karşılamadığı görülmüştür. Örneğin; *“Teleskoplar genellikle geceleri kullanılır.”* cümlesinden sonra teleskopların gündüzleri de kullanılıp kullanılmadığı, kullanılıyorsa ne amaçla kullanıldığına dair ayrıntılı bilgi verilmediğinden; bu cümle derinlik standardını karşılamamaktadır. *“Işık kirliliği, yanlış yerde, yanlış yönde, yanlış zamanda aşırı ışık kullanılması ya da aydınlatma yapılmasıyla oluşur. Bu durum hem insanları ve karanlıkta aktif olan yaras, baykuş gibi hayvanları olumsuz etkiler hem de enerji israfına neden olur.”* cümlelerinde, bahsi geçen canlıların ışık kirliliğinden hangi şekilde olumsuz etkilendiklerine dair derinlemesine bilgi verilmediği için, metnin bu bölümü derinlik/genişlik standardını karşılamamaktadır. *“Tek ya da takım hâlinde bulunan yıldızların böyle görünmelerinin nedeni, büyüklüklerinin ve Dünya’ya olan uzaklıklarının farklı olmasıdır. Bu uzaklık nedeniyle Güneş şu anda yok olsa Dünya’ya gelen ısı ve ışık yaklaşık sekiz dakika sonra kesilir.”* cümlelerinde, Güneş’ten gelen ışığın sekiz dakika sonra kesilecek olmasının nedeni uzaklıkla ilişkilendirilmiş, ancak konu ayrıntılı bir şekilde açıklanmamıştır. Bu nedenle metnin bu bölümü derinlik/genişlik standardını karşılamamaktadır.

6. Kesinlik Standardına İlişkin Bulgular

Ders kitabında üniteye ait metinler incelendiğinde genel olarak hatasız ve kazanım odaklı bilgilerin sunulduğu, kesinlik standardını karşılayan bölümlerin olduğu görülmüştür. Örneğin; “Bir Teleskop Yapalım” etkinliği “F.7.1.1.6. Basit bir teleskop modeli hazırlayarak sunar.” kazanımı ile doğrudan ilişkilidir.

Ünite incelendiğinde, metinlerde geçen bazı cümlelerin ise kesinlik standardını karşılamadığı görülmüştür. Örneğin; *“Ömrünü tamamlayan uydular yörüngelerinde dönmeye devam eder ve uzayda çöp olarak kalıp uzayı kirletir.”* cümlesinde uyduların yörüngelerinde “dolanmaya” devam ettikleri söylenmesi gerekirken “dönmeye” devam ettikleri söylenmiştir. Kullanılan kavramın hatalı olmasından dolayı cümle, kesinlik standardını karşılamamaktadır. *“Bunun için bölgenin uzun dönemli iklim bilgilerine bakılır. Elde edilen ortalama değerler incelenerek olası bölgeler belirlenir.”* cümlesinde “uzun dönemli iklim bilgileri” ve “iklim bilgilerinden elde edilen ortalama değerler”den bahsedilmiştir. Ancak, iklim kavramının tam karşılığı zaten “uzun dönemli hava olaylarının ortalama değerleri” olduğundan, kavram yanlışlığına yol açabilecek bu cümle kesinlik standardını karşılamamaktadır.

SONUÇ VE ÖNERİLER

- Analiz sonucunda yedinci sınıf Fen Bilimleri ders kitabında yer alan “Güneş Sistemi ve Ötesi” ünitesinin eleştirel düşünmenin önem/alaka standardını karşıladığı; açıklık,

doğruluk, yeterlik, derinlik/genişlik ve kesinlik standartlarını ise kısmen karşıladığı görülmüştür.

- Bu doğrultuda, fen eğitim öğretim sürecinin temel materyali olan Fen Bilimleri ders kitabının hazırlanma aşamasında eleştirel düşünme standartları açısından daha titiz çalışılması gerektiği ortaya konmuştur.
- Farklı ünite, kademe ve ders düzeylerindeki ders kitapları eleştirel düşünme standartları açısından incelenebilir.
- Yazarlar ders kitaplarında bilişsel, duyuşsal ve psikomotor becerileri kazandıracak etkinliklerle birlikte, eleştirel düşünme becerilerini geliştirecek konu ve etkinliklere de yer vermelidir.
- Ders kitaplarının eleştirel düşünme standartlarını karşılayacak nitelikte hazırlanabilmesi için konu alanı uzmanları ile birlikte eleştirel düşünme alanında çalışan akademik uzmanlar, öğretim tasarım uzmanı, eğitim psikoloğu ve eğitim teknolojü gibi diğer uzmanlara da kitap hazırlama komisyonunda yer verilmelidir.

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GOAL-ORIENTED EDUCATION LEADERSHIP IN SMALL COUNTRIES

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ABSTRACT

Today's reality is that any modern educational institution that wants to operate competitively and effectively in our country must keep up with the challenges posed by globalization in the field of international education, consider the world-wide standards quality in educational service, and offer creative and innovative teaching content and methods. It is critical for Azerbaijan's educational institutions to reinvent themselves by analyzing their current activities, outcomes, and competitiveness in regional and international educational area, as well as to pursue institutional changes and operational transformations, in other words, re-branding in accordance with their development strategies. The article is discussing what should be done to design and implement an effective management strategy for an educational institution seeking to succeed in the current period and get international recognition. The paper's main point of discussion is developing an educational institution's identity in line with national, regional, and even world-wide standards. This point of view has been explored in the context of secondary and higher education institutions. I argue that, human resources serve as an initial basis for achieving any type of managerial goals. Managers ought to show extra sensitivity in this matter, since choosing an employee who can be an actual asset to the organization is a key decision. The visible peak of the iceberg is education and work experience, however employees' actual assets are their capabilities and character. One of the primary findings reached all over the discussion is that management is strongly dependent on behavioral or particular outcome expectations; therefore doing the right things (gaining effectiveness) and doing the things right (achieving efficiency) are crucial decisions in management.

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Key words: International recognition, Management strategy, Re-branding

I. INTRODUCTION

We live in a quickly changing, worldwide globalized and ICT-driven world. The growing interconnectedness of countries is one of the most notable aspects of the modern world. Azerbaijan, being a South Caucasian country, is part of a globalized world. Azerbaijan is a relatively small country in terms of its land area and population. However, throughout its history, Azerbaijan has differed in terms of the education level of its population, as well as its academics, institutions, and youth. Azerbaijani youth are always interested in new

developments, progressive advancements, and the use of current technology. As a result, the national education system is always striving to stay up-to-date and address current challenges in both international education and ICT developments. Therefore, most education institutions in Azerbaijan, including high education institutes (HEIs) and secondary (primary) schools are intended to modernize and coordinate all of their activities in accordance with international education standards. Personally, I believe that, in order to thrive in today's extremely competitive environment, each educational institution must define its identity in accordance with national, regional, and worldwide challenges. This approach might be described as institutional rebranding. I prefer the phrase "rebranding" due to the fact that each institution has established its own traditions, history, and active or passive position in the national education system throughout time and should now cope with present demands/challenges.

II. RESEARCH AND FINDINGS

A. *The concern (issue):*

The difficulty I saw at most Azerbaijani educational institutions is a lack of a clear road-map for the near and far future, as well as a shortage of necessary human resources. The author of this paper has been working in the education industry for over 13 years. (I used to work at HEI for 6 years, I was a PhD student, and now I work at the secondary state school with the status of a modern lyceum.). Therefore, taking into account the various leadership strategies, management mechanisms, and tools used by a number of education managers I worked with, I argue that, in such a progressive and dynamically developing country as Azerbaijan, modern education institutions must define their own niche opportunities in order to become the leading national institution in their own activity sector. To that aim, modern and progressive education managers must accurately establish their institution's identity in accordance with national, regional, and even worldwide standards, as well as carve out their own road-map and smart strategy, along with action plans for specific short-term and long-term goals.

B. *Discussion:*

Let us look at the proposed theory for modern education managers: How can you properly establish your institution's identity in accordance with national, regional, and even worldwide standards? I think that, in order to overcome the challenges/obstacles of designing and implementing a real, reasonable and goal-oriented approach, the leadership of the education institution must create their own route plan, involving the following aspects: preparing a strategic development plan with achievable milestones for the coming year and 3-5 years ahead and setting behavioral expectations for personnel, system, and stakeholders (beneficiaries) for the stated period at the institution. The key questions here are the

following ones: “What does your institution aim to accomplish by the end of the coming year?” and “What is your target at the end of 5 years starting today?”

For example, as a secondary school principal, you can aim to become a base school for a certain HEI, a leader in robotics education, or the preferred location to learn foreign languages due to the presence of international academic staff members in your team. What should be a manager’s first step in this regard? Human resources serve as an initial basis for achieving any of these goals. Progressive personnel with immense potential who are led by passive management would soon lose enthusiasm for their regular daily tasks. Furthermore, an open-minded and creative manager without a staff with suitable capabilities would fail to achieve any of his impressive goals. All of these roles are interconnected. To start with, set up your SMART (Specific, Measurable, Achievable, Relevant, and Time-Bound) goals, then form a team with the necessary capabilities, and finally develop a strategy to accomplish the defined objectives. At this point, we expose the power of the manager as a major influencer. The manager should be the team’s leader. A leader is someone who can take advantage of the strengths of his or her team members to approach defined objectives, motivate them, and support them to succeed. On the other hand, the leader should also be the team's manager, who plans, organizes, leads, and controls procedures while also deals with interpersonal relationships. In this context, the so-called “soft skills”, also known as 21st century skills, are vital for modern managers. I argue that, the key characteristics of a modern manager are the ability to recognize potential, actual motives, and reasonable stimuli in his or her personnel, as well as the expertise to channel that potential toward defined objectives. Managers ought to show extra sensitivity in this matter, since choosing an employee who can be an actual asset to the organization is a key decision. The visible peak of the iceberg is education and work experience, however employees’ actual assets are their capabilities and character. Initiative, flexibility, motivation, dedication, and persistence may all be important characteristics of a good and decent employee. So, this can serve as an excellent consideration for secondary schools to educate such graduates, who will be a valuable asset to themselves in the next two decades. Not surprisingly that this approach was declared by Martin Luther King, Jr. even in 1947: “We must remember that intelligence is not enough. Intelligence plus character – that is the goal of true education.” (King, 1947) Nowadays, the important and most difficult duty for education is to define an appropriate balance between modernization and ongoing creative destruction processes that occur as the results of a technological growth, which causes social connection gaps. Education cannot disregard current trends, moreover, education has the ability to shape the nation's future. The solution to the disparity between knowledge economy developments and personnel with adequate competencies may lie in creating desired and long-lasting education with appropriate learning and teaching environments; and teaching children values such as always learning, always growing, and always experimenting, gaining technical (hard) skills, and improving human “soft skills”. In this sense, the solutions to current education problems such as “What should we teach?” and, more significantly, “How should we teach?” may be found in STEAM

curriculum and teaching approaches that combine scientific and humanistic components. The expected outcomes of modern education are enthusiastic learners and future innovators with a strong passion for learning and analytical thinking for problem solving applied to real life using philosophical and ethical abilities. In other words, it is crucial to expose the intellectual and practical character of individuals, as education should teach individuals to define and focus on desirable objectives, because intellectuals with wrong morals are a threat to society. Each country has its own set of preferences and obstacles in defining its education policy, and each national institution has multiple successful role models. However, education institutions in each country should be extremely careful in this regard: education systems develop specialists, future generations, and, more importantly for the nation, education shapes character and personal traits, defining citizenship, humanity, empathy, future parents, and so on. To summarize, it is crucial to educate children, students, and learners how and where to apply the knowledge they acquire throughout their lives. It is critical to adapt what we learn to social situations, or to transfer our “hard” skills to “soft” skills in our daily lives, education, job, etc. We may claim that, as computers (Artificial Intelligence) behave more like humans, the social sciences and humanities, as well as the development and management of AI solutions (critical thinking, philosophical and ethics-based skills), will become increasingly important for the knowledge economy and all kinds of businesses. Within the interdisciplinarity and transdisciplinarity of STEAM, instructors and students should handle the learning process jointly.

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In the case of national HEIs, in my view, the most painful shortcomings for national HEIs is a lack of circumstances for HEIs to become research institutions and build proper relationships with the science and industry sectors. Getting familiar with current global research trends and improving the research profile of local academic-research professionals will play a crucial role in developing national pedagogical and managerial professionals. There are multiple international higher education models that are well-known for their positive outcomes, effectiveness, and efficiency. Globalization, in addition to ICT facilities generating new ideas on a regular basis, and different partnership models are offering multiple opportunities for developing countries to benefit from the best international experiences. The Industrial Revolution 4.0 presents new challenges for all countries, no matter how large or small they are, and all local societies must become more responsive to current needs. These developments present extra challenges for Azerbaijani HEIs, pushing them to adjust their vision and action plans. Personally, I think that, at national HEIs in Azerbaijan traditional educational attitudes should be replaced with innovative learning and research methodologies, as well as new multidisciplinary approaches, to accomplish the goal of developing qualified individuals with relevant competences. Valehov & Streitwieser addressed this point as follows: “The role of universities in today’s economies is largely assessed by knowledge-based capital formation, such as Research & Development (R&D) data, software, and patents.” (Valehov and Streitwieser, 2022). So, the main focus of national HEIs should be the effective development of intellectual capabilities; also, a new

management style is required to support components of national university's competitiveness. Open-minded and proactive management will take advantage of opportunities and benefit from international experiences, as opposed to a passive leadership style, which acts more like a decision-taker rather than the desirable one of a decision-maker.

Another discussion point in this paper is that as a manager, you should clearly define your management philosophy. For me, management is about setting behavioral expectations for the employees you manage, the system you built, and the stakeholders (beneficiaries) you identified for your organization. Let us take a closer look at the given points. After identifying your aim, you should evaluate (analyze) your present resources (personnel potential, financial prospects, information resources, etc.). If you lack resources that will assist you accomplish your ultimate goals, you should either provide appropriate resources or adjust your goals to more realistic ones based on your true capabilities. Next, to be competitive, it would be beneficial to utilize a comprehensive strategy using Total Quality Leadership techniques. (Martin and Thawabieh, 2018). You should strive for quality improvements in structure, procedures, and resources while tackling 4.0 revolution transformation difficulties and attempting to cover present gaps within the system. The next important point for managers is to expose the social, economic, marketing, and pedagogical elements of operating educational institutions. To that aim, it is critical to specify the advantages for all stakeholders or beneficiaries of the process, including internal stakeholders (students, leadership, academic staff, and parents) and outward beneficiaries (the community and other educational institutions). Modern institutions must provide an effective learning environment for students, a teaching and collaborating environment for faculty and staff, a creative and inventive environment for leadership, and a customer-satisfaction environment for parents. The assessment and analysis of the institution's quality management system is crucial for successful leadership, strategic quality planning, activity management (structure, policy, personnel), and primary tool mechanisms (content, new educational programs, etc.).

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III. CONCLUSION

Conclusion 1: It is admirable to create some perspective ambitions for national educational institutions, but it is also critical to pick reasonable, practical, and attainable objectives. For example, if you do not have enough staff members with relative skill in robotics, it is pointless to try to make up a fairy tale about how your institution can compete in this area. Okay, you should start with something, and that "something" is nothing else than competent (skilled) employees. If you continue to make the same mistakes, you cannot expect different outcomes. Furthermore, if you are a HEI and want to develop, you must regularly review your educational programs, academic staff credentials, new challenges, and up-to-date trends in your activity profile.

Conclusion 2: Management relies heavily on behavioral or specific outcome expectations. You invest in someone or something, set some circumstances, and then wait for improvements and better outcomes than you have previously attained. Doing the right things (gaining effectiveness) and doing the things right (achieving efficiency) are critical here.

Future practical implications of this paper: Networks of HEIs and secondary schools, the exchange of best practices within collaborative structures at both the local and regional levels, curriculum improvements, and modern technology transfers among institutions may be the main practical implications and further theoretical discussions of this topic.

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CLASSIFICATION OF SPORTS FACILITIES AND REQUIREMENTS FOR SPORTS FACILITIES

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Abstract

Sports facilities are built according to certain construction rules. It regulates the dimensions of objects developed and approved within the framework of legislative norms, and the use of materials for covering. All sports complexes are dedicated to one sport according to their performance (specialized hall, one-bath swimming pool, football, rugby, field hockey, baseball fields, sports fields, shooting sports, archery, athletics tracks, shooting bars, bicycle tracks, riding stables, etc.) is a complex sports facility consisting of individual and several sports bases or an area located in a sports building (stadiums, sports palace, multi-hall sports complex and similar sports facilities, etc.).

In turn, sports facilities are divided into open and covered bases without a cover. Service personnel are placed in auxiliary buildings. His task is to take care of the sports facility and implement its provision. Such facilities should be located close to the main zone and building to facilitate the work of the attendants. Physical education and sports facilities are divided into departments according to their functional purpose.

In the current situation, depending on the competition in any sport, it can be classified into different groups.

However, outdoor and indoor sports facilities can be used for different purposes. They have not only one, but several sports competitions. Objects in the second case are considered universal. They are bases where it is possible to exchange several separate units or equipment located in one area. It is necessary to use uniform classification and terms in order to achieve the identification of the names of sports complexes, to put them in one picture.

Keywords: sports facilities, classification, requirements

INTRODUCTION

There are different types of sports equipment. First, they are divided into main, auxiliary, as well as places for equipment and spectators. The leading part of any sports equipment is its main object. Its purpose is to organize the competition and training process.

Such sports facilities are built according to certain construction rules. It regulates the dimensions of objects developed and approved within the framework of legislative norms, and the use of materials for covering. All sports complexes are dedicated to one sport according to their performance (specialized hall, one-bath swimming pool, football, rugby, field hockey, baseball fields, sports fields, shooting sports, archery, athletics tracks, shooting

bars, bicycle tracks , riding stables, etc.) is a complex sports facility consisting of individual and several sports bases or an area located in a sports building (stadiums, sports palace, multi-hall sports complex and similar sports facilities, etc.).

It refers to the general system elements that are specific to the existing construction norms and the rules of any sports facilities and serve the life of the residents of the settlement of the area. There is also a certain classification of such objects. They can be divided as follows:

- open and covered facilities;
- summer and winter installations;
- individual and complex devices.

Sports facilities are distinguished by these types according to their main purpose:

- educational facilities (without audience space);
- exhibition facilities (with a place for the audience);
- sports and health facilities;
- children's sports facilities.

Sports facilities are divided into the following groups according to the structure of settlements:

- microdistrict facilities
- district facilities
- city facilities
- republic facilities.

In turn, sports facilities are divided into open and covered bases without a cover. Service personnel are placed in auxiliary buildings. His task is to take care of the sports facility and implement its provision. Such facilities should be located close to the main zone and building to facilitate the work of the attendants. Physical education and sports facilities are divided into departments according to their functional purpose.

METHOD

In the current situation, depending on the competition in any sport, it can be classified into different groups.

However, outdoor and indoor sports facilities can be used for different purposes. They have not only one, but several sports competitions. Objects in the second case are considered universal. They are bases where it is possible to exchange several separate units or equipment

located in one area. It is necessary to use uniform classification and terms in order to achieve the identification of the names of sports complexes, to put them in one picture.

The sports complex is an open and covered type facility that allows holding competitions in various types of sports, teaching and training processes, health and physical education, and fun sports.

The document defining the characteristics and condition of the sports equipment is its passport. In the passport:

- exact address of the facility, commissioning date, subordination, price and brief description of engineering services;
- information about the main structure and buildings of the facility, dimensions, passage capacity, lighting;
- about auxiliary devices;
- information about the devices intended for the audience is provided.

Sports competitions, Olympic Games, trainings, sports events held among the population are events that continue throughout the year. Most of these activities require indoor facilities. Therefore, more and more indoor sports facilities with various architectural, artistic and planning solutions are being built.

Indoor sports facilities are facilities with one or more gyms and a complex of auxiliary rooms. A one-hall sports building usually consists of a large hall and auxiliary rooms. Multi-hall facilities consist of halls of different sizes, one or more floors. Indoor sports facilities are divided into gymnasiums and enclosures, indoor tennis courts, arenas, indoor swimming pools, sports palaces and indoor stadiums.

Gyms are specialized, i.e. designed for one type of sport and multi-purpose.

Sports buildings are mostly designed for three or four halls, which allows training and competition in several sports at the same time.

Indoor tennis court with main hall and at least 9 x 12 m. includes sizeable exercise rooms.

Arenas are facilities designed for training camps and competitions in athletics, equestrian and football sports.

Indoor stadiums are distinguished by a large gymnasium, a sports arena and permanent spectator stands. Indoor stadiums are universal facilities used for sports and entertainment. Indoor stadiums are also called sports palaces.

Covered swimming pools - a pool is a facility consisting of one or more baths, auxiliary rooms, devices necessary for technical operation.

Outdoor sports facilities are facilities where competitions and training are held outdoors. These include playgrounds, running fields (athletics, speed skating) and tennis courts.

Sports facilities of this type are used by all age and social groups of the population: from completely healthy people to disabled people, from professional athletes to recreational users. Outdoor sports facilities are divided into summer and winter facilities according to the season. Summer facilities include: athletics, football, basketball, volleyball, tennis courts and hippodromes. Winter facilities include natural and artificial ice fields, ski tracks, ski jumping fields, etc. includes.

The structure of a sports facility includes: main facility; auxiliary buildings and facilities; places for spectators.

The main unit is the main part of the sports equipment intended for sports events and competitions. At present, several classifications of the main sports facilities have been accepted: 1) indoor and outdoor sports facilities according to the characteristics of the facility; 2) individual and complex sports facilities due to the provision of sports facilities with sports fields and equipment; 3) For training, exercises and competitions according to their directions.

If the dimensions of those buildings comply with the requirements and rules of construction norms, they are classified as sports facilities.

According to their purpose, sports facilities are divided into fun sports (demonstrated), as well as teaching-exercise and health-physical training (facilities intended for active recreation of the population).

Sports-spectacle facilities are those facilities where there are special seats for spectators, tribunes or rows of seats that provide a normal view (at least 500 indoors and more than 1500 outdoors). They include stadiums, sports halls, universal pitches and sports facilities with stands, benches, chairs and standing areas.

For flat surfaces - sports fields, ski tracks, mountain ski tracks, etc. belongs to

Auxiliary facilities are designed to ensure the operation of the main sports facility. These include: domestic, technical, administrative and office, as well as referees and places to get information.

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RECOMMENDATIONS

Trainers can be for individual or collective use. Currently, the purpose, structure, principle of operation, form of training and control, work logic, etc. of a number of technical devices in sports. differs with

The creation of simulators that allow learning movement techniques in a number of sports goes back to the time of the first modern Olympics. In the future, these trainers have gradually become more complex and improved. Especially since the 60s of the 20th century, this process has become intensive.

Trainers can be divided into two types: endurance trainers and strength trainers. Endurance trainers are designed to warm up the body before exercise, strengthen the cardiovascular system and burn fat. Strength training machines are designed to increase muscle mass and maximum strength.

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**TEKRARLAYAN İMPLANTASYON BAŞARISIZLIĞI TANISI KONULAN
KADINLARDA SEKRETUVAR FAZ ENDOMETRİYUMDA MECA-79, α 4 β 1
İNTEGRİN VE MUC-2 EKSPRESYONLARININ İMMÜNOHİSTOKİMYASAL
OLARAK İNCELENMESİ**

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ÖZET

İmplantasyonun başarılı olabilmesi endometriyum ve blastokistin karşılıklı uyumlu etkileşimine bağlıdır. Tekrarlayan implantasyon başarısızlığı (TİB) 40 yaş altı kadınlarda en az üç *in vitro* fertilizasyon (IVF) döngüsünde taze veya dondurulmuş yüksek kaliteli embriyo transferi sonrası klinik olarak gebelik elde edilememesi olarak tanımlanmaktadır. Son yıllarda yapılan çalışmalar TİB nedenleri arasında blastokist ve maternal dokunun karşılıklı bozulmuş iletişiminden bahsetmektedir. TİB öyküsü olan kadınlarda IVF tedavisinde iyi kalite embriyo transferine rağmen gebelik elde edilememesi endometriyal faktörleri ön plana çıkarmaktadır. İmplantasyon penceresi olarak adlandırılan ve blastokistin kabul edildiği zaman dilimi olarak bilinen bu dönemde endometriyumda bulunan ve implantasyonda etkili olabileceği düşünülen bazı moleküller yer almaktadır. Bu moleküllerin varlığı ve yoğunluğunun karşılaştırılması ile ilgili birçok çalışma bulunmasına rağmen literatürde TİB olan kadınların endometriyumlarında α 4 β 1 integrin, MUC-2 ve MECA-79 gibi önemli moleküllerin immünohistokimyasal olarak araştırıldığı karşılaştırmalı bir çalışmaya rastlanmamıştır. Bu çalışmada amaç, implantasyonda rol oynadığını düşündüğümüz adezyon moleküllerinin kontrol grubu ve TİB olan hastalarda karşılıklı immünohistokimyasal ve histolojik olarak değerlendirilmesidir. Bu nedenle Çukurova Üniversitesi Tıp Fakültesi Balcalı Hastanesi Kadın Doğum Polikliniği'ne başvuran TİB tanısı konulmuş 21 hastadan ve daha önce gebelik öyküsü olan 21 kişiden menstrüel siklusun 19-21. günleri arasında endometriyal biyopsi örnekleri alınmıştır. Alınan biyopsi materyallerinin bir kısmı ışık mikroskopik, bir kısmı da elektron mikroskopik analizler için hazırlanmıştır. Işık mikroskopik inceleme yapılan dokulara Hematoksilen & Eozin, immünohistokimyasal inceleme yapılan dokulara anti- α 4 β 1 integrin, anti-MUC-2 ve anti-MECA-79 antikorları uygulanmıştır. Ayrıca serum FSH, LH, E2 ve TSH değerlerinin incelenmesi için tüm kadınlardan menstrüel siklusun 2. veya 3. gününde kan örnekleri alınmıştır. Serum FSH, LH ve E2 değerlerinin gruplar arasında anlamlı bir fark göstermediği ancak TSH'nin TİB grubunda referans değer aralığında olmasına rağmen anlamlı olarak yüksek çıktığı gözlenmiştir. Hormon düzeylerinin gruplar arasında anlamlı bir fark

göstermemesine rağmen endometriyumda bazı yapısal farklılıklar gözlenmiştir. İnfertil kadınlarda endometriyum yüzey ve bez epitelinde mikrovilluslu hücrelerin yaygın olduğu, pinopodlu hücre sayısının oldukça azaldığı, pinopod gelişiminin yetersiz olduğu gözlenirken, stromada kontrol grubuna kıyasla önemli fark görülmedi. Yüzey epitelinde integrin ve MUC-2'nin artan ekspresyonuna karşılık MECA-79 ifadesinde azalma izlenirken bez epitelinde integrin ve MECA-79 ekspresyonunun azaldığı, MUC-2 ekspresyonunun arttığı gözlemlendi. Bütün bu sonuçlar birlikte değerlendirildiğinde; tekrarlayan implantasyon başarısızlığı tanısı konulan kadınlarda endometriyal reseptivite döneminde görülen yapısal ve moleküler farklılıkların blastokistin endometriyuma tutunmasını engelleyerek infertiliteye sebep olabileceği düşünüldü.

Anahtar Kelimeler: Tekrarlayan İmplantasyon Başarısızlığı, İmmünohistokimya, MECA-79, $\alpha 4\beta 1$, MUC-2

**IMMUNOHISTOCHEMICAL EXAMINATION OF MECA-79, $\alpha 4\beta 1$
INTEGRIN AND MUC-2 EXPRESSIONS IN THE SECRETORY PHASE
ENDOMETRIUM OF WOMEN DIAGNOSED WITH REPEATED IMPLANTATION
FAILURE**

ABSTRACT

The success of implantation depends on the mutually harmonious interaction of the endometrium and blastocyst. Recurrent implantation failure (RIF) is defined as the clinical inability to achieve pregnancy after fresh or frozen high-quality embryo transfer in at least three in vitro fertilization (IVF) cycles in women under 40 years of age. Studies conducted in recent years mention impaired mutual communication of blastocyst and maternal tissue among the causes of RIF. Failure to achieve pregnancy despite good quality embryo transfer in IVF treatment in women with a history of RIF highlights endometrial factors. During this period, called the implantation window and the time period in which the blastocyst is accepted, there are some molecules in the endometrium that are thought to be effective in implantation. Although there are many studies comparing the presence and density of these molecules, no comparative study has been found in the literature in which important molecules such as $\alpha 4\beta 1$ integrin, MUC-2 and MECA-79 were investigated immunohistochemically in the endometrium of women with RIF. The aim of this study is to evaluate the adhesion molecules that we think play a role in implantation, immunohistochemically and histologically, in the control group and patients with RIF. For this reason, 21 patients diagnosed with RIF who applied to Çukurova University Faculty of Medicine Balcalı Hospital Obstetrics and Gynecology Polyclinic and 21 people with a previous pregnancy history were examined in the 19 th-21st menstrual cycle. Endometrial biopsy samples were taken between days. Some of the biopsy materials taken were prepared for light microscopic analysis and some were prepared for electron microscopic analysis. Hematoxylin and Eosin were applied to the tissues subjected to light microscopic examination, and anti- $\alpha 4\beta 1$ integrin, anti-MUC-2 and anti-MECA-79 antibodies were applied to the tissues subjected to immunohistochemical

examination. In addition, blood samples were taken from all women on the 2nd or 3rd day of the menstrual cycle to examine serum FSH, LH, E2 and TSH values. It was observed that serum FSH, LH and E2 values did not show a significant difference between the groups, but TSH was significantly higher in the TIB group, although it was within the reference value range. Although serum FSH, LH and E2 levels were not significantly different between the two groups, some structural differences were observed in the endometrium. It was observed that microvilli cells were common in the endometrial surface and gland epithelium in infertile women, the number of pinopod cells was significantly reduced, and pinopod development was inefficient compared to the control group. No significant differences were seen in the stroma compared to the control group. It was observed that integrin and MUC-2 increased in the surface epithelium, whereas MECA-79 expression decreased. Integrin and MECA-79 expression decreased and MUC-2 expression increased in the gland epithelium. When all these results are evaluated together; It was thought that structural and molecular differences observed during the endometrial receptivity period in women diagnosed with recurrent implantation failure may cause infertility by preventing the blastocyst from adhering to the endometrium.

Keywords: Recurrent implantation failure, immunohistochemistry, MECA-79, $\alpha 4\beta 1$, MUC-2

FETAL GROWTH RESTRICTION

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Key words: pregnancy, fetal, death, growth restriction.

Fetal growth restriction (FGR) is a complication of pregnancy, as a result of which a lag in growth, fetal weight and other fetometric indicators is observed from the average normative for a specific period of pregnancy. There are three degrees of severity of FGR.

-I - lag in fetometric indicators by 2 weeks.

-II - lag in fetometric indicators by 3–4 weeks.

-III - lag in fetometric indicators by 4 weeks or more.

There are many trigger factors for the development of placental insufficiency, leading to FGR. These can be placental (defects of the umbilical cord and placenta), environmental (unfavorable state of the environment, work in hazardous industries, etc.) and hereditary (gene and chromosomal disorders, congenital malformations). An extremely important aspect is the state of the mother's body before conception: with various diseases and deterioration of the woman's health, the formation of the embryo can occur incorrectly, with disruptions in cellular and tissue processes, which can ultimately cause FGR and even fetal death.

Risk factors for FGR - Mother's age is 40 years or more, bad habits (smoking, drinking alcohol and drugs), FGR in mother or father, previous pregnancies with FGR (risk of recurrence - 25%), pregnancy with a history of stillbirth, severe preeclampsia, chronic arterial hypertension, diabetes mellitus with vascular complications, kidney and liver failure, iron-deficiency anemia, obesity, sexually transmitted infections, gynecological diseases (endometritis and other infectious and inflammatory diseases, PCOS, benign uterine tumors), previous surgical abortion.

FGR is not only low weight and height; placental insufficiency is fraught with serious complications for the fetus and newborn. It is known that the mortality rate of full-term children born with growth retardation is 3–8 times higher than that of normal weight children, and ranks second in the structure of perinatal losses after prematurity. In a third of children born with low weight and height, deviations in physical development persist up to 1 year. Children with growth retardation are at risk for damage to the central nervous system, and the number of infants with severe psychoneurological disorders can reach 12–19%. They often experience adaptation failures and weakened immunity, which means they are susceptible to

colds and infectious-inflammatory diseases. In most cases, FGR develops in the early stages of pregnancy, but it is most often diagnosed only in the 2nd–3rd trimesters, when the unfavorable process has begun and therapeutic and diagnostic measures will no longer have an effect. In modern medicine there are no drugs that selectively improve uteroplacental or placental-fetal blood flow. It is almost impossible to cure FGR or at least reduce the severity of the disorder after 22 weeks of pregnancy. The only way to prevent fetal death is timely delivery. However, do not panic: specialists make this decision in order to save the child's life and preserve his health. If early delivery is inevitable (especially if the pregnancy is up to 34 weeks and the fetal weight is less than 2000 g), doctors will prepare the baby for birth and carry out all the necessary rehabilitation measures.

PERIPHERAL ARTERIAL DISEASE

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Key words: arterial diseases, arterial system, angiography, digital.

Peripheral arterial disease is a chronic and progressive clinical problem that is exacerbated by the growing elderly population in developed countries. Because lower extremity arterial disease is multifocal, it is important to know the extent of the disease when planning treatment. According to the recommendations of the Transatlantic Intersocietal Consensus, the most important criteria for planning surgical and endovascular treatment are the localization of the plaque and the extent of its spread. Therefore, the entire arterial system of the lower extremities should be assessed as a whole.

Digital subtraction angiography, while having such advantages as high temporal and spatial visualization, is an invasive, expensive method with a high risk of complications and radiation exposure. Due to these disadvantages, alternative imaging modalities, DSA (digital subtraction angiography), have been favored in recent years. In addition to being a noninvasive, low-cost, and rapid imaging modality for assessing vascular structures, multislice computed tomography angiography has a lower radiation dose and the amount of contrast material used during the study compared with digital subtraction angiography. In addition, digital subtraction angiography has been selected as an alternative modality due to its support of Multi Planar Reformat software, which provides detailed assessment of the entire vascular tree, as well as three-dimensional volumetric imaging to reliably evaluate mural calcifications and stent grafts.

A study by Rubin et al assessing blood flow in the lower extremities using multislice computed tomographic angiography, digital subtraction angiography, and CT angiography, calculated absorbed radiation doses that were 3.9 times lower than the whole-body radiation dose obtained from CT -angiography. The fact that digital subtraction angiography produces two-dimensional images makes the assessment of narrowing due to superposition difficult. However, with the multiplanar imaging provided by CT angiography, the limitations associated with superposition can be avoided. Although it is not possible to visualize mural thrombus in the arterial wall using the older type of angiography, it can be visualized with CT angiography. from the moment when a minimal narrowing begins to form in the hole. Axial slices have been shown to be the most appropriate slice for the evaluation of mural thrombus.

Based on all these data, the main method for diagnosing patients with peripheral arteries is CT angiography, which is considered an integral part of radiological practice in the evaluation of patients with peripheral arteries topic of our research.

GENETIC BASIS OF HORMONE REGULATION AND PHYSIOLOGICAL HOMEOSTASIS

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Abstract

For an organism to operate correctly and survive, physiological homeostasis must be maintained. Hormones are important mediators that control many physiological functions, including as growth, metabolism, reproduction, and stress response. An extensive examination of the genetic foundations of hormone control and their vital function in preserving physiological balance is given in this manuscript. In order to clarify how genetic variants affect hormone synthesis, signaling pathways, feedback mechanisms, and their consequences in health and disease, it analyzes the complex relationship between genes and hormones.

Introduction

Hormones are signaling molecules that are created by various tissues and endocrine glands. They are essential for regulating bodily physiological functions. A key component of preserving homeostasis is the genetic control of hormone synthesis, signaling, and feedback systems. Understanding the genetic basis of hormone regulation provides insights into the complexity of physiological processes and the mechanisms underlying health and disease.

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Genetic Regulation of Hormone Synthesis

The synthesis of hormones is tightly regulated at the genetic level. Genes encoding enzymes and proteins involved in hormone biosynthesis are subject to complex transcriptional regulation. Specific transcription factors bind to regulatory regions of hormone genes, modulating their expression in response to various stimuli. Genetic mutations affecting these regulatory elements can disrupt hormone synthesis, leading to imbalances and associated disorders.

Hormone Signaling Pathways

Hormone signaling pathways are orchestrated by a series of molecular events initiated by hormone binding to specific receptors on target cells. The genetic makeup of these receptors, as well as downstream signaling molecules, influences the cellular response to hormones. Polymorphisms in receptor genes can alter receptor structure or function, affecting hormone sensitivity and responsiveness. Genetic variations in signaling molecules may also impact the efficiency of intracellular signaling cascades, leading to aberrant physiological responses.

Epigenetic Regulation of Hormone Action

Epigenetic mechanisms, including DNA methylation, histone modifications, and non-coding RNAs, exert regulatory control over hormone action. These mechanisms modulate gene expression patterns without altering the underlying DNA sequence, thereby influencing hormone responsiveness. Epigenetic modifications can dynamically regulate hormone receptor expression, chromatin accessibility, and transcriptional activity, shaping the cellular response to hormonal stimuli. Dysregulation of epigenetic processes may contribute to hormone-related disorders and metabolic diseases.

Genetic Influence on Hormone Feedback Mechanisms

Reward systems are essential for preserving hormone levels within specific physiological parameters. Hormone synthesis and breakdown can be unbalanced by genetic differences in feedback loop components, such as hormone receptors, regulatory proteins, or target tissues. Changes in feedback regulation can lead to hormonal imbalances, which can cause metabolic problems, endocrine illnesses, or anomalies in reproduction. Diagnosing and treating illnesses related to hormones requires an understanding of the genetic drivers of hormonal feedback pathways.

Hormonal Imbalance and Disease

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Genetic predisposition contributes significantly to the development of hormone-related diseases and endocrine disorders. Common conditions, such as diabetes, thyroid disorders, adrenal insufficiency, and polycystic ovary syndrome, exhibit complex genetic architectures involving multiple susceptibility loci. Genome-wide association studies have identified genetic variants associated with increased disease risk or altered hormone metabolism. Integrating genetic information with clinical data enables personalized risk assessment, early detection, and targeted interventions for hormone-related diseases.

Future Perspectives

Advancements in genetic technologies, including next-generation sequencing, genome editing, and single-cell transcriptomics, offer unprecedented opportunities to unravel the genetic basis of hormone regulation. Precision medicine approaches aim to tailor therapeutic interventions based on individual genetic profiles, optimizing treatment efficacy and minimizing adverse effects. Targeting specific genetic pathways implicated in hormone dysregulation holds promise for developing novel therapeutics and preventive strategies for hormone-related diseases.

Conclusion

There are significant implications for human health and disease from the dynamic and varied field of research on the genetic basis of hormone control. Researchers can discover new

treatment targets, improve tailored approaches to hormone-related diseases, and learn more about the etiology of endocrine disorders by clarifying the genetic pathways underpinning hormone activity. The secret to maximizing the benefits of precision medicine in hormone therapy and enhancing patient outcomes is to combine genetic data with clinical observations.

RELATIONSHIPS IN VIRGINIA WOOLF'S AND GRAHAM SWIFT'S WORKS

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Abstract

The purpose of the present paper is to present the way that relationships are seen in the literary works of Virginia Woolf and Graham Swift. We notice the same troubled relationships in the works of both authors. However, we could claim that the main difference is that Woolf's life seems to resonate with the unhappy relationships in her fiction, while Swift's depictions of problematic relationships do not have anything to do with his personal life. He claims that he has had a happy childhood, free from any trauma, and that he is not trying to come to terms with any tragic happening in his own life in his fiction. In the meantime, we notice how unhappy families and distant couple relationships are a frequently encountered aspect in the fictional works of both authors. We see, however, how Swift questions the biographic approach in literary criticism and, indeed, nowadays this type of approach is replaced by a psychoanalytic one. We have doubts whether the life of the author has anything to do with the way their fictional universe is portrayed. We can see how imagination can play a fundamental role, to the point where biography has no connection with the work of an author at all.

Keywords: Modernism, Postmodernism, Imagination, Fiction, Biography

**AN EXAMINATION OF YOUNG ADULTS' ATTITUDES TOWARDS MENTAL
HEALTH ISSUES IN ASSAM**

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Abstract

Mental health challenges are the broad range of mental health conditions that disturb one's mood, thoughts, behavior, personality, social interactions and general day-to-day functioning of a person. The mental disorders do not arise as a consequence of a single cause but can be on account of a combination of biological causes, for instance, genetics, and psychological and environmental factors such as deprivation and trauma, social setback and isolation, or poor family environment. There are considerably undesirable societal attitudes against persons who suffer from a mental health condition or disorder. The current paper is quantitative research where the researcher uses descriptive method of study to assess if the young adults have a positive or negative attitude or perspective towards mental disorders. It also aims to determine if there is any significant difference in the means of attitude regarding mental disorders with respect to gender and also to socioeconomic background of the participants. Primary data is gathered from a total sample of 200 participants (100 males and 100 females) residing in the state of Assam, taking the age range as 18-29 years. The researcher utilizes purposive sampling for selection of participants and collects the required data using.

Attitudes Towards Mental Health Problems (ATMHP) scale that is distributed among the participants. Analysis of data is done by means of descriptive and parametric statistics. The researcher tests the hypotheses using z-test to compare the attitudes of young male and female adults regarding mental health problems, and also One-Way ANOVA for the

calculation of whether there is any significant difference of ATMHP scores in the levels of socioeconomic status of the young adults. Results indicate a negative attitude of participants about mental problems. It also indicates some significant differences in the mean attitudes of young male adults and young female adults. Moreover, significant differences of attitudes concerning mental disorders is found in the socio-economic status of the young adults.

Keywords: Attitude, gender, mental illness, socioeconomic status, stigma

**DESIGN AND ANALYSIS OF 4 PISTON INTERNAL COMBUSTION ENGINE
BLOCK**

4 PİSTONLU İÇTEN YANMALI MOTOR BLOĞU TASARIM VE ANALİZİ

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ABSTRACT

Introduction and Purpose: This study extensively examines the design and analysis of a 4-cylinder gasoline engine's block, encompassing crucial aspects such as material selection and intricate calculations. In the automotive realm, engine blocks typically rely on aluminum alloys and cast iron, with gray cast iron, A319, and A356 aluminum alloys emerging as favored options. While cast iron boasts commendable strength and hardness attributes, its weight must be meticulously considered, thus rendering gray cast iron as the preferred material. Critical design parameters, including cylinder diameter (D: 84.48mm) and accepted maximum pressure (Pmax: 7030Kpa), were meticulously specified. Employing the SOLIDWORKS program facilitated the meticulous design and technical drawing of the engine block, with parameters such as crank length, crank radius, connecting rod length, piston diameter, and piston length being meticulously defined. Subsequently, the ANSYS program was instrumental in conducting the block's analysis, utilizing a 2mm mesh size and adopting the "program controlled" element type, culminating in a comprehensive analysis comprising 1,827,315 nodes and 1,095,933 elements. Noteworthy boundary conditions entailed fixing the bottom of the engine block while applying specific pressures to piston holes and cooling channels. These parameters meticulously shed light on the intricate process of scrutinizing and fortifying the engine block, with element size and boundary conditions emerging as pivotal factors shaping analysis outcomes. A meticulous comparison ensued between gray cast iron and A319 aluminum alloy materials, unveiling lower stress values for cast iron, thereby advocating its preference due to reduced stress formation. Furthermore, the comparison of total deformation underscored approximately 0.033mm deformation for cast iron against roughly 0.05165mm for aluminum alloy, further corroborating the preference for cast iron. Modal analysis culminated in unveiling vibration motion at a frequency of 976.92Hz, with a maximum deformation value of 4.7911mm, thereby reinforcing the inherent advantages of cast iron material.

Key Words: Internal Combustion Engine; Engine Block; Design and Analysis; Material Selection; Stress Analysis

ÖZET

Giriş ve Amaç: Bu çalışma, 4 silindirli benzinli bir motorun bloğunun tasarımını ve analizini ele alarak, malzeme seçimi ve hesaplamaları içerir. Motor bloklarında alüminyum alaşımları ve dökme demir yaygın olarak kullanılmaktadır. Motor bloklarında gri dökme demir, A319 ve A356 alüminyum alaşımları sıkça tercih edilir. Dökme demir, yüksek mukavemet ve sertlik özelliklerine sahiptir, ancak ağırlık bakımından değerlendirilmelidir. Bu nedenle, malzeme olarak gri dökme demir tercih edilmektedir. Tasarım parametreleri, D:84,48mm (Silindir çapı) Pmax:7030Kpa(Kabul edilmiştir), σ_m :30N/mm²(Dökme demir malzeme için emniyet gerilmesi). Motor bloğunun tasarımı ve teknik resmi, SOLIDWORKS programı kullanılarak gerçekleştirilmiştir. Tasarım parametreleri şu şekildedir: krank uzunluğu 520mm, krank yarıçapı 42.24mm, biyel uzunluğu 168.96mm, piston çapı 84.48mm ve piston uzunluğu 109 mm'dir. Motor bloğunun analiz işlemleri ANSYS programı kullanılarak gerçekleştirilmiştir. Mesh atma işlemi sırasında, eleman boyutu 2mm olarak belirlenmiş ve element tipi "program controlled" olarak seçilmiştir. Mesh işlemi sonucunda, toplamda 1,827,315 adet düğüm (nodes) ve 1,095,933 adet eleman oluşturulmuştur. Sınır koşulları, motor bloğunun alt kısmı "fixed support" komutu kullanılarak sabitlenmıştır. Ardından, piston deliklerine 8.5MPa ve soğutma kanallarına ise 0.8MPa basınç uygulanmıştır. Bu parametreler, motor bloğunun analizinin yapıldığı ve güçlendirildiği süreci göstermektedir. Eleman boyutu ve sınır koşulları, analiz sonuçlarını doğrudan etkileyebilecek önemli faktörlerdir. İçten yanmalı motor bloğu tasarımı ve analizi başlıklı çalışma kapsamında gri dökme demir ve A319 alüminyum alaşımı malzemeleri kullanılarak karşılaştırma yapılmıştır. Sonuçlara göre, dökme demir malzemesinin gerilme değerlerinin alüminyum alaşımına göre daha düşük olduğu görülmektedir. Bu durum, daha az gerilme oluşan malzemenin kullanım açısından daha uygun olduğunu göstermektedir, dolayısıyla dökme demir malzeme daha avantajlıdır. Total deformasyon karşılaştırması yapıldığında, dökme demir malzemesinde yaklaşık 0.033mm, alüminyum alaşım malzemesinde ise yaklaşık 0.05165mm değerinde bir deformasyon olduğu görülmüştür. Bu da dökme demir malzemenin kullanım açısından bir adım öne geçtiğini göstermektedir. Modal analiz kısmında, titreşim hareketinin 976,92Hz frekansında gerçekleştiği ve maksimum deformasyon değerinin 4.7911mm olarak ölçüldüğü görülmüştür. Sonuç olarak, dökme demir malzemesi daha avantajlıdır.

Anahtar Kelimeler: İçten Yanmalı Motor; Motor Bloğu; Tasarım ve Analiz; Malzeme Seçimi; Gerilme Analizi

**AN EMPIRICAL STUDY ON THE FACTORS EFFECTING DIVIDEND PAY-OUT
POLICIES: EVIDENCE FROM BORSA ISTANBUL**

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Abstract

Dividend allocation decisions are crucial aspects of business policy and are very significant in financial literature. The amount of dividends to be allocated to the shareholders is determined by several variables. The primary factors influencing the dividend policy outcomes are profit levels, financial limitations, investment prospects, corporate scale, and influences of shareholders and regulators. The relation between profit-sharing and agency cost is relatively a new topic which should be explored more with different country conjectures, in the field of corporate finance.

This research examines how dividend pay-out policy might be effective in mitigating agency costs and seeks to analyze the influence of the company's ownership structure, specifically the presence of concentrated shareholders and institutional investors, on its profit-sharing policy. A dataset consisting of 250 firm-year observations has been analyzed. The dataset covers a 5-year period from 2018 to 2022 and includes data from 50 non-financial companies listed on Borsa Istanbul. The findings indicate that the ownership structure has a crucial role in shaping the dividend allocation policies of companies. There is a statistically meaningful positive relation between the institutional ownership percentage and the dividend per share. Moreover, there is a significant positive relation between the level of ownership concentration among the top five shareholders and the dividends pay-outs. The dividend policy is significantly influenced by free cash flow, as it has been anticipated. Empirical research indicates that there is a positive correlation between business size and dividend allocations. The corporations with bigger asset size are more inclined to pay out dividends. The corporations that have more promising investment prospects in the future and larger levels of debt tend to distribute less dividends.

Keywords: Dividends, Corporate Finance, Corporate Governance, Ownership Structure

FUTURE OF CORPORATE GOVERNANCE

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Abstract

The often used mechanisms of corporate governance such as the inclusion of non-affiliated directors on company boards, a capital structure centered on debt, and CEO remuneration, are insufficient in completely resolving the inherent agency issues inside a corporation. While corporate governance mechanisms are intended to reduce the agency problems arising from the separation of cash flow and control rights, they cannot completely eradicate these issues. This is because information between the interested parties are asymmetrically distributed due to existing human behavior related properties, such as limited rationality and benevolence. Moreover, the efficacy of corporate governance varies among different firms. There is still a lack of research that includes a solution that can be applied to several companies. The advances in the blockchain technology have potential to replace long-standing corporate practices that have been in place for decades. It is expected that the utilization of blockchains would significantly diminish organizational inefficiency and misconduct. Blockchain technology improves transparency for parties involved by using its immutable applications and also reduces transaction costs to a great extent. It provides shareholders and stockholders with the necessary information to make more rational choices and hold corporate leaders responsible. This helps to reduce the costs associated with information imbalances, known as agency costs. When compared to traditional ways of confirming and validating transactions via third party intermediaries like banks, lenders, and clearinghouses, blockchain technology offers enhanced transparency, speed, and resistance to errors and corruption. Blockchain transactions are potentially more secure than conventional transactions that rely on third-party intermediaries to validate transactions. Blockchain technology is far quicker than the conventional process of validating transactions via third-party intermediaries. In addition, blockchain technology enables the implementation of smart contracts that facilitate the efficient coordination of agency interactions without errors or transaction costs.

Keywords: Corporate Governance, Blockchain Technology, Finance, Digital Finance, FinTech

VERGİ HUKUKUNDA ZAMANAŞIMI KAVRAMI

CONCEPT OF LIMITATIONS IN TAX LAW

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Özet

Zamanaşımı kavramı, hukuk bilimi bakımından kritik bir öneme sahiptir. Nitekim belli hakların kazanılması veya kaybedilmesinde, kişilerin işlediği suçlardan cezalandırılıp cezalandırılmamasında veya hakların korunmasında zamanaşımı önemli bir yer tutmaktadır. Vergi hukuku bakımından da devletin mükelleflerden alacağı vergiye ilişkin tarh işlemi, tahsil işlemi veya suç işleyen mükellefe verilecek cezaya ilişkin sürelerde zamanaşımı kavramı uygulama alanı bulmaktadır. Zamanaşımına ilişkin süreler belli durumların meydana gelmesi halinde kesilebilmekte veya durabilmekte olup zamanaşımının kesilmesi, kanunda belirtilen gerekçeler doğrultusunda sürenin durması ve yeniden başlaması anlamına gelmekte iken zamanaşımının durması ise yine kanunda yer alan nedenlerin ortaya çıkması ile birlikte sürenin duraklamasını ve ilgili neden ortadan kalktıktan sonra sürenin kaldığı yerden devam etmesi anlamına gelmektedir.

Vergi hukuku bağlamında zamanaşımı dört başlık altında ele alınmış olup tarh zamanaşımı, tahsil zamanaşımı, düzeltme zamanaşımı ve ceza zamanaşımı, bu kapsamda düzenlenmiş zamanaşımı türleridir. Bu zamanaşımı türlerinden tarh zamanaşımı, düzeltme zamanaşımı ve ceza zamanaşımı, Vergi Usul Kanunu'nda düzenlenmişken tahsil zamanaşımı Amme Alacaklarının Tahsil Usulü Hakkında Kanun'da düzenleme altına alınmıştır. Tarh zamanaşımı, vergi alacağının doğduğu takvim yılını takip eden yılın başından başlayarak tarh ve tebliğ edilmeyen vergiler için uygulanmakta olan bir zamanaşımı kavramı iken, tahsil zamanaşımı kamu alacağının vade tarihini takip eden takvim yılı başından itibaren tahsil edilmeyen alacakları kapsamaktadır. Vergi işlemlerinde meydana gelen hataların düzeltilmesi amacıyla yapılan işlemler ile vergi suçları veya vergi kabahatleri ile bunlara verilen cezalara ilişkin zamanaşımı süreleri de bu kapsamda değerlendirilmektedir.

Anahtar Kelimeler: Vergi hukuku, zamanaşımı, tarh zamanaşımı, tahsil zamanaşımı, Vergi Usul Kanunu.

Abstract

The concept of statute of limitations is of critical importance in terms of legal science. As a matter of fact, statute of limitations has an important place in gaining or losing certain rights, in determining whether people are punished for crimes they commit or in protecting rights. In terms of tax law, the concept of limitation finds application in the periods related to the assessment process, collection process of the tax to be collected by the state from the taxpayers, or the penalty to be given to the taxpayer who committed a crime. Periods related to the statute of limitations can be interrupted or stopped in case of certain situations, and the interruption of the statute of limitations means that the period stops and starts again in line with the reasons specified in the law while the suspension of the statute of limitations means that the period is paused when the reasons specified in the law arise and the period starts from where it left off after the relevant reason is eliminated.

In the context of tax law, statute of limitations is discussed under four headings: assessment statute of limitations, collection statute of limitations, correction statute of limitations and penalty statute of limitations. Among these types of limitation; assessment limitation, correction limitation and penalty limitation are regulated in the Tax Procedure Law, while collection limitation is regulated in the Law on the Collection Procedure of Public Receivables. While the limitation period for assessment is a concept of limitation applied to taxes that have not been assessed and notified, starting from the beginning of the year following the calendar year in which the tax receivable arises, the limitation period for collection covers receivables that have not been collected since the beginning of the calendar year following the maturity date of the public receivable. Transactions carried out to correct errors in tax transactions and statute of limitations for tax crimes or tax misdemeanors and the penalties imposed thereon are also evaluated within this scope.

Keywords: Tax law, statute of limitations, limitation of assessment, limitation of collection, Tax Procedure Law

**DEPREMZEDE LİSANS ÖĞRENCİLERİNİN GELECEK KAYGISININ İŞ UMUDU
ÜZERİNDEKİ ETKİSİNE YÖNELİK ALAN ARAŞTIRMASI**

**FIELD RESEARCH ON THE EFFECT OF FUTURE ANXIETY OF
UNDERGRADUATE STUDENTS DURING THE EARTHQUAKE ON THEIR JOB
HOPE**

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ÖZET

Bu çalışma ile hedeflenen genel amaç; gelecek kaygısı olarak ifade edilen ve olumsuz şekilde değerlendirilen duygular ile iş umudu olarak ifade edilen geleceğe yönelik inanç ve beklentileri içeren olgu arasında ilişki ve etkileşim olup olmadığını, varsa ne yönde ve ne derecede bir ilişki ve etkileşim olduğunu belirleyebilmektir. Bu nedenle çalışma, tanımlayıcı tarama ve değişkenler arası etki modeli şeklinde kurgulanmıştır. Araştırmada veri elde edebilmek adına istatistiksel evren Kahramanmaraş ilinde depremi yaşamış ve sağlık bilimleri fakültesi son sınıf öğrencisi olan 358 öğrenci olarak belirlenmiştir. Ana evreni temsil edebilmesi adına %90 güven aralığında örneklem sayısı 150 öğrenciden oluşmaktadır. Araştırmada gelecek kaygısı ve iş umudu olmak üzere iki farklı ölçüm aracından yararlanılmış olup, ölçek güvenirlikleri gelecek kaygısı ölçeğinde (α) ,84 ve iş umudu ölçeğinde ,89'dur. Elde edilen verilerin analizinde SPSS 27 istatistik programı kullanılarak veriler analiz edilmiştir.

Araştırma sonucunda elde edilmiş verilere göre gelecek kaygısı ile iş umudu arasında ($r=-,295$) oranında düşük oranlı negatif yönlü anlamlı bir ilişki tespit edilmiştir. Bu durum araştırma öncesi de beklenen olağan bir sonuçtur. Ayrıca iş umudunun olumsuz olarak ortaya çıkmasının %81'inin gelecek kaygısı tarafından açıklanabilir olduğu ve istatistiksel olarak anlamlı düzeyde etkileneceği sonucuna ulaşılmıştır. Gelecek kaygısının, iş umudunu $\beta:-,295$ düzeyinde negatif yönde etkileyebileceğini de söylemek mümkündür. Sonuç olarak elde edilmiş veriler araştırma hipotezlerini desteklediği söylenebilir.

Anahtar Kelimeler: Gelecek kaygısı, iş umudu, lisans öğrencileri, deprem bölgesi

ABSTRACT

The general aim of this study is; It is to determine whether there is a relationship and interaction between the emotions expressed as future anxiety and evaluated negatively and the phenomenon that includes future beliefs and expectations expressed as job hope, and if so, in what direction and to what extent there is a relationship and interaction. For this reason,

the study was designed as a descriptive scan and an effect model between variables. In order to obtain data in the study, the statistical population was determined as 358 students who experienced the earthquake in Turkey/Kahramanmaraş province and who were senior students at the faculty of health sciences. In order to represent the main population, the sample size consists of 150 students within the 90% confidence interval. Two different measurement tools, future anxiety and job hope, were used in the study, and the scale reliabilities were .84 in the future anxiety scale (α) and .89 in the job hope scale. In the analysis of the obtained data, the data was analyzed using the SPSS 27 statistical program.

According to the data obtained as a result of the research, a negative and significant relationship with a low rate of ($r = -.295$) was determined between future anxiety and job hope. This is a normal result expected before the research. In addition, it was concluded that 81% of the negative emergence of job hope can be explained by future anxiety and will be affected at a statistically significant level. It is also possible to say that future anxiety may negatively affect job hope at the $\beta: -.295$ level. As a result, it can be said that the data obtained supports the research hypotheses.

Key Words: Future anxiety, job hope, undergraduate students, earthquake zone

1. GİRİŞ

Deprem, birey ve toplum üzerinde hem psikolojik hem de sosyolojik olumsuz etkiler ortaya çıkartan olgudur. Depremler özellikle de deprem yaşanmış bölgelerde yaşayan insanlar üzerinde korku, endişe, stres, travma gibi duygusal tepkiler ortaya çıkartarak, sürekli bir endişe kaynağı ortaya çıkartmaktadır. Toplumsal yapı içerisinde en çok etkilenen gruplar arasında okul çağındaki öğrenciler yer alabilmektedir. Öğrencilerin depremlerden etkilenme derecesi ise, yaşanan depremin şiddeti ve öğrenci destek sistemlerinin hazır olup olmaması gibi çeşitli faktörlere göre değişiklik gösterebilmektedir. Çalışma konumuzun ana değişkeni olan öğrencilerin gelecek kaygısı da, deprem sonrasında yaşanan durumlara bağlı olarak artış gösterebilmektedir.

Deprem sonrasında hayatta kalmış bireylerde ölüm korkusu, evlerini ve ailelerini kaybetme düşüncesi olduğu gibi bunlara ilaveten öğrencilerde okula devam edememe kaygısı, geleceğe dair umutsuzluk ve karamsarlık gibi durumlar ortaya çıkabilmektedir. Hâlihazırda hem okuyup hem de çalışmakta olan öğrencilerde ise daha iyi bir iş imkânına ve tatmin edici ücret düzeyine sahip olma, sosyal ve ekonomik durumunu daha iyi bir noktaya getirme ve böylelikle hem kendisi hem de ailesi-için daha iyi imkânlara sahip olma isteği ön plana çıkabilmektedir.

Çalışma konumuzun ikinci değişkeni olan iş umudu unsurunda ise, öğrencilerin almış oldukları eğitim seviyesi, elde ettikleri beceriler, ekonomik koşullara bağlı olarak istihdam imkânları ve kişisel hedefler gibi farkı düzeyde unsurun etkili olduğunu söylemek mümkündür. Çünkü iş umudu genellikle öğrencilerin geleceğe yönelik planları ile birlikte kariyer hedefleri ve istihdam beklentilerini ifade eden bir kavramdır. Başka bir ifade ile öğrencilerin iş umudunun kişisel, eğitimsel ve çevresel unsurlara göre değişiklik gösterebileceğini söylemek mümkündür.

Araştırmamızın ana değişkenleri olan iş umudu ile gelecek kaygısı birbirine bağımlı olgular olduğu düşünülebilir. Bu nedenle de iki kavramın bir arada irdelenmesi gerekir. Hayal edilen meslekte çalışmaya başlamak, sosyo ekonomik refah düzeyinin yükselmesi veya kendine zaman ayırabilecek bir işte çalışma imkânları, genellikle üniversitelerden mezun olan kişiler tarafından daha kolay elde edilebilmektedir. Bu nedenle de gerek gelecek kaygısı gerekse iş umudu özellikle üniversite son sınıfta daha çok ortaya çıkmaktadır.

İş bulma aşamasında tecrübeli personel alımlarının öncelikli olması, yeterli düzeyde eğitim alamamaktan kaynaklanabilecek işi öğrenememe korkusu, işe alım sonrasında ise çalışma arkadaşlarıyla uyum sağlayamama, etkin ve verimli performans gösterememe veya genel olarak işveren veya yöneticilere karşı kendini ispatlayamama kaygılarının olması gibi durumların mezun olacak veya yeni mezun olan öğrencilerde iş umutlarının düşük olmasına etki edebileceğini söylemek mümkündür.

Bu çalışmada deprem bölgesinde lisans düzeyinde öğrenim gören öğrencilerin deprem sonrası iş kaygılarının iş umudu üzerindeki etkisi incelenmiştir. Bu amaç doğrultusunda sadece yüz yüze eğitimin devam ettiği sağlık bilimleri fakültesi son sınıf öğrencileri üzerinde araştırma yapılabilmektedir. Çalışmanın literatür kısmı alan yazındaki ikincil veriler ile oluşturulmuş, araştırma verilerinin analizi ile de uygulama aşaması tamamlanarak çalışma nihai hale getirilmiştir.

2. KAVRAMSAL ÇERÇEVE

2.1. Gelecek Kaygısı

Kaygı durumu, bireylerin düşük başarı veya başarısız olma durumu karşısında ortaya çıkan duygu durumu olarak ifade edilir (Margalit & Zak, 1984, 537). Bu nedenle de kaygının zihinsel ve duygusal bir süreç olduğunu ifade etmek mümkündür. Ancak ortaya çıkarttığı fiziksel sonuçlar da dikkate alındığında birey üzerinde fizyolojik tepkilere de neden olabilmektedir. Bu nedenle Türköz vd., (2021)'e göre kaygı durumu, bireylerin iç ve dış dünyasında karşı karşıya kalabileceği bilişsel, duygusal ve fizyolojik tepkiler olarak ifade edilmektedir (Türköz vd., 2021, 133). Kaygı kavramı, içeriğinde olumsuzluk barındıran kavramlar arasındadır. Başka bir ifade ile kaygı durumunun ortaya çıkması birey üzerinde olumsuz etkiler ortaya çıkarabileceği düşüncesini ortaya çıkartmaktadır. Ancak kaygı durumunun belirli düzeyde olması veya kontrol altına alınabilmesi durumunda, olumlu sonuçlar ortaya çıkarabileceğini savunan araştırmacılar da vardır. Bireyde ortaya çıkan kaygı durumuna karşı olumlu düşünce hâkimse Akgün vd. (2007)'e göre uyarıcı, koruyucu ve motive eden olumlu bir durum ortaya çıkabilecektir. Bu durum bireyin toplum içerisinde önemli bir konuma gelmesinde destek olabileceği gibi, motivasyon düzeyini arttırıp, öğrenmeye karşı istekli olmasına neden olabilecektir. Bireyin kaygı durumunu etkili yönetemediği olumsuz kaygı söz konusu olması durumunda ise başarısız olma düşüncesi ile kaygının esiri haline gelebilecek ve başarabileceğinden daha azı için uğraşacaktır (Akgün vd., 2007, 284).

Kaygı durumu, hafif, orta ve yüksek olmak üzere üç farklı düzeyde ortaya çıkabilmektedir. Hafif ve orta düzeydeki kaygı durumu, bireyi motive eder ve bireyi çalışmaya sevk edebilir. Yüksek düzeyli kaygı durumu ise bireyin kendini çaresiz hissetmesine neden olabileceği için istenmeyen bir durum olarak değerlendirilmektedir (Türköz vd., 2021, 136). Kaygı durumu; anksiyete bozukluğu, sosyal kaygı bozukluğu, fobi gibi çeşitli şekillerde kendini gösterebilir. Bu çeşitler arasında gelecek kaygısı da yer alabilir.

Gelecek kaygısı; endişe, korku, belirsizlik hali ve olumsuz yönlü değişimlerin ortaya çıkarabileceği kaygı durumu olarak düşünülebilmektedir. Yüksek düzeyde ortaya çıkabilecek gelecek kaygısı ise, bireyin yaşantısında tehdit ortaya çıkarabilmektedir (Zaleski, 1996, 165). Başka bir ifade ile gelecek kaygısı, geleceği ilgilendiren korku ve endişe durumlarını kapsayıcı bir durumdur (Zaleski vd., 2017, 2). Söz konusu bu olumsuz durum karşısında bireylerin geleceğe yönelik kaygı durumlarının temelinde, özyeterlilik konusunda eksiklik veya güven duygusunun yeterli olmaması yer alabilmektedir. Özellikle de öğrencilerin geleceğe dair gelecek kaygıları, motivasyonlarını ve eğitime yönelik tutumlarını olumsuz yönde etkileyebilmektedir (Hammad, 2016, 62).

Üniversite eğitimi almakta olan öğrenciler, eğitim ve öğretim süreçleri içinde elde edebilecekleri bilgi ve becerileri, iş hayatında uygulayabilmeyi, bu sayede de yüksek statüsü ve refah bir yaşam tarzı elde etmeyi umut ederler. Elde edilebilecek bilgi, beceri ve yeteneklerin düşük olması durumunda ise, çevresel ve ekonomik unsurların da etkisi ile kendilerini gelecek kaygısı ile karşı karşıya bulabilirler. Bu durum ise, öğrencilerin hayal ettikleri ve istedikleri meslekleri yapabilmelerine engel olabilmektedir.

Üniversite eğitimi almakta olan öğrencilerin gelecek kaygısı taşımaya başlamaların temelinde, geleceğe dair belirsizliklerin çok olması yatabilmektedir. Çakmak ve Hevedanlı (2005)'ya göre bu durum öğrencilerin algısını esir almakta ve yersiz korkulara kapılmalarına neden olabilmektedir (Çakmak & Hevedanlı, 2005, 116). Aynı zamanda bu kaygı durumu öğrencilerin stres, umutsuzluğa kapılma, kötümser düşüncelere sürüklenme ve baskı altında hissetme gibi durumlarla karşı karşıya kalmalarına da neden olabilmektedir (Geylani & Yıldız, 2022, 285).

Daha önce belirtildiği gibi üniversite öğretimi gören öğrencilerin gelecek kaygısında bir çok etmen söz konusu olabilmektedir. Örneğin bireyin içinde yer aldığı sosyal çevre, bireyin karar verme yetisine olumlu veya olumsuz etki edebilmektedir. Sosyal çevrenin en temel kaynağı ise ailedir. Ailenin, öğrencilerin geleceğine yönelik sergileyecekleri olumsuz tutum ve davranışlar, öğrencinin gelecek kaygılarının artmasına sebebiyet verebileceği aşîkârdır. Ailenin yüksek beklentilerine karşılık verememe (Varol, 1990, 10) düşüncesi dahi öğrencileri ayrı bir kaygı durumu ile karşı karşıya bırakabilmektedir.

Lisans ve lisansüstü düzeyinde öğrenim gören öğrencilerin gelecek kaygısına yönelik olarak yapılan çalışmalar incelendiğinde daha çok öğrencilerin demografik özellikleri üzerinden araştırma yapıldığı görülebilmektedir. Kula & Saraç, (2016) tarafından yapılan çalışmada cinsiyet, okudukları fakülte/yüksekokul, ebeveynlerin tutumu, ailelerin aylık gelirleri ile barınma yerleri gibi etmenlerin öğrencilerin gelecek kaygı düzeyleri ile ilişki olduğu sonucuna ulaşıldığı ifade edilmiştir. Türköz vd., (2021)'nin lisans üstü öğrenciler üzerinde yaptığı çalışmada ise öğrencilerin lisansüstü eğitime akademisyen olabilmek için yani daha çok gelecek kaygılarını azaltmak için tercih ettikleri, bu nedenle de kişisel gelişimlerine odaklandıkları sonucuna ulaşıldığını ifade etmişlerdir. Son olarak yorulmaz (2019) tarafından yapılan çalışmada ise öğrencilerin okudukları bölümlere göre gelecek kaygısı düzeylerinin değiştiği sonucuna ulaşıldığı ifade edilmiştir.

2.2.İş Umudu

Umut, geleceğe dair olumlu beklenti ve inanç duygusu olarak ifade edilebilir. Kanak ve Özen (2018)'e göre umut; ulaşmak istenen hedefler doğrultusunda beklentiye girilmesi, umutsuzluk ise, hedefler konusunda beklentiye girilmemesi durumudur (Kanak & Özen, 2018, 458). Bu bağlamda Miller ve Powers (1988) umudu, olumsuz algılamalardan kurtulma, iyi düşünce halinin devamı ve geleceğe yönelik olumlu beklentiler olarak tanımlamışlardır. Umudun özünü oluşturan olumlu beklentiler ise; hayatın amacı, çevre ile etkin bir iletişim sistemi kurma, zor durumlarla başa çıkma becerisi gösterme ve ruhsal olarak iyi olma gibi kavramlarla desteklenmektedir (Miller & Powers, 1988, 8). Bu nedenle de Sarı ve Tunç (2016), umut kavramını; bireylerin fiziki ve ruhsal sağlığını koruyucu, hayatlarını yönlendirici ve geleceklerini planlamada etkin rol alan duygusal güç olarak tanımlamışlardır (Sarı & Tunç, 2016, 292). Bu tanımlı destekleyici şekilde Akman ve Korkut (1993) ise umudu, bireylerin özünde olan olumlu his şeklinde ifade etmişlerdir (Akman & Korkut, 1993, 197).

Umudun ileride çalışılacak veya hâlihazırda çalışılan iş ile ilgili olması durumunda iş umudu kavramı ortaya çıkmaktadır. Bu anlamda iş umudu Belen (2016) tarafından, bireylerin temel

ihtiyaçlarını karşılaması için iş arayışında olması olarak tanımlanmaktadır. İş arayışı sırasında ise, bireyin yetenek ve becerileri ön plana çıkacaktır (Belen, 2016, 11).

İş umudu kavramının, bir kişinin gelecekte iş bulma veya hedeflediği kariyer konusunda olumlu bir beklentiye sahip olmasıdır. İş umudunun yüksek olması, bireyin iş bulma konusundaki çaba ve motivasyon seviyesini de arttırıcı olabileceğini söylemek mümkündür. Bu düşünce Peterson ve Byron (2008) tarafından yapılan çalışmada “yüksek umutlu bireyler, düşük umutlu bireylere göre daha fazla hedef odaklı stratejiye sahiptirler ve hedeflerine ulaşma konusunda daha motivedir” sözleri ile desteklenmektedir (Peterson & Byron, 2008, 785).

Alan yazında iş umudunun psikolojik güçlendirme ve amaç yönelimi olmak üzere iki alt boyutta toplanabileceği ifade edilmektedir. Küpana (2017)’ya göre psikolojik güçlendirme boyutunda; bireyin kendisine yönelik inançları, özbenliğine duyduğu saygı ve güven ile sahip olduğu yetenekleri doğrultusunda hedef belirlemesi ve bu hedeflere ulaşabilecek planlar yapması durumu söz konusudur. İkinci boyut olarak ifade edilen amaç yöneliminde ise; bireyin geçmiş deneyiminden yola çıkarak yeni hedefler belirlemesi ve hedeflerine ulaşacak arayış için kendine güvenmesi, hedefe ulaşmada sahip olduğu imkânlar yer almaktadır (Küpana, 2017, 352).

2.3. Gelecek Kaygısının İş Umudu Üzerindeki Etkisi

Gelecek kariyer ve iş hayatına önemli bir adım olarak kabul edilen üniversite eğitiminde özellikle son dönemler, öğrenciler açısından gelecek kaygısı ve kaygı belirtilerinin en fazla olduğu (Bozkurt, 2004, 53) dönem olarak değerlendirilmektedir. Bu dönemde ortaya çıkan kaygı durumlarının yoğun şekilde yaşanmasının nedeni öğrencilerin gelecek kariyer hedefleri, elde edilebilecek refah düzeyi ile istihdam edilme durumlarını da etkileyebilmektedir. Gelecek kaygısının temelinde ise, sosyal çevreden, psiko-sosyal etmenlere ve ailelerin tutum ve davranışlarına kadar çok çeşitli unsurlar yer alabilmektedir.

Öğrencilerin gelecek kaygısı, ilerleyen zaman dilimlerindeki sosyal ve ekonomik değişim unsurlarını belirleyebileceği için, iş bulma veya bulunan işte ilerleme konusundaki imkanlardan yararlanamama endişesinden kaynaklı olumsuz duygu durumlarını içerisinde barındırmaktadır (Kara vd., 2020, 153). Bu nedenle de öğrencilerin iş ya da işsizlik hayatlarının ilk adımı olan mezuniyet aşaması ve sonrasındaki umut ve beklentileri ortaya koymaktadır. Bu beklentilerin olumlu veya olumsuz olmasında iş seçimleri, arkadaş çevresi veya sorumluluk alma korkusu gibi çeşitli unsurlar etkili olabilmektedir (Çakmak & Hevedanlı, 2005, 116). Bireyler üniversitenin bitimi ile başlayan süreçte gelecek ile ilgili net kararlar almak zorundadır. Öncelikle iş umudu ile başlayan kararlar, bireylerin tüm yaşantısını etkileyecektir. Rahat bir gelecek yaşamak isteyen bireyler yetenekleri ve becerileri doğrultusunda iş arayışına gireceklerdir.

Ülkenin geleceğini oluşturan üniversite mezunları, toplumun gelişiminde önemli yer kaplar. Günümüzde hâkim olan işsizlik sorunu bireylerin iş umudunu kaybetmesine yol açmaktadır (Mirzeyev, 2019, 4). İşsizlik sorunu nedeniyle öğrenciler eğitim hayatlarından itibaren gelecek ile ilgili kaygılanmaya başlarlar. Öğrencide oluşan bu kaygı; strese, baskıya, psikolojik sorunlara, depresyona, kötümser düşüncelere ve umutsuzluğa yol açabilmektedir.

Kahramanmaraş merkezli deprem başta Kahramanmaraş olmak üzere 11 ili etkisi altına almıştır. Asrın felaketi olarak nitelendirilen deprem ülkemiz ve dünyadaki depremler göz önüne alındığında yüz yılın en büyükleri arasında yerini almıştır (Kipay, 2023, 855). Deprem sonrasında maddi ve manevi birçok kayıplar meydana gelmiştir. Depremi yaşayan herkeste gelecekle ilgili kaygılar ortaya çıkmıştır.

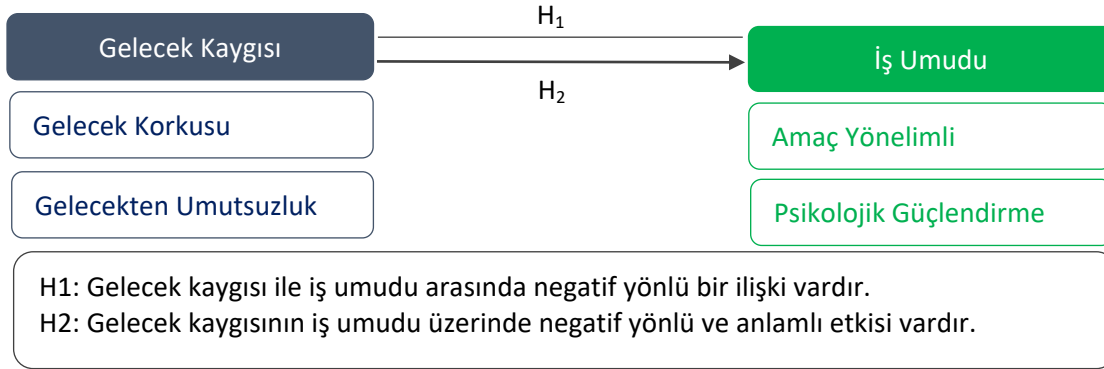
Bu çalışmada depremi yaşamış olan Kahramanmaraş ili Kahramanmaraş Sütçü İmam Üniversitesi sağlık bilimleri fakültesinde öğrenim gören dördüncü sınıf öğrencilerine yönelik gelecek kaygısı ve iş umudu ile ilgili anket çalışması yapılmıştır. Literatür incelendiğinde deprem sonrasında gelecek kaygısı ve iş umudu konuları ile ilgili doğrudan bir çalışmaya rastlanmamıştır. Ancak iki konu birden fazla ortak noktada (kariyer planlama, yetenek ve beceri, düzenli bir gelecek kurmak) gibi birleşmektedir. Özellikle üniversiteden mezun olan birey gelecek kaygısını azaltabilmek için öncelikle kendisine uygun iş arayışına girecektir. Bundan dolayı depremzede öğrencilerin gelecek kaygısının iş umudunu doğrudan etkileyeceği düşünülmektedir.

3. YÖNTEM

3.1. Amaç, Yöntem ve Araştırma Modeli

Bu çalışmanın amacı üniversitede lisans seviyesinde okuyan son sınıf öğrencilerinin gelecek kaygılarının iş umudu üzerinde etkisi olup olmayacağını, etsi varsa ne yönlü bir etki ortaya çıkartacağını belirlemeye yöneliktir. Çalışmada nicel araştırma yöntemi kullanılmıştır. Veri elde edebilmek adına anket yöntemiyle toplanan formlar SPSS 27 programı ile analiz edilmiştir. Değişkenler üzerinde faktör analizi, güvenirlik ve geçerlilik analizi, korelasyon ve regresyon analizleri yapılmıştır.

Araştırmaya yönelik olarak kurgulanan model aşağıda sunulmuştur.



Şekil 1: Araştırmanın Modeli ve Hipotezleri

3.2. Evren, Örneklem ve Örneklem Demografik Özellikleri

Araştırmasının evreni Kahramanmaraş ilinde kamu niteliğinde eğitim hizmeti veren Kahramanmaraş Sütçü İmam Üniversitesi sağlık bilimleri fakültesinde (www.ksu.edu.tr) öğrenim gören toplam 358 adet dördüncü sınıf öğrencilerden meydana gelmektedir. Araştırmanın örneklemi 150 öğrenci oluşturmaktadır.

Ana evren sayısına göre %95 güven aralığında yapılan örneklem tespitine göre örneklem 186 kişi olması gerektiği tespit edilmiştir. Bu doğrultuda ana evrende yer alan öğrencilere kolayda örneklem yöntemi ile 200 adet anket formu dağıtılmıştır. Ancak öğrencilerin barınma ve deprem dolayısı ile okula devam zorunluluğunun olmaması sebepleri ile 160 adet geri dönüş sağlanabilmiştir. Eksik veya hatalı olan 10 anket analiz dışında tutularak 150 anket formu analize tabi tutulmuştur.

Araştırmaya katılan öğrencilerin demografik özellikleri incelendiğinde; katılımcıların 100 kişi (%66,7) kadın, 50 kişi (%33,3) erkeklerden oluştuğu, 141 kişi (%94,0) bekâr, 9(%6,0) evli olduğu, yaş dağılımına göre ise çoğunluğun 18-22 yaş arası 108 kişi (%72,0), en az ise 30-35 yaş arası 15 kişi (%10,0) olduğu görülmektedir.

Araştırmaya katılan öğrencilerin tamamı sağlık bilimleri fakültesi son sınıf (4.sınıf) öğrencisi oluşturmaktadır. Gelir durumuna göre ise çoğunluğun 1000-5000 arasında 71 kişi (%47,3) ile oluşturduğu, en az grubun ise 5000-7500 arasında 17 kişi (%11,3) oluşturduğu tespit edilmiştir.

Katılımcıların ev hasar durumuna bakıldığında; 112 kişinin (%74,7) az hasarlı, 18 kişi (%12,0) kişinin orta hasarlı olduğu, 10 kişi (%6,7) kişinin ağır hasarlı olduğu ve 10 kişi (%6,7) kişinin evinin yıkıldığı tespit edilmiştir.

Depremde yakınlarını kaybetme düzeyine ilişkin analizlere göre ise; Anne, baba, kardeşini kaybedenlerin sayısı; 2 kişi (%1,3), akraba, arkadaşını kaybedenlerin sayısı 76 kişi (%50,7), yakınlarını kaybetmeyenlerin sayısı ise 72 kişi (%48) olarak tespit edilmiştir.

3.4. Veri Toplama Araçları, Güvenilirlik ve Faktör Analizine İlişkin Sonuçlar

Bu çalışmada verileri elde etmek amacıyla anket yöntemi kullanılmıştır. Anket formu üç kısımdan oluşmaktadır. Birinci kısım demografik özellikleri tespit etmek için 7 adet kapalı uçlu (cinsiyet, medeni durum, yaş, sınıf, gelir düzeyi, ev hasar durumu, depremde yakınınızı kaybettiniz mi?) soru sorulmuştur. İkinci kısımda gelecek kaygısını ölçmek için 19 soru ve üçüncü kısımda iş umudunu ölçmek için 13 ifadeye yer verilmiştir. Anketler SPSS 27 programı ile analiz edilmiştir. Veri toplama ölçeklerine ilişkin bilgiler aşağıdaki gibidir.

Gelecek Kaygısı Ölçeği:

Araştırma kapsamında öğrencilerin gelecek kaygısını ölçümlemek adına Geylani & Yıldız (2021) tarafından geliştirilen “Üniversite Öğrencileri Gelecek Kaygısı Ölçeği” kullanılmıştır. Söz konusu ölçekte “Yaşadığım sorunların uzun süre devam edecek olma ihtimalinden korkuyorum” ifadeleri gibi 19 soru önermesi vardır. Cevaplamalarda 5’li likert kullanılmaktadır. 2-4-6-8-10 ve 12. sorular gelecekte umutsuzluk boyutunu oluşturmakla birlikte sorular tersten kodlanmıştır. Geri kalan soru önermeleri ise 1-3-5-7-9-11-13-14-15-16-17-18 ve 19. sorular ise gelecek korkusu boyutu olarak adlandırılmıştır. Çalışma içerisinde orijinal ölçeğe uygun hareket edebilmek adına boyutlandırmalar olduğu gibi kullanılmıştır. Yapılan araştırmada ölçeğin güvenilirlik ve faktör analizi sonuçları aşağıda sunulmuştur.

Tablo 1: Gelecek Kaygısı Ölçeği Güvenirlilik Bulguları

Cronbach's Alpha (α)		Mevcut Çalışma				Geylani ve Yıldız (2021)	
Ölçek	Alt Bileşenler	(α)	Toplam (α)	Varyans	Toplam Varyans	(α)	Toplam (α)
Gelecek Kaygısı	Gelecek Korkusu	0,78	0,84	44,334	64,687	0,95	0,90
	Gelecekten Umutsuzluk	0,88		20.353		0,88	
	Kaiser Meyer Ölçek Güvenirliliği	,849					
	Bartlett's Küresellik Testi	1038,276					
	Ki-Kare	153					
	Sd	,000					
	P Değeri						

Gelecek kaygısı ölçeğin genel Cronbach's Alpha (α) değeri incelendiğinde 0,84 (KMO: ,849; Ki-Kare: 1038,276; sd: 153; p:,000); alt boyutlarından gelecek korkusunun 0,88 ve

gelecekte umutsuzluğun 0,88 Cronbach's Alpha (α) değerine sahip olduğu sonucu tespit edilmiştir. Söz konusu ölçek toplam varyansın 64,687'sini açıklayabilme değerine sahiptir.

Gelecek kaygısı ölçeğinde yer alan soru önermelerinin faktör analizine göre on sekiz sorunun sırasıyla; ,552; ,674; ,623; ,598; ,512; ,560; ,650; ,665; ,590; ,572; ,644; ,642; ,576; ,760; ,679; ,694; ,628; ,635 değerlerinde faktör yükü almıştır. 10. Soru yeterli faktör yükü almadığından dolayı analiz dışında bırakılmıştır.

İş Umudu Ölçeği

Araştırma kapsamında bağımsız değişken olan öğrencilerin iş umudunu ölçümlemek adına Hong ve Choi (2013) tarafın geliştirilen ve Akın vd. (2013) tarafından Türkçe uyarlaması yapılan "Kısa İş Umudu Ölçeği" kullanılmıştır. Söz konusu ölçekte 14 soru önermesi vardır. Bunlardan 1-4 arası sorular amaç yönelimli boyutunu 5-14 arası sorular ise psikolojik güçlendirme boyutu olarak adlandırılmıştır. Çalışma içerisinde orijinal ölçeğe uygun hareket edebilmek adına boyutlandırmalar olduğu gibi kullanılmıştır. Yapılan araştırmada ölçeğin güvenilirlik ve faktör analizi sonuçları aşağıda sunulmuştur.

Tablo 2: İş Umudu Ölçeği Güvenirlik Bulguları

Cronbach's Alpha (α)		Mevcut Çalışma				Akın vd (2013)	
Ölçek	Alt Bileşenler	(α)	Toplam (α)	Varyans	Toplam Varyans	(α)	Toplam (α)
Gelecek Kaygısı	Amaç Yönelimli	0,75	0,89	52,318	69,204	0,85	0,93
	Psikolojik Güçlendirme	0,72		16.886		0,90	
	Kaiser Meyer Ölçek Güvenirliliği	,852					
	Bartlett's Küresellik Testi	922,755					
	Ki-Kare Sd P Değeri	66,000					

İş umudu ölçeğin genel Cronbach's Alpha (α) değeri incelendiğinde 0,89 (KMO: ,852; Ki-Kare: 922,755; sd: 66; p:,000); alt boyutlarından amaç yönelimli boyutunun 0,75 ve psikolojik güçlendirme boyutunun 0,72 Cronbach's Alpha (α) değerine sahip olduğu sonucu tespit edilmiştir. Söz konusu ölçek toplam varyansın 69,20'sini açıklayabilme değerine sahiptir.

İş umudu ölçeğinde yer alan soru önermeleri sırasıyla; ,703; ,704; ,765; ,637; ,597; ,616; ,800; ,767; ,773; ,796; ,874; ,905; ,403 ve; ,711 değerlerinde faktör yükü almıştır. 13. soru önermesi geçerli faktör yükünü almadığından dolayı analiz dışında bırakılmıştır. İş umudu ölçeğinde soru ifadeleri toplam varyansın %69,20'sini açıklamaktadır.

3.5. Değişkenler Arası Korelasyon Bulguları

Araştırmanın temel amacı öğrencilerin gelecek kaygısının iş umudu üzerindeki etkisini belirlemeye yöneliktir. Değişkenler arası etkileşim olup olmadığını irdelemeden önce değişkenler arasında korelasyon ilişkisi olup olmadığı irdelenmiştir. Yapılan korelasyon analizi sonuçlarına göre elde edilen verilere aşağıdaki tabloda yer verilmiştir.

Tablo 3. Korelasyon Analizine Ait Sonuçlar

Değişkenler		Gelecek Kaygısı	İş Umudu
Gelecek Kaygısı	Sig. (2-tailed): ,000	1	
İş Umudu	N:150	,-295**	1

**Korelasyon 0,01 düzeyde anlamlıdır (** p < 0,01, * p < 0,05)

Yapılan korelasyon analizi sonucunda elde edilen verilere göre gelecek kaygısı ile iş umudu arasında $r=-,295$; $p<0,00$ düzeyinde negatif yönlü ve anlamlı düşük bir korelasyon ilişkisi olduğu tespit edilmiştir. Elde edilen bu verilerin test edilmek istenen “H1: Gelecek kaygısı ile iş umudu arasında negatif yönlü bir ilişki vardır” şeklinde kurgulanan hipotezi desteklediği sonucuna ulaşıldığını söylemek mümkündür.

3.6.Değişkenler Arası Regresyon Bulguları

Tablo 4. Regresyon Analizine Ait Sonuçlar

Model	Katsayı				
	Beta	t	Sig.	Mean	St. Dev.
a.Bağımlı Değişken: İş Umudu $R^2=0,81$ $F=2882,070$ $P=,000$	-,295	-3,751	,000	4,1478	,56570
b. Predictors (Contacts), Gelecek Kaygısı					
Anova ^{a=} sig.;, 000 ^b	Coefficient ^a : Sig.;, 000 ^b				

Regresyon analizinden elde edilen sonuçlara göre, iş umudunun olumsuz olarak ortaya çıkmasının %81'inin gelecek kaygısı tarafından açıklanabilir olduğu ve istatistiksel olarak anlamlı düzeyde etkileneceği görülmektedir. Beta değeri $[(\beta=-,295), (p<0.05)]$ incelediğinde, “H2: Gelecek kaygısının iş umudu üzerinde negatif yönlü ve anlamlı etkisi vardır” şeklinde kurgulanan hipotez kabul edilebilir olduğu görülmektedir.

4. SONUÇ VE ÖNERİLER

6 Şubat 2023 tarihinde Kahramanmaraş merkezli meydana gelen deprem, toplam 11 ilde maddi ve manevi büyük zararlara neden oldu. Ekonomik ve sosyal hayat gibi birçok alanda ortaya çıkan olumsuzluklar, eğitim öğretim faaliyetlerini de etkiledi. Faaliyetlerin durma nedeni sadece eğitim görülen okulların zarar görmesi değil, depremi yaşayan öğretmen ve öğrencilerin vefatı veya eğitim imkanlarının kalmamasından kaynaklıydı. Depremi yaşamış ama hayatta kalan öğretmen ve öğrenci statüsündeki bireylerin, psikolojik sağlık durumları yani öğretme ve öğrenme durumlarının da problemlili hale gelmesi de çözümlenmesi gereken önemli unsurlardan biri haline geldi.

Bu çalışmanın ana amacı deprem bölgelerinde depremi yaşamış olan öğrencilerin sekteye uğrayan eğitim öğretimleri nedeni ile ortaya çıkabilecek gelecek kaygılarının iş umutları üzerinde etkisinin olup olmayacağını tespit etmektir. Bu amaç doğrultusunda çalışmanın ana evreni merkez üssü Kahramanmaraş olan ve asrın felaketi olarak da nitelendirilen Kahramanmaraş ilindeki üniversite öğrencilerini kapsamaktadır. Ancak evrenin yüz yüze eğitimin yapılabildiği sağlık bilimleri fakültesinde öğrenim gören son sınıf öğrencilerini kapsamasına karar verilmiştir. Ana evreni temsilen seçilen örneklem sayısı ise 150 öğrencidir.

Araştırmada kapsamında kullanılan ölçüm araçları, gelecek kaygısı ve iş umudu ölçekleridir. Ölçeklerin güvenilirlik bulguları $\alpha: ,90$ ve $\alpha: ,93$ düzeyindedir. Gönüllü katılımcıların verdiği yanıtlarla elde edilen veriler SPSS 27 programı ile analiz edilmiştir.

Gelecek kavramı kaygı ifadesi ile bir araya geldiğinde, olumsuzluk ortaya çıkartan bir kavramdır. Alan yazında da gelecek kaygısı, bireylerin geleceğe yönelik olumsuz duygu ve

düşüncelerini kapsayıcı olması yönü ile irdelenmektedir. İş umudu ise, bireylerin iş hayatları ve kariyer hedeflerine ilişkin olumlu yanırları ele almakla birlikte, umudun az olması durumu da söz konusu olduğunda olumsuzluk durumu ortaya çıkartabilmektedir. Bu açıdan bakıldığında bireylerin gelecek kaygılarının azalması iş umutlarının artması ile ilişkilendirilebilmektedir.

Yapılan çalışmada elde edilen veriler gelecek kaygısı ile iş umudu arasında ($r=-295$) oranında düşük oranlı negatif anlamlı bir ilişki olabileceğini ortaya koymaktadır. Başka bir ifade ile iş umudu artması ile kaygı düzeyinin azalması birbiri ile ilişkili olabilecek kavramlardır. Araştırmanın iki değişkeni arasındaki etki incelendiğinde; iş umudunun olumsuz olarak ortaya çıkmasının %81'inin gelecek kaygısı tarafından açıklanabildiği, başka bir ifade ile gelecek kaygısının iş umudu algısının β : -295 düzeyinde negatif yönde etkileyebileceği sonucuna ulaşılmıştır.

Araştırma kapsamında sonuç olarak elde edilen veriler “H1: Gelecek kaygısı ile iş umudu arasında negatif yönlü bir ilişki vardır” ve “H2: Gelecek kaygısının iş umudu üzerinde negatif yönlü ve anlamlı etkisi vardır.” İfadeleri ile oluşturulan araştırmanın hipotezlerini desteklemektedir.

Literatür incelendiğinde gelecek kaygısı ve iş umudu arasında ilişki ve etkisi üzerinde deprem bölgesinde yapılmış bir çalışmaya rastlanılmamıştır. Bundan dolayı yapılan bu araştırmanın bulguları önceki çalışmalar ile karşılaştırılamamıştır. Çalışmanın sadece deprem meydana gelen Kahramanmaraş'ta ve sağlık bilimleri fakültesinde yapılmış olması çalışmanın en büyük sınırlılığını oluşturmaktadır. Çalışmanın belirli zaman aralığında yapılması farklı bir zamanda yapılacak olan çalışmalara göre sonucu etkilenecek olması da bir sınırlılığdır. Elde edilen çalışma bu iki değişkenle ilgili çalışma yapacak araştırmacılara yol gösterici olması beklenmektedir. İki değişkenin deprem meydana gelen farklı şehirlerde ve farklı eğitim dallarında yapılması bundan sonraki çalışmalara önerilebilir.

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ACCOUNTING: HOW IT ALL STARTED AT THE END OF THE 15TH CENTURY

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ABSTRACT

Luca Pacioli, an Italian Franciscan brother, maestro of the *abacus* (commercial mathematics), professor at several Italian universities, was the first author of a printed text on accounting. He has contributed to society in various fields such as art, architecture, mathematics, statistics, calligraphy and business, being considered an authentic Renaissance Man. His trajectory of life was marked by the notoriety of his book published in Venice in 1494, *Summa de Arithmetica, Geometria, Proportioni et Proportionalita* (*Encyclopedia of Arithmetic, Geometry, Proportion and Proportionality*), which in its content contains a small treatise, *Particularis de Computis et Scripturis* (*About Accounts and Bookkeeping*) which contributed to the dissemination of accounting. With the elaboration of this article, we intend to clarify and demonstrate the importance of Luca Pacioli for the accounting profession.

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Keywords: Accounting. Accounting History. Accounting Books. Pacioli. Italy.

1. Introduction

This article, of an eminently informative nature, aims to present the most important aspects related to the life and work of the founder of modern accounting: Luca Pacioli (1446–7/1517). In parallel, the exhibition also aims to highlight the importance, for an accounting professional, of knowing the anchor ideas about Pacioli, namely that of being in the presence of the author who for the first time published an accounting manual in print, *De Computis et Scripturis* (*On Accounts and Bookkeeping*), a 27-page section (a treatise) included in a comprehensive mathematical work, the *Summa de Arithmetica, Geometria, Proportioni et Proportionalita* (*Collection of Arithmetic, Geometry, Proportions and Proportionality*), a 616-page book printed in Venice in 1494.

That said, the *paper* is structured into six brief sections. After this introduction, the second section lists the main characteristics of the accounting recording method that Pacioli made known in 1494: double entry bookkeeping. This section is constructed from a contemporary perspective, although it concerns topics first systematized by Pacioli in 1494 (although using different terminology). Then, the third section addresses Pacioli's most relevant bio-bibliographical features. The fourth section highlights the *Summa* and *De Computis et Scripturis*. The fifth section highlights the symbolic importance of Pacioli's

figure for accounting activity as the first promoter of double entry bookkeeping. Finally, the conclusion of the study is presented.

2. Double entry bookkeeping: main characteristics

The first use of the expression double entry bookkeeping (in a printed manual or in a legislative text), however paradoxical it may seem, is not due to Luca Pacioli's treatise, the *Summa* (1494), but rather to a work by Pierre Savonne (father) (1540–1592), a French author of Italian descent, who, in 1567, published in Antwerp an account book entitled *Instruction et Manière de Tenir Livres de Raison ou de Comptes par Parties Doubles* (*Instruction and Manner of Keeping Books of Ledger or Double-Entry Accounts*) (González Ferrando, 2014). Luca Pacioli only mentions in *De Computis et Scripturis* that he will make readers aware of the Venice method (“ *il moda di Vinegia* ”, in his exact terms); the author does not spell or convey the expression double entry bookkeeping in his 1494 incunabula. That said, Table 1 condenses the six main axioms of double entry bookkeeping from a contemporary perspective.

Table 1: The six axioms of double entry bookkeeping.

#	Explanation of the axiom
1	A division in any account: the account is divided into debit and credit.
2	A separation of accounts: accounts of people (or organizations), impersonal accounts (of values, or things), capital accounts, results accounts (expense accounts and income accounts); five types of accounts, therefore. This is a complete set of accounts. The asset, liability and equity accounts (net equity) are called equity accounts and the management accounts reflect the performance (increases or decreases in equity) of the entity in a given period, increments or decreases that arise as a result of the activity and of the management exercise of that entity in pursuit of its corporate name. Basically, there is an opposition between the balance sheet accounts and the income statement accounts by nature.
3	A double recording of the same event: a recording in the debit of one account and a recording in the credit of another account (simple entry). These are antithetical records. Once the methodology of a simple entry is understood, compound entries (entry that result in the movement of two or more debit accounts or two or more credit accounts) are easily assimilated by everyone. The term <i>double entry bookkeeping</i> comes from this axiom no. 3; the system owes its name to the circumstance that each article/entry in the journal causes two records/notes to be recorded in the ledger, one as a debit to one account and the other as a credit to another account. Full and rigorous observation of the duality of records is a <i>sine qua non</i> (Roover, 1937, p. 270) of this accounting method.
4	A double record of the same event in two separate places (two different media): in the diary and in the ledger.
5	Equality between the total amount transferred by debit and the total amount transferred by credit.
6	All value amounts must be represented under the same monetary unit.

Source: Gonçalves (2019).

3. Luca Pacioli: biography and bibliography

Literature and iconography usually attribute to Jacopo de' Barbari (ca. 1440 – 1516) , a Venetian painter, the authorship of a painting representing the figure of Pacioli. Although this authorship has recently been called into question (Gonçalves, 2019), it seems unquestionable that Pacioli appears at the center of Jacopo de' Barbari's painting, as can be seen in Figure 1.

Figure 1: The Franciscan friar Luca Pacioli, in the center (1495).



Source: Google images.

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It is estimated that the painting (cf. Figure 1) was painted around 1495 (Hernández Esteve, 1994, p. 46). In its lower part, on the right, rests beneath a wooden dodecahedron, the book that allowed Pacioli to achieve universal fame as a mathematician: the *Summa*. This painting is currently located in the city of Naples at the Capodimonte National Gallery and Museum. It is an oil painting on panel.

3.1 Pacioli's main biographical traits

Luca Bartolomeu Pacioli was born in Borgo de Sansepolcro, in the Tuscany region, in Italy, in 1446 or 1447 (the year of his birth is unclear) . In the same city he learned to read and write, and possibly had Franciscan friars as teachers (Carqueja, 2011). He lived with Piero della Francesca (1415–1492), around 30 years older and his fellow countryman, who taught him the first elements of mathematics (Gonçalves and Lira, 2009). Between 1464 and 1470 he was in Venice, where he studied mathematics and worked for the merchant António Rompiasi (Gonçalves, 2019). He was also a tutor for his three children, to whom he taught arithmetic (Gonçalves and Lira, 2009). After Rompiasi's death, in 1470 Pacioli traveled to Rome, where he stayed in the house of Leon Battista Alberti (1404–1472) , architect and cleric, and with his support he studied Plato and Aristotle (Carqueja, 2011). With the death of Alberti in 1472, Pacioli entered the Order of Franciscans and between 1472 and 1475 he completed his novitiate, studying in his theology course the *trivium* (Grammar, Rhetoric and Dialectic) and the *quadrivium* (Arithmetic, Geometry, Astronomy and Music) (Carqueja, 2011). He was then professor of abacus (commercial mathematics) and university professor of mathematics at seven of the 12 Italian universities at the time: Rome, Naples, Padua, Pavia, Pisa, Bologna and Venice (Sangster, 2018a). Between 1496 and 1499, Pacioli lived in

the Duchy of Milan in close friendship with Leonardo da Vinci (1452–1519) (Gleeson–White, 2012, p. 7, p. 82; Gonçalves, 2019), as he is well known.

As mentioned, Luca Pacioli's year of birth is not documented (Carqueja, 2011; Gonçalves, 2019), although it is known that he was born between October 23, 1446 and June 19, 1447 (Sangster, 2018a, p. 4, 2018b, p. 309). As for his death, it is known that in 1978 (by Japanese professor Akira Nakanishi, 1905–2005) a record was discovered in the Convent of Santa Cruz in Florence indicating that Pacioli died on June 19, 1517 at the age of 70. years (see Nakanishi, 1979, p. 74). It is not known exactly where Pacioli died, but the literature points to three locations: Borgo de San Sepolcro, Florence or Rome (Gonçalves, 2019). In fact, it would be interesting to know, actually, where Pacioli is buried; however, the documents that could support this information were destroyed during the Napoleonic invasions of Italy at the end of the 18th century (Nakanishi, 1979).

3.2 Brief bibliographical aspects of Pacioli

Pacioli was the author of several manuscripts, some of which have not survived to date. As for printed works, the most relevant were undoubtedly the *Summa*, from 1494, and the *Divina Proportioni* (*Divine Proportion*), a mathematical work about the golden ratio (golden number) printed in 1509 in Venice (Hernández Esteve, 1994, p 38). *Divina Proportioni* had the particularity of including 60 geometric figures drawn by Leonardo da Vinci (the manuscript had been completed in Milan in 1498).

4. Pacioli's magnum opus – the *Summa de Arithmetica, Geometria, Proportioni et Proportionalita* – and his treatise (one section), *De Computis et Scripturis*

The *Summa* was printed in Venice in 1494, and shortly after Pacioli's death a second edition was printed in Toscolano (a city in northern Italy), which documents the success of the *editio princeps* (Sangster, 2007). In Portugal there are three copies of the 1494 edition in public libraries: one in the Ajuda Library, in Lisbon; another at the National Library, also in Lisbon; and another at the Porto Public Municipal Library (Gonçalves, 2019). In Spain, according to Hernández Esteve (1994, p. 239), there are six copies of the first edition of *Summa* in public libraries.

Regarding the original edition (1494), it should be noted that it did not have any page containing the title of the work; the same did not happen in the 1523 edition, as shown in Figure 2.

Figure 2 : Home page of the second edition of the *Summa* (1523).



Source : Google images.

In a panoramic view, Pacioli's *Summa* concerns a comprehensive mathematical work, as is well known. In it, the treatise *De Computis et Scripturis* has received special attention from the community of accounting historians, as it has been translated from Italian into 14 other languages. In Portugal, the reference translation of *De Computis et Sripturis* is very recent (cf. Carqueja, 2014) and unique, it should be noted. There are translations by Brazilian authors that are very difficult to access in Portugal, so this study calls for the translation made by professor Hernâni Carqueja (see Carqueja, 2014) to be the subject of greater dissemination in (and by) academia.

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The 27-page treatise *De Computis et Scripturis* is the only part of the *Summa* text that specifically refers to accounting, in this specific case double entry bookkeeping. Pacioli thus became the first promoter of double entry bookkeeping on a global scale. It consists of 36 chapters, in which Pacioli enunciated the rules, procedures, means and ways of recording merchants' accounts and bookkeeping in the Venetian way (Carqueja, 2014).

In the first chapter, Pacioli begins by mentioning that anyone wishing to dedicate themselves to commerce must meet three requirements (Pacioli, 1494, *apud* Carqueja, 2014). Therefore, they must have, above all, cash or another asset that can be easily transformed into currency; they should also know how to do math quickly; and, finally, they had to register and write down all transactions in an orderly manner (Pacioli, 1494, *apud* Carqueja, 2014). Pacioli wrote that, at the initial moment of establishing the business, the merchant should make an inventory and, subsequently, open three essential books for the organization of commercial activity: the memorial, the diary and the ledger; he also clarified that for traders with a reduced turnover, the use of the diary and ledger would be sufficient, with the memorial being, therefore, dispensable (Pacioli, 1494, *apud* Carqueja, 2014).

The memorial was book where the merchant recorded all his transactions, meticulously noting all his purchases and sales, as well as all other operations (Pacioli, 1494, *apud* Carqueja, 2014). In the diary, items should be written in the most schematic way possible – without superfluous indications – and when drafting them, the terms “By” should

be used, preceding the debited account, and “A”, preceding the credited account. ¹Pacioli only resorted to explaining simple launches (Gonçalves, 2019). In Pacioli's ledger, accounts are formatted with debits on the left and credits on the right, with separation of debits and credits on different sides of each page (Carqueja, 2011, pp. 34-35; Gonçalves, 2019), that is, *alla veneziana*. The title of the ledger accounts was indicated in a book called *the ledger alphabet*, so that they could be found more easily and quickly by the bookkeeper (Gonçalves, 2019). The treatise contains 25 examples of daybook entries (Sangster, Stoner, McCarthy, 2011) and 19 examples of ledger entries (Sangster, 2018b).

5. The symbolic importance of Luca Pacioli for an accounting professional

It is important for anyone to know their origins; Therefore, it seems relevant for a student to know the origin and founding father of their area of knowledge. This way, you will understand better and acquire a greater taste and motivation to study and dedicate yourself to the subject. With Pacioli, so-called modern accounting was founded and the truth is that even today, more than 500 years after the publication of *De Computis et Scripturis*, the accounting system described and disseminated by him is still the accounting recording method for economic entities with organized accounting. According to Pacioli, “the accounts are, in reality, nothing more than an *ad hoc arrangement* made by the trader so that their regular use provides him with constant information on all his business, so that it is easy for him to understand whether the things go well or badly” (Pacioli, 1494, *apud* Hernández Esteve, 1994 p. 45); Now, an accounting professional, by internalizing this old *Paciolian principle*, can, in a simple and effective way, convince third parties that accounting can and should be understood as an information system to support management.

On the other hand, Pacioli, in 1494, made known to the world for the first time the characteristics of double entry bookkeeping, which seems remarkable, because the mastery of these characteristics began to constitute the basis of the accountant's professional qualifications since the end of the 15th century to the present day.

6. Conclusion

The *paper* intended to clarify Luca Pacioli's important contribution to the advancement of accounting. The literature review undertaken made it possible to document the importance that Luca Pacioli had and which is still reflected today. The idea often transmitted by academics that this character was, strictly speaking, the founding father of modern accounting, became more noticeable.

the context of disseminating accounting through printed books (e.g . : , the Italian Domenico Manzoni, in 1534, or the Flemish Jan Ympyn Christoffels , in 1543. Bear in mind that it is public knowledge that this last treatise writer traveled through Portugal and Spain before writing his book).

This article thus launches the challenge for more studies to be produced in this unexplored field in Portugal on the contribution made to the development of accounting by the authors who pioneered the dissemination of double entry bookkeeping.

¹ Vlaemminck (1956, p. 133) states that it was the Italian Simón Grisogono who, in a 1609 work published in Venice, adopted the technical characteristic currently used in his diary, dropping the term “By”, imposed by Pacioli.

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**PORTUGAL, 1759: A PEDAGOGICAL NOTE ABOUT THE
FIRST ACCOUNTING SCHOOL IN EUROPE**

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ABSTRACT

The public and official teaching of Accounting was born in Portugal, in 1759. With the creation of the School of Commerce, in Lisbon, by the Marquis of Pombal, in the reign of D. José I, the country was the first to make the teaching of accounting official and since then we have never stopped teaching and learning the discipline. This study aims to publicize this notable educational institution of proven importance for the history of the accounting profession. Addressing aspects of a normative nature, that is, giving emphasis to the question of what the School of Commerce was as an entity executing its statutes, constitutes the fundamental concern of this article. Therefore, the article does not make references to positive issues regarding the real and effective consequences of the exercise and performance of the school. Therefore, a general overview of the 19 paragraphs of the statutes of the Lisbon School of Commerce is proposed.

KEYWORDS: Accounting; Accounting Education; Accounting History; Portugal; 18th century.

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1. Introduction

The Lisbon School of Commerce is a mandatory subject in the history of Portuguese Accounting from the 18th century. In fact, it was this Accounting school, founded in Lisbon in 1759, that helped train the first Portuguese accountants, in a three-year course that qualified them to carry out, among others, administrative and office management functions. one of the largest companies of the time, the monopoly trading companies founded by the main minister of D. José I (1714-1777), the Marquis of Pombal (1699-1782).

The objective of this article is, therefore, to explore the founding document of this school instruction establishment – the Statutes of the School of Commerce, published in 1759. To this end, the article is structured into four sections. After the introduction, the second section addresses the origin of the first Portuguese school establishment, the Board of Trade. Then, the third section presents the main features of the 19 paragraphs of the School of Commerce Statutes. The fourth and final section, relating to the conclusion of the text, concludes this article. One last note to mention that some passages in the *paper* respect the spelling and syntax of the time, the Portuguese 18th century.

2. Origin of the first Portuguese Accounting School

It was in the statutes of the Board of Commerce that the germ of the Lisbon School of Commerce resided. The Statutes of the Board of Commerce, dated December 12, 1756, were approved by confirmation charter dated December 16, 1756. The Board of Commerce had been founded by Pombal, on September 30, 1755, but, at the time, the Government only

created it, that is, it did not give it statutes. The Board of Commerce represented an arm of the Portuguese Government for the general coordination of the kingdom's commercial and industrial activities. Its responsibilities were very broad (registration of traders, administration of bankruptcy, administration of lighthouses, admission of clerks, creation and administration of wool factories in Covilhã, Fundão and Portalegre, among other responsibilities).

The Statutes of the Board of Commerce, a document from December 1756, as mentioned, included 20 chapters: one of these chapters was dedicated to the professional training of those who intended to pursue the profession of bookkeeper (chapter 16). Chapter 16 of the 1756 Statutes of the Board of Commerce was entitled as follows: "Of the masters of the Class of Commerce and their exercises". It was, therefore, here that the creation of an accounting school in Portugal was envisaged for the first time. With the flavor of the time, it will be convenient, we think, to transcribe it *from verb ad verbum* the following passage, instead of clarifying it *motu proprio*, as the studies by Perdigão (1949), Gonçalves (1960), Portela (1968), Silva (1970) and Carvalho (1978) did in the specialized literature.) :

Because the lack of collection of books, reduction of money, measurements and weights, intelligence of exchanges, and the other parts, which constitute a perfect Negotiante, has caused great harm to the commerce of Reynos, faith must be established by esta Junta, a CLASS [our emphasis], in which, due to the income from the fobreditas contributions [a tax of over 4% on customs duties on imported goods, created as a consequence of the Lisbon Earthquake of November 1, 1755] fe makes one prefer, or two Meftres, of the most experts, who know it, determining competent salaries and the obligations that come with such an important job.

§ In order to make it easier for people who are deprived of means for subsistence to take advantage of the wonderful lesson, they will accept twenty Affistentes, children of Business Men, and there will be them, to whom they will contribute the emolument, which they judge to be worth it. to encourage those who have means, and encourage those who lack them to live their lives; and for the good administration of the aforementioned Class, private Statutes were formed, which were made public (Statutes of the Board of Commerce, 1756 – Chapter XVI).

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3. Statutes of the Lisbon School of Commerce

However, after it was planned (December 1756), the School of Commerce was not immediately founded, as there were difficulties in finding a teacher suitably qualified to teach commercial, accounting and similar subjects. It should also not be forgotten that Lisbon had been the target of an episode that left the city devastated, the earthquake of November 1, 1755. This circumstance meant that the Government's priorities at the time were more pressing and urgent.

Be that as it may, in 1759, the statutes of the School of Commerce saw the light of day; the Commerce Class Statutes, dated April 19, 1759, were approved by confirmation charter dated May 19, 1756 (Gonçalves, 2017, 2019). The school was opened on September 1, 1759 and its first teacher was the Portuguese João Henrique de Sousa (1720-1788) (Gonçalves, Lira and Marques, 2013, 2017), born in the city of Setúbal.

The information contained in the proem of the Commerce Class Statutes is clearly enlightening. Like this:

The Board of Commerce of these Kingdoms and Dominions, having confided that the lack of formality in the distribution and order of the books of the same Commerce, is one of the first causes, and the most evident principle of decadence, and ruin of many Traders; as well as, that the ignorance of the reduction of money, of weights, of measures, and of the intelligence of exchange rates and other mercantile matters, cannot fail to cause great harm and impediment to any and all Business with foreign Nations; and seeking, as required by the obligation of his Institute, to amend this well-known deformity, he proposed to His Majesty in the tenth Chapter of the Statutes of the same Board, that fe should establish a Class, in which

*one or two Mefires preside, and fe admittiff twenty Affistants of the number, and other fupernumeraries, so that nefta publica is very important Efcola fe enfinaffem the principles necessary for any perfect businessman and by the communication of the **Italian method** [that is, double-entry accounting; our emphasis] accepted throughout Europe, no one fails to keep the books of the feu Commercio with due formality* (Statutes of the Commerce Class, 1759, proem).

Paragraphs 2 and 3 refer to the number of teachers to teach the *Class* – one or two (determination left to the consideration of the Board) and the appointment process for three years of teaching staff. The *numerus clausus* is set at 20 cash assistants in paragraph 4 of Statutes of the Commerce Class, allowing, however, an exceptional regime, or In other words, it was possible to admit supernumeraries, as long as they did not exceed 30, “*because the care of a fô Mefire, or Lente, could not involve more than five difficulties*” (Statutes of the Class of Commerce, § 4.º).

It is established by paragraph 5 that no candidate may attend school without be previously examined by the *class teacher*, with the aim of determining whether the proposer is possessing the essential skills for this purpose: ability to read, write and count (in the four basic arithmetic operations, at least). In the articles relating to paragraphs 6 and 7, it is stated that the applicants children or grandchildren of businessmen, with equal education and procedures, should be preferred for those taking the class. However, it was reserved for the Board to faculty, at the end of the first academic year of the three for each course, to take exams to renew or dismiss those who are incapable or negligent.

According to the provisions of the 8th paragraph, the appointment of a practitioner could not be granted except to the applicant who was 14 years of age. They did not stipulate *maximum* age statutes; however, in cases with many suitors, under equal circumstances, the youngest should be admitted, “*because it demonstrates the experience, which they do more able for teaching, and faith must provide more definitions for the office, and Eftudos*” (Statutes of the Class of Commerce, § 8.º).

The Commerce Class course lasted three years, “*which is the necessary time to complete dictate, know, and practice the main objects of the Eftudos defta mefma Efcola*” (Statutes of the Commerce Class, § 9.º).

In the Commerce Class, lectures should begin, in winter, at eight in the morning and end at noon and, in summer, they should begin at seven and conclude at 11, in accordance with paragraph 10. Monthly control of the attendance of class members would be the responsibility of clerks or accounting practitioners at the Board of Commerce, who would thus

study

act

as

watchdogs¹

¹ Former secretarial employees who, at the University and other educational establishments, pointed out the absences of students and teachers.

Paragraphs 11, 12, 13, 14 and 15, most relevant to the case we are dealing with here, concern the school's curriculum program or the scheme of studies to be taught in the *Class*. The Accounting program, according to Amorim (1936), proved to be quite advanced at the time. In this way, it was established that Arithmetic, as the foundation and principle of any trade, should constitute the first part of the *Class lessons*, with perfect knowledge of the four operations, as well as fractions, the rule of three and other subjects considered indispensable.

³to a complete merchant or bookkeeper. As the Statutes state, in paragraph 11:

Arithmetic, as the foundation and principle of any and all commerce, must form the first part of the lesson of the Class, limiting itself to the faithful Practitioners, regarding the common and ordinary method of the four main species, the many, and diverse modes, how much easier and faster today do they find the forms, do the reductions and multiplications, do the abbreviations of the division, and take away the proofs; once perfection has been achieved in this part, faith must finally complete the broken count, rule of three, and all the others, which are indispensable to a Merchant, or complete bookkeeper (Statutes of the Class of Commerce, § 11.º).

After these lessons, the weights and measures of the main commercial areas followed, particularly those with which Portugal conducted transactions. The study of weights and measures was very complicated, not only from country to country, but within the national territory itself, in which, with no standardization standards, even in the Portuguese provinces, different models were applied. As Cunha (1899) states, it was only at the end of the 18th century that French scholars, in this case a commission appointed by the French Academy of Sciences, made all measurements (length, surface, volume, capacity and weight) depend on a single unit, fixed, invariable and deduced from the magnitude of planet Earth – the meter ⁴.

In continuation, this Lisbon commercial academy would teach and learn the notions of exchange rates, insurance, the practice of commissions and obligations that result from them, and the formalities of charters⁵, as knowledge of arithmetic without mastery of exchange rates and insurance, it would not be enough to acquire certainty about the cost of the farms (this is to consciously evaluate the sales price).

According to Rodrigues *et al.* (2003: p. 50), “it would also be important to know solids, so that, through their dimensions, we could know the volume necessary to regulate the freight that is transported to Brazil”.

Finally, commercial bookkeeping was taught using double entry (paragraph 15), distinguishing, for this purpose, wholesale trade from retail sales.⁶ In the Commerce Class,

³ For example, arithmetic and geometric progressions, interest rule (simple and compound) and discounting operations (Rodrigues, Gomes and Craig, 2003).

⁴ The metric system was legally established in Portugal in 1852. The meter, according to the Academy's calculations, should be one ten millionth of a quarter of the earth's meridian” (Crato, 2008: p. 127). In this exact sense,

*The French Government, recognizing the great **embarrassments that the diversity of measures that existed in the different provinces of France, as was also the case among us, brought to commerce** [our emphasis] and to administration, deemed it necessary to carry out a complete reform of the system of weights and measures. To this end, extensive geodesic work was carried out, from which it was concluded that the length of the fourth part of the terrestrial meridian that passes through Paris is 5,130,740 toezas (French measurement). The ten millionth part of this length was called meter, and the metric system was adopted as the fundamental unit. All other measurements and weights are derived from the meter. The meter is, therefore, the ten millionth part of the Paris meridian (Cunha, 1899: p. 224).*

⁵ Based on Borges (1839: p. 217), charter is the “*ship's rental contract; It is done in writing, and this writing is called a charter or charter - and at its price, Freight*”.

⁶ “*Lately, they will be working on refining the method of writing books with commercial distinction in groffo, and retail sales, or by the small, all in double entry, even if with differences in the two aforementioned trades*” (Statutes of the Commerce Class, § 15.º).

attention was devoted to the books *Borrador, Diário, Razão, Auxiliares, Balance Sheets* and the exemplification of how to work in double entry (Rodrigues *et al.*, 2003).

Once the Commerce Class course has been completed, once the certificate of completion has been issued, practitioners will benefit from privileges in all appointment procedures by the Junta da Fábrica das Sedas and in all other inspections by the Board of Trade.

Sales clerks who had been working for more than five years and who had successfully attended the *Class* were given the opportunity to open stores on their own.

The statutes ended with a paternal-style recommendation that schoolchildren should be used in lessons, for their own benefit and for the business houses that took advantage of their commercial conduct.

4. Conclusion

This work presents a theoretical/practical implication for society: it aims to provide a valid study tool to increase the initial motivation of Accounting students upon entry (and attendance) at higher Accounting and Management schools. It is believed that knowledge of the accounting past, in addition to contributing to intellectual enrichment, helps to prepare and better sustain the future. It is clear that the issues relating to the teaching of Accounting and the first Portuguese school to teach it in public terms represent themes that capture the attention of Accounting students, and it could even be said that the first literature in the scope of the history of Accounting that As a rule, they dedicate consideration to the school portrayed here.

These are the foundations on which this article launches a challenge to Accounting teachers for greater dissemination and more research into the oldest Portuguese public Accounting school. Studying the history of Accounting can be very valuable and very beneficial for Accounting students, because it helps them to develop and deepen their professional identity.

Having systematized the main guidelines of the founding document of the Lisbon Commerce Class, we acquired the conviction that it was a serious thought that was the basis for the conception of the first public school of Accounting and Commerce in Portugal. However, in line with Azevedo (1961: p. 12), “more important than knowing the regulatory norms of an institution is knowing the way in which it achieves the purposes for which it was created”. The implications that this last warning suggests to us remain a recommendation for future research work in the area of the history of Portuguese Accounting.

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**RESEARCH ON THE NEGATIVE EFFECTS OF TECHNOLOGICAL
DEVELOPMENTS ON ACCOUNTING EDUCATION**

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Databases containing accounting data serve accounting information systems. Accounting professionals must use technology to provide information to meet the needs of enterprises from these data and propose solutions to possible problems. Therefore, accountants are required to meet the current demands of the public with the developing technology while performing their profession and to adapt to the current regulations made by the institutions. However, the accounting profession may face some difficulties with the change in technological applications. Technological developments such as machine learning and robotic process automation may eliminate the need for entry-level accounting employees in enterprises. Because today's technologies automate routine accounting activities and this may lead to layoffs. Considering this, it is necessary to train technologically equipped professionals who can propose solutions to possible problems and transform accounting data into meaningful information. Therefore, the accounting profession should be reshaped to respond to technological developments in processes such as the Fourth Industrial Revolution, digitalisation, artificial intelligence and e-transformation. However, it is difficult for accounting professionals to respond to innovations by teaching these developments only theoretically.

This study aims to determine the negative effects of technological developments on accounting education of accounting students. For this purpose, a face-to-face questionnaire consisting of open-ended statements was applied to the students. As a result of the study, it was determined that technological developments are realised very rapidly and students are unable to keep up with this speed. In addition, it has been determined that students are lazy in terms of research, curiosity or questioning etc. for the lessons. In addition, it was determined that students' confidence in the profession was shaken by the thought that technological developments threatened their profession.

INTRODUCTION

Databases containing accounting data serve accounting information systems. Members of the accounting profession are required to use technology in order to provide information to meet the needs of enterprises from these data and to propose solutions to possible problems. Therefore, accountants are required to meet the current demands of the public with the developing technology while performing their profession and to adapt to the current regulations made by the institutions. However, the accounting profession may face some difficulties with the change in technological applications. Technological developments such as machine learning and robotic process automation may eliminate the need for entry-level accounting employees in enterprises. Because today's technologies automate routine accounting activities and this may lead to layoffs. Therefore, it is predicted that accountants who cannot develop their professional skills may become extinct in the coming years. Considering this, it is necessary to train professional members who are technologically equipped, who can propose solutions to possible problems and who can transform accounting data into meaningful information. Therefore, the accounting profession should be reshaped to respond to technological developments in processes such as the Fourth Industrial Revolution, digitalisation, artificial intelligence and e-transformation. However, it is difficult for accounting professionals to respond to innovations by teaching these developments only theoretically.

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ACCOUNTING EDUCATION

The accounting world, which has come to a certain point with the uniform chart of accounts studies in accounting that started in the 1960s, has followed a very successful process in keeping up with the changes in technology. Especially thanks to the widespread internet network, connections between tax accounting and related institutions have been established over the internet and most of the transactions can now be handled over the internet (Güney & Kaya, 2018). Accounting can be defined as an information system that reveals the resource formation of enterprises, the way of investing in these resources, the changes (increases or decreases) in resources as a result of their activities, and the information that explains the financial status of the enterprise and directs them to the relevant parties. According to the accounting theory, at least three building blocks are needed to create such a system. These are input, process and output (Erkan, et al., 2014).

The Accounting Education Change Commission within the American Accounting Association states that the main purpose of accounting education today is to teach students to learn how to learn instead of transferring knowledge with traditional methods. In order for what is learnt in accounting courses to be permanent and to be transferred to practice, modern teaching techniques should be used in addition to traditional teaching methods (Ertan et al., 2014).

Today, there is a need to establish a certain standard in accounting education in order to progress on a global scale. For this reason, the International Accounting Education Standards Board was established by the International Federation of Accountants. The first four of the standards set forth by this board were prepared for the education of professional candidates, the others for post-education, and the eighth standard for auditing. Structuring the eight standards, which have an international dimension, in our education system will make a great contribution to our country's development. In line with such a structuring, a common accounting language will be established in global markets thanks to international accounting education standards in the education system of our country. At the same time, the education content will be continuously renewable for the continuity of accreditation and vocational education (Tazegül & Karabayır, 2015).

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The digitalisation process in education has brought innovations. Educators have turned to digital student-centred practices in teaching strategies in order to meet the expectations of students. This transformation of learning processes has also changed the role of the teacher and directed him/her to the role of a counsellor and guide for the student. Digital transformation in education has provided a transition away from teacher-centred classroom environments in which the behaviourist approach is adopted and towards student-centred learning environments in which the constructivist approach is adopted. With the development of technologies, content aiming to direct technology such as virtual and augmented reality applications, gamification applications, artificial intelligence, robotic coding have started to be integrated into education. The reason for this is the need to train people who are equipped to meet the needs of the future, which is the main mission of education. 21st century learners should be innovative, creative, solution-oriented, highly motivated, highly communicative, and have cognitive skills such as technology and information literacy, problem solving and critical thinking (Robertson, 2020, 265).

NEGATIVE ASPECTS OF ARTIFICIAL INTELLIGENCE AND ACCOUNTING EDUCATION

The fact that artificial intelligence is a comprehensive concept and there is no clear agreement on its definition makes it difficult to define. Artificial intelligence is the simulation of human intelligence with machines. It is a system that deals with how computers or machines can perform tasks that can only be performed intelligently by humans. Artificial intelligence is systems or machines that can imitate human intelligence in order to perform the tasks assigned to them and can continuously improve themselves in the light of the information they obtain. Artificial intelligence is not an embodied model or function. It is about the ability to analyse empowered ideas and data. Artificial intelligence, which is a highly valuable commercial asset designed to improve human capabilities and increase their contributions, is not robots prepared to replace humans as thought (Demirdöğmez, 2022).

The main disadvantage of artificial intelligence-based applications is the acquisition cost of these applications. Moreover, it is necessary to add installation, maintenance and repair costs as well as the costs of updating the software in the process to these costs. On the other hand, if the applications in question depend on outsourcing, the subscription "membership" fees to be paid to the relevant software developer and/or manufacturer also constitute an important item (Mil and Dirican, 2018).

Artificial intelligence will become one of the important technological skills of the 21st century with its potential. For this reason, increasing the artificial intelligence skills of people who do not work on artificial intelligence; it becomes very important for them to communicate effectively in a world where artificial intelligence technologies take place in the future, to keep up with changing technology, to benefit from the advantages of artificial intelligence and to avoid its disadvantages. At this point, the concept of artificial intelligence literacy refers to the skill set necessary for people to use artificial intelligence technologies effectively and ethically. The emergence of artificial intelligence technology has made the concept of AI literacy necessary to define the competences of people to use this technology. As with any other technology, the potential uses and abuses of AI go hand in hand with its destructive capacity. Therefore, artificial intelligence literacy becomes an important and strategic issue in order to eliminate the possible dangers of artificial intelligence applications and to use them beneficially (Çelebi, Demir, Karakuş, 2023).

It can be said that the selection of employees with artificial intelligence has some disadvantages as well as advantages. Artificial intelligence algorithms are open to be directed in line with employee preferences. For example, if the algorithm is configured predominantly for male candidates, the recruitment preference will be for men. Or sometimes, if the configuration supports racism, in such cases, the algorithm may make a biased choice (Dastin, 2018).

Artificial intelligence systems may make unfair decisions due to social and economic discrimination or prejudice against something or someone. In fact, it is known that humans are biased in their decision-making. Since artificial intelligence systems are also designed by humans, it is possible for humans to transfer their biases to them, even in an unintended way. Many existing artificial intelligence systems are based on machine learning data-driven techniques. Therefore, a dominant way of transferring bias can be the collection and selection of training data. If the training data is not sufficiently inclusive and balanced, the system may learn to make unfair judgements. At the same time, artificial intelligence can help people identify their biases and make less biased decisions (Eltimur, 2022). With the integration of innovations in artificial intelligence with the business organisation, risks may also arise in the accounting system. One of these risks, information security, can be expressed as the capture of accounting information by malicious third parties. Giving access to accounting data to unauthorised persons or unethical behaviours may result in the alteration of accounting records and this may reduce the reliability of financial statements (Kaya, 2018).

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NEGATIVE ASPECTS OF BLOCKCHAIN AND ACCOUNTING EDUCATION

The history of Blockchain is actually older than known. It was first mentioned in 1976 and its foundations were laid in the 1990s. Each block holding information in the blockchain is encrypted and contains the summary information of the previous block. In this way, it is based on the idea that each block is connected to the previous block, thus creating a block chain and keeping it in a decentralised structure by keeping copies of this chain on a large number of machines. Since each block in this chain holds summary information about the previous block, the validity of the chain is broken when a new block is added, and the block cannot be deleted from the chain. If you want to change the chain maliciously, in order for it to be valid, 51% of the machines in the system must be changed at the same time, which is very difficult and requires a large cost. Keeping information on a large number of machines makes it much more reliable than systems where all the data is in a single centre (Ehram, 1976).

Blockchain is essentially an encrypted digital store of information and data. Blockchain has the style of a decentralised and distributed computer network. Therefore, being hosted on a distributed system network can allow secure transactions to take place on a blockchain with little possibility of fraud. Blockchain can allow taxpayers to track their transactions between peers. Blockchain, which is characterised as a form or sub-title of distributed ledger technology, is a method of recording and comparing data between many data ledgers, all of whose data stores have the same information data (Houben and Snyers, 2018). Blockchain technology is still a very new technology, so unforeseen software errors and vulnerabilities invite cyber-attacks. As a result, serious economic losses can be experienced. Continuous update work is carried out on the platforms to eliminate errors, close vulnerabilities and add innovations. These updates require each endpoint to act together, but in case of any disagreement, it may cause problems called "bifurcation" (Demirdöğmez, 2022,).

Although consensus algorithms have been extensively studied, the weaknesses of the consensus algorithms still remain. For example, the PoW algorithm is inefficient in mining operations, while the PoS algorithm does not perform sufficiently in the transaction confirmation phase (Liu, et al., 2019). The fact that it is still in the early stages of development, there are still serious debates about the robustness and flexibility of blockchain technology, there is a lack of hardware and software in sufficient standards for large volume transactions, and there is a lack of qualified and skilled professional people. Blockchain technology continues to develop products in many countries, organisations and companies. At the same time, the lack of qualified personnel with Blockchain technical skills is an obstacle to the full functioning of the system (Akıncı and Kaya, 2022). Due to the ever-increasing exchange of sensitive data, the security of big data is becoming very important. Concerns about this issue stem from the fact that traditional security measures are not sufficient to prevent these risks despite the emergence of new threats to information security. In particular, Apache Hadoop based on Kerberos, which is known to have significant vulnerabilities related to existing authentication protocols, contains many security threats such as attack attacks, SSoD and single point of failure (Abdullah et al., 2017).

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CLOUD TECHNOLOGY AND NEGATIVE ASPECTS OF ACCOUNTING EDUCATION

The cloud is a computing network that includes data centres formed by the combination of a large number of computers, allowing users to access resources over the internet. Companies offering cloud services allow access to their systems through their own web platforms. The

concept of cloud computing comes into play at this point. The systems that companies offer to users enable the distribution of resources and processing on information, which is called cloud computing (Eren, 2017). Cloud computing is the provision of an information technology infrastructure (hardware, software, data storage, application, service, security, etc.), which is geographically located in a specific location or dispersed, to the user over general networks such as local networks or the internet. In other words, a person who will use the cloud system, in principle, only needs a powerful hardware (smart mobile phone, tablet, computer, laptop or desktop computer, etc.) to connect to the local network or internet that provides this service. Everything else - background calculations, storage of data, development or running of applications, security services, etc. - takes place in a server "cloud" thousands or even tens of thousands of kilometres away. From this point of view, cloud computing is not a product but a service (Ege, 2012).

By highlighting the spatial feature of Cloud Computing, it is defined as a data centre consisting of software and hardware. According to the definition that focuses on the hardware resources of Cloud Computing as a service, it is a technology that enables businesses to access their own infrastructure over the internet (Armbrust et al., 2010,). Cloud computing applications can be defined as web-based services where the desired information is stored through virtual servers and thus the information stored can be accessed at any place and time where the internet can be used. Cloud computing applications allow accounting activities to be organised instantaneously by further developing the software programmes used in accounting. Thanks to cloud computing applications, all accounting transactions can be recorded instantly according to the electronic ledger method. Cloud computing systems are increasingly being adopted and preferred in enterprises, especially in corporate accounting systems. With the help of the virtual structure created, enterprises save costs such as investment, renewal, infrastructure and management (Malik et al., 2018).

Inexperienced Cloud Operator Since cloud computing systems are accessed over the internet, a continuous internet connection is required. For this reason, accessing with low internet speed causes applications to run slowly. Although security is provided by professional teams, a small mistake can cause great damage. When the cloud infrastructure is updated, the application on this infrastructure may not work properly (Dokuz and Çelik, 2017). One of the most important disadvantages of Cloud Computing services is how to protect personal or company-specific and confidential data shared with service providers from other service users in the cloud and how to ensure data confidentiality. The level of data privacy provided

in the cloud is often lower than that of personal computer users and makes users uneasy. Because traditional security methods do not work well in the cloud. As in the traditional method, service providers cannot allow their customers to direct the security settings. If they do, a client can illegally change the security settings in its own favour, and it will be possible for other malicious clients to change the security settings. Therefore, it is unacceptable for cloud providers to allow customers to manage the security settings of their own computing environment (Delaney and Vara, 2007).

NEGATIVE ASPECTS OF BIODATA AND ACCOUNTING EDUCATION

Big data, or "big data" or "giant data" in Turkish, is a relatively new field of study both academically and industry-wide. The term "big data" is used for data that is too large to fit on a single server, too unstructured to fit into row-column databases, or too continuously flowing to fit into a static data warehouse. While all the attention has been directed at the size of the data, the most challenging aspect of big data is that it lacks a structured form. In other words, the data in question points to a pile rather than a ready-to-use data. Data is structured or tried to be structured according to the need. To summarise; the term big in big data gains importance with how it is interpreted and utilised rather than its volumetric emphasis (Davenport., 2014).

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Accounting records transactions and events of financial nature expressed in money. Although these records have historically been physical records, today they are almost completely digitalised. For example, while 25 per cent of all information stored in 2000 was digital, today it is stated that more than 98 per cent of this information is electronic. It is stated that organisations have collected much more data in the last two years than the data collected in the past 2000 years (Warren et al., 2015). Big data is a field mostly related to the analysis, storage and processing of large amounts of data obtained from different data sources. Big data solutions and applications should be unique, that is, they should have a unique structure. Traditional processes, techniques and storage technologies of data analysis do not provide the required competence. Big data refers to different needs such as combining multiple unrelated data sets, processing large amounts of unstructured data and collecting confidential information in a limited time (Akbulut, 2021).

If Big Data cannot be controlled, it is inevitable that there will be a decrease in the speed of accuracy in short-term decisions as a result of the loss of both time and information acquisition advantage as a result of getting lost in the data stack. Therefore, in order to avoid

such problems, maximum attention should be paid to the three states of data: volume, speed and variability. In today's applications, the concept of Big Data has been orientated only towards volume by removing dimensions such as speed and variability, and the desired success has not been achieved (Davutoğlu, 2022). From another point of view, the existing data sources or system algorithms, i.e. the resources required for big data, are not established to create quality research data, but for different purposes. Since the engineering or programming changes of the software created in this way are caused by human behaviour, changes and deviations can often occur in the data. This causes doubts about the reliability of the data (Lazer et al., 2014).

The limited scope of the data is also seen as an important problem. Researchers often need large data sets, but the data sets have only a certain set of variables. In order to solve these problems, it is necessary to increase data capability and to increase the number of measurement systems that perceive the real world. In this way, researchers will be able to become aware of the facts behind behaviours and attitudes and create more accurate decision-making mechanisms (Link, 2018).

LITERATURE REVIEW

In his study, Komieczna (2020) conducted a research with CAWI survey method on 123 students studying in economics programmes in Poland, especially accounting students and graduates born between 1990-2000. The results obtained showed that students prefer less secure web-based information rather than reliable legislation and literature review while learning accounting subject. Watson et al. (2007), based on the articles they reviewed, report that there has been some progress, for example, in the use of active learning techniques and the emphasis on communication skills; they also point out that students seem to be satisfied with their training with realistic simulations, which leads to a greater ability to assess risk, to apply professional standards and to be more confident in the results obtained.

Erduru, et al. (2017), the most important finding obtained in this research on determining the thoughts of students studying accounting education about the accounting profession, the reasons for choosing the profession, their perspectives on the profession and the change of these perspectives according to demographic factors is the undecided attitudes towards the propositions thought to be caused by the students' lack of knowledge about the profession. Smith (2018) comparatively examined the current research in the field of blockchain and accounting and how this technology will potentially affect the accounting profession and how

the process will be changed. It is stated that blockchain technology will enable the creation and implementation of a healthy internal control system in enterprises and that enterprises will be able to achieve successful results in line with their strategic goals in the medium and long term.

Geiger and Ogilby (2000) examined the perceptions of two groups of students who take accounting as a basic course and two groups of students who take this course as an elective course and how these perceptions are related to the choice of accounting course. This study showed that although accounting majors perceived the course more favourably than non-accounting majors, in general, both groups of students perceived the basic accounting course quite well in various dimensions. However, it was observed that both accounting departments and non-accounting departments' perception of the introductory course given at the beginning of the semester decreased compared to the beginning of the semester. Yüksel (2019) examined the effect of accounting students' acquisition of skills to adapt to technological developments in the accounting profession on their career plans. As a result of the study, it was revealed that students' ability to use technology and adapt to digitalisation in the accounting profession is important, and there is a positive relationship between students' career plan and technology competence.

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McPeak et al. (2012), in their study, aimed to provide information about the International Accounting Education Standards Board and International Accounting Education Standards. The published Standards were analysed one by one and simplified for the reader to have information. In order for the standards to be more effective and useful, accounting educators should contribute to the draft texts, publish in the areas determined by the International Accounting Education Standards Board and take a more active role in the standard setting process. Hurt (2010) made some suggestions to increase the desire of accounting students to work in the field of accounting. He stated that career planning and evaluation experts and expert managers in the field of accounting should be invited to the first accounting courses to give more detailed information about the field of accounting to the students, and on the other hand, students should participate in meetings and such activities related to the field of accounting. He suggested that the preliminary career plan to be created for each student in the last year of education will guide the future plans of the students and will form the basis for professional opportunities throughout the university education.

Abhayawansa, et al. (2012) examined the effect of learning experience on students' approaches to learning. The results showed that learning experiences did not deter the

professional orientation of accounting students because the learning environment that students were exposed to in the university environment was not constrained by academic orientation. However, it was noted that there was a greater adoption of strategy attainment by these students, extra effort in relation to assessments and subject content. This study revealed the need for university lecturers and tutors to adopt an inclusive approach that recognises differences in prior learning experiences and consequently provides additional support and guidance. Finally, the study supported the 'transition model' aiming to increase access to higher education.

METODOLOGY

This study was carried out to determine the negative aspects of technological developments in accounting education of the students studying at Diyarbakır Social Sciences Angel School. The main mass of the research consists of accounting and tax department and business administration students who have taken accounting courses at Diyarbakır Angel School of Social Sciences.

A face-to-face questionnaire was applied to 100 students determined in accordance with the scope of the research. Since 5 questionnaires were incomplete or incorrectly filled, 95 questionnaires were included in the study. The women participating in the study were asked 4 demographic and 11 statements determined within the scope of the research. The answers given by the students participating in the study were presented in tables and the related study was analysed. The results were presented in tables and comments were made.

FINDINGS

Within the scope of the study, the data obtained by using the face-to-face questionnaire application to the participants were analysed and interpreted.

Table 1. Descriptive Statistics Related to Demographic Characteristics

<i>Demographic Characteristics</i>		n	%
Age	19 years and under	63	63
	20 years and over	32	37
	Total	95	100,0
Classroom	1st Class	55	58
	2nd Class	40	42
	Total	95	100,0
Section	Accounting	58	61
	Business	37	39
	Total	95	100,0
Gender	Female	59	62
	Male	36	38
	Total	95	100,0

Table 1 gives information about the demographic characteristics of the participants. Of the students participating in the study, 63% were 19 years of age or younger and 37% were 20 years of age or older. 58% of the students participating in the study are first year students and the rest are second year students. While 61% of the participants are studying in the department of accounting, 42% are studying in the department of business administration. Of the students participating in the study, 62% are female and 38% are male.

Table 2. Descriptive Statistics Related to Study Statements

<i>Statements</i>	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Undecided</i>	<i>I agree</i>	<i>Strongly Agree</i>
With the development of technology, the skills acquired in traditional accounting education are decreasing.	2 (%2.1)	10 (%10.5)	8 (%8.4)	25 (%26.3)	50 (%52.6)
Developing artificial intelligence and automation technologies will cause the disappearance of the accounting profession and accounting education is becoming inadequate.	0	0	0	20 (%21.1)	75 (%78.9)
With the development of technology, it is easier for students to have artificial intelligence or similar technological tools do the homework given at school rather than doing it individually.	0	0	1 (%1.1)	16 (%16.8)	78 (%82.1)
The widespread use of technology in accounting education raises information security and privacy concerns.	0	0	2 (%2.1)	20 (%21.1)	73 (%76.8)
Excessive use of technology in accounting education increases dependence on technology.	2 (%2.1)	3 (%3.2)	5 (%5.3)	25 (%26.3)	60 (%63.2)
In technology-oriented education, personal interaction and communication between teachers and students are reduced.	0	5 (%5.3)	12 (%12.6)	35 (%36.8)	43 (%)
Technology-oriented accounting education often causes students to be inadequate in developing personal communication skills.	8 (%8.4)	12 (%12.6)	18 (%18.9)	30 (%31.6)	27 (%28.4)
Emphasising technology in accounting education leads students to move away from real world experiences.	3 (%3.2)	3 (%3.2)	15 (%15.8)	35 (%36.8)	39 (%42.1)
One of the biggest obstacles to the use of technology in schools in accounting education is not having sufficient technological equipment.	0	0	3 (%3.2)	22 (%23.2)	70 (%73.7)
Although technological developments and innovations necessitate transformation in accounting education and practices, training programmes are inadequate.	0	0	10 (%10.5)	20 (%21.1)	65 (%68.4)
It suggests that instead of listening to the lessons at school due to technological tools, they prefer to listen to them later by using these tools.	2 (%2.1)	1 (%1.1)	20 (%21.1)	25 (%26.3)	47 (%49.5)

Table 2 shows the statements directed to the students participating in the research. When Table 2 is taken into consideration, it is seen that there is a high level of participation in the study statements in general. It is seen that all statements were marked on the scale of agree or strongly agree. In addition, almost all of the statements were not marked on the scale of strongly disagree and disagree. The statement "With the development of technology, it is easier for students to have artificial intelligence or similar technological tools do the homework given at school rather than doing it individually." has the highest rate among the

participant students. The second statement is "Developing artificial intelligence and automation technologies will lead to the disappearance of the accounting profession, so accounting education is becoming inadequate." The lowest rate of participation of the participant students in the study statements was the statement "Technology-oriented accounting education generally causes students to be insufficient in developing personal communication skills."

CONCLUSION

With the use of technology, students may miss the opportunity to acquire some basic accounting skills. For example, instead of directly applying basic accounting procedures such as manual calculations and trial balances, they may have to use software that automates these procedures. This may prevent students from fully understanding and applying basic accounting principles. Developing artificial intelligence and automation technologies have made it possible to perform some accounting transactions without human intervention. This may lead to the rise of automation that may replace humans in the accounting profession and may cause students in accounting education to have concerns about future employment opportunities.

The widespread use of technology in accounting education can raise information security and privacy concerns. Especially when working with students' personal and financial information, securing and protecting the confidentiality of this information becomes even more important. Misuse or malicious attacks with technology tools can increase these concerns. Overuse of technology in accounting education may increase students' dependence on technology. This may cause students to rely too much on automation tools and ignore fundamental concepts instead of gaining an in-depth understanding of accounting topics. In technology-oriented education, personal interaction and communication between teachers and students may decrease. This may be disadvantageous for understanding and learning complex subjects such as accounting. It is possible that students may not get quick and direct answers to their questions or lack opportunities for in-depth discussion.

In short, the development of technology requires revision in the curriculum of accounting education. In addition, it is thought that students become lazy as a result of using technological tools and experience deficiencies in the acquisition of basic skills in accounting education.

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RESEARCH ON THE REASONS WHY WOMEN PREFER E-COMMERCE

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Abstract

While the Internet was used for basic transactions such as accessing information, communicating and sending e-mails in the first years of its existence and development, the discovery and availability of the necessary technologies for the future has revealed new ways of doing business for businesses. Considering the advantages offered by the Internet to consumers, it is very important that the purchasing process can be carried out at any time, especially over the Internet, and this situation brings a significant saving in terms of time. Issues such as what motivates consumers to buy, which factors are more effective as a trigger to purchase or what deters consumers from buying and which factors arouse distrust in consumers against online purchasing should be considered in depth by companies.

The aim of this study is to investigate the reasons why female consumers prefer e-commerce. For this purpose, a face-to-face survey was conducted on 3500 female participants. As a result of the research, it was concluded that the concept of convenience as a feature of the temporal and spatial independence of the Internet is an important factor affecting the online purchasing behaviour of female consumers. In addition, factors related to convenience such as the ability to perform online shopping at any time of the day, payment at the door, home delivery options, access to more product types and options, time saving and the opportunity to purchase products at more competitive and lower prices compared to in-store prices positively affect the online purchase intentions of female consumers. In addition, female consumers prefer e-commerce because the design of the website is user-friendly, does not contain confusing elements, and the shopping procedure is simple and safe. However, as a

result of factors such as privacy concerns, distrust in credit card payments, return procedures and buying without touching or examining the product, female consumers move away from online purchasing behaviour.

INTRADUCTION

Internet technology has developed at a remarkable pace, especially in the early 2000s. In parallel with this development, the Internet has gained an important place in the lives of individuals and businesses. While the Internet was used for basic transactions such as accessing information, communicating and sending e-mails in the first years of its existence and development, the discovery and availability of the necessary technologies for the future has revealed new ways of doing business for businesses. For consumers, it has become a new medium that can be used for various purposes such as education, socialising and shopping.

The rapid development of globalisation and communication systems means the disappearance of geographical borders and the emergence of a new economic system. With this new system, the concept of distance in the business world has completely disappeared. Especially considering that the use of the internet is increasing day by day, every market in the world has become a potential market for business. In this environment, companies are no longer restricted by geographical boundaries and can use communication and information technologies to carry out all their commercial activities. As a result, companies gain a number of advantages such as competitive advantage, wide customer opportunities, reduced costs and two-way communication.

Considering the advantages offered by the Internet to consumers, it is very important that the purchasing process can be carried out at any time, especially over the Internet, and this situation brings a significant saving in terms of time. In addition, there are many advantages such as a wide range of products, competitive prices, home delivery and convenience. However, in addition to these advantages, some female consumers still have concerns about online shopping. As a result of factors such as privacy concerns, distrust of credit card payments, return procedures and buying without touching or examining the product, female consumers are moving away from online purchasing behaviour.

Companies that want to survive in the electronic environment need to know what consumers experience and how they are affected before, during and after online shopping. Issues such as

what motivates consumers to buy, which factors are more effective as purchase triggers or what deters consumers from buying, and which factors arouse distrust in consumers against online purchasing should be considered in depth by companies. Strategies that address both the factors that encourage consumers to purchase and the factors that negatively affect their purchasing behaviour can enable them to interact with consumers in the right way.

E-COMMERCE CONCEPT AND IMPORTANCE

The term trade conceptually refers to buying and selling activities carried out for profit. Trade has taken many forms throughout history and has developed over time to take its current form. Electronic commerce is defined as the whole of economic transactions in which the parties can communicate and aim to create value without the need for physical exchange through processing and transmission (Erdağ & Batuman, 2006).

E-commerce has led to cost savings for businesses. Costs associated with the pricing of goods, labour requirements and human error are minimised. As a result of selling goods electronically, sales data are collected more systematically, providing companies with information on the demand for goods. Inventory management is also simplified and inefficiencies in the supply chain are minimised. Companies that exist in an environment where the target audience is present can reach consumers in the target audience more easily.

The fact that enterprises have insufficient infrastructure in technology, financing and legal issues related to e-commerce, consumer prejudice and mistrust in e-commerce constitute obstacles for enterprises. Another disadvantage is that the legislation on e-commerce is still unclear and companies do not know how to act in this situation. Although companies have taken the necessary security measures for e-commerce, security vulnerabilities can put them in a difficult situation. This can lead to irreparable losses for consumers and businesses. Problems may arise in the packaging and loading-unloading process during the delivery of difficult and strange goods to consumers. Such goods require special solutions. The inaccessibility of internet access, which is necessary for the realisation of e-commerce, to the whole society for economic reasons causes the loss of potential customers.

In today's world where the concept of time is very important, e-commerce allows consumers to save time. It provides the opportunity to find and buy the product they want in a few steps without having to visit dozens of stores or queue for the product they want. As a business,

you can open up to other markets and reach more people. There are no overhead costs such as inventory and labour costs. You can always have an open store with less cost. E-commerce offers fast sales and is easy to manage. The variety of products offered in e-commerce has made it easier for consumers to find the most suitable products for their budgets and the features they are looking for. Thousands of product options appear in front of consumers at the same time. Consumers can compare them according to the functions that are important to them (price, performance, etc.).

E-commerce offers many conveniences for both businesses and customers who prefer it. It provides stores open 24 hours a day, 7 days a week, easier access to new distributors and suppliers, improved supply chain management, opportunities to enter global markets, potential for global recognition, expanded geographical coverage, reduced overall operating costs and reduced communication costs. It provides fast delivery of products, allows us to choose the transport company we want, creates employment opportunities, provides special videos about the product, provides information about technical specifications.

Of the many reasons underlying the increasing number of people who prefer e-commerce, five are particularly noteworthy;

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Price advantage: the operating costs of e-commerce sites are generally lower than those of physical stores. In addition, since their sales area is not limited to the physical destination of the store, they have the advantage of being able to sell in larger volumes and supply larger quantities of products at more favourable costs. For these reasons, e-commerce sites can offer products to consumers with the highest possible price advantage. *Product diversity:* One of the most important constraints of a physical store is shelf space. No matter how big the store is, the products it can offer are limited to the shelves it can display. However, e-commerce sites have unlimited shelf space and therefore can offer consumers a very wide choice.

Shopping from home: Shopping is also a social act, but in many cases it is a great convenience for consumers to be able to shop without having to go to a store. This is especially true on weekends and special occasions; it is a great advantage to be able to order online with just a few clicks instead of queuing in crowded stores. *User reviews:* Let's say you want to buy a TV, but you have no idea which one you want. The best option in a physical store is the recommendation of the store owner who can help you. In online shopping, other users' reviews can help you choose the right product for you. *Privacy:* Shopping in stores involves face-to-face communication with the seller as well as other

customers. However, consumers may prefer to be alone when purchasing goods. Online shopping offers advantages that physical stores do not offer in terms of privacy. In e-commerce, consumers have the chance to choose the most suitable one among many alternative payment methods (Gökgül, 2014; Arslan, 2014; To, Liao & Lin, 2007).

Consumers are concerned about privacy and security in e-commerce. Consumers fear that their personal information may be shared with others or that the credit card details they provide at checkout may be stolen. E-commerce may not allow for comprehensive shopping, especially as it requires specialised websites. Consumers' expectations to buy electronically without seeing or trying products can sometimes lead to disappointment. Inadequate product descriptions and product photos that do not adequately reflect the product are other reasons why e-commerce is not preferred by consumers. In some cases, the supply period of goods purchased through e-commerce is long. Consumers who want to use the purchased goods immediately do not want to wait for cargo.

Some consumers want to have a shopping experience that makes them feel special, especially when purchasing luxury goods and services. For this reason, they are distant from e-commerce. Consumers are afraid of not being able to find an interlocutor when a problem arises during or after shopping that does not take place in a physical environment. The concept of bargaining during shopping, which is widely established in some cultures, is not valid in e-commerce. Due to frequent cases of fraud in e-commerce, people are especially distant from new e-commerce sites. In some cases, problems arising from e-commerce sites such as selling goods that are not in stock, sending the wrong goods, overdrawing credit cards or sending goods to the wrong address leave consumers in a difficult situation. Delays sometimes occur for companies and banks as intermediaries for the return of returned goods.

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WOMEN'S E-COMMERCE BEHAVIOURS

Since the products sold in the early days of e-commerce were generally of interest to men, well-educated male consumers with a certain income were the first to start e-commerce. However, later on, as the Internet became an integral part of life, women's economic power increased, their roles in society changed and expanded, and the range of products for women increased, women also started to participate in online shopping (Levy & Weitz, 2004).

In the early days of e-commerce, online shopping was dominated by technical products such as computers and software. This increased the dominance of men in e-commerce. Thanks to the development of technology, e-commerce has gained dimension. Today, there is nothing

left that is not sold in e-commerce. This situation has directed women to the electronic environment. As the attractiveness of the e-environment increased, women's interest increased even more. The fact that electronic shopping is cheaper, saves time, offers more variety and does not cause physical fatigue increases market dominance day by day. In the past, the typical profile of online consumers was that of well-educated, high-income male consumers, but the number of young people and women is increasing every day. As online shopping has become a part of daily life and the number of products for women has increased, it is seen that female consumers are also using online shopping and their numbers are increasing. In addition, online consumers are shifting towards the middle class retail consumer profile and their education levels are approaching the general average (Oyan 2010).

The entry of women into business life, changing consumption habits and rapid changes in technology trigger the increase in e-shopping. As more women have financial freedom, their use of computer technology increases. Women have become more computer and internet savvy. Women who surf the Internet do more research. These women have eliminated male dominance in e-shopping. Women's interest in online shopping is constantly increasing and they benefit from internet technology from the products they buy to the places they go. In the purchasing decision process, women need more information about products in order to make good choices. In this context, women set higher barriers than men in their purchasing decisions and therefore seek the best possible result. In the eyes of men, a good result is enough. For this reason, female consumers do more research than male consumers before making a purchase decision (Albar & Duman, 2011).

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Especially women consider more product options and the convenience of shopping from home as the most important advantages of online shopping; in a study conducted by Korgaonkar and Wolin (2003), men are more likely to use the Internet. However, in a study conducted by Sebastianelli, Tamimi and Rajan in 2008, they stated that the difference between genders in internet use is gradually narrowing and that even when men surf the internet and search for products, women are more likely to purchase after the search. Analyses of responses to demographic questions showed that there were differences in the types of products purchased by gender. Women are more likely to purchase accessories, clothing and cosmetics, while men are more likely to purchase electrical household appliances (Uzel, Aydoğdu, 2010).

According to Global Web Index Turkey (2012), the most common activity on the Internet for women aged 24-34 is research. According to the research, women are the group who do the

most research on the Internet and analyse products with a focus on purchasing. When we look at the products that women research the most on the Internet, clothes take the first place. This is followed by shoes and books. According to the research, Turkish women access the internet from their mobile phones and this rate is increasing day by day (Köprülü & Turhan, 2021).

METODOLOGY

This study was conducted to determine the reasons for women residing in Diyarbakır province to choose e-commerce and the status of choosing e-commerce according to demographic characteristics. The main population of the study consists of women in Diyarbakır province. Face-to-face survey application was carried out to 4000 female participants determined in accordance with the scope of the research. The women participating in the study were asked 23 statements and 8 descriptive questions determined within the scope of the study. The answers given by the women participating in the study were presented in tables and the relevant study was analysed. The results were presented in tables and comments were made.

FINDINGS

Within the scope of the study, the data obtained by using the face-to-face questionnaire application to the participants were analysed and interpreted.

Table 1. Descriptive Statistics Related to Demographic Characteristics

<i>Demographic Characteristics</i>		n	%
<i>Marital Status</i>	Single	950	27,1
	Married	2550	72,9
	Total	3500	100,0
<i>Age</i>	25 years and under	200	5,7
	26-33 years	900	25,7
	34-41 years	700	20,0
	42-49 years	1100	31,4
	50 years and over	600	17,1
	Total	3500	100,0
<i>Education Status</i>	High School	800	22,9
	Licence	2150	61,4
	Postgraduate	550	15,7
	Total	3500	100,0
<i>Occupation Status</i>	Private	200	5,7
	Public	1600	45,7
	Student	350	10,0
	Retired	200	5,7
	Housewife	300	8,6
	Other	850	24,3
	Total	3500	100,0
<i>Income Status</i>	10.000 TL and under	1150	32,9
	10.000 TL and above	2350	67,1
	Total	3500	100,0
<i>Internet Usage Level</i>	Beginning	400	11,4

	Medium level	2150	61,4
	Advanced level	950	27,1
	Total	3500	100,0
<i>Internet Usage Time</i>	Less than 1 hour	550	15,7
	1-2 hour	900	25,7
	2-3 hour	1250	35,7
	3-4 hour	600	17,1
	More than 4 hours	200	5,7
	Total	3500	100,0
<i>Shopping Frequency</i>	Daily	900	25,7
	Weekly	1430	40,9
	Monthly	1170	33,4
	Total	3500	100,0

Table 1 gives information about the demographic characteristics of the participants. It was determined that the majority of the participants were married women. It is seen that 3/1 of the female participants have undergraduate education. It has been determined that the majority of the participants work in the public sector. In parallel with this information, it was determined that the majority of the participants had a monthly income of over 10.000TL. It was determined that the internet usage level of the majority of the women participating in the research was at medium level. It was determined that 3/1 of the participants spent 2-3 hours a day on the internet. It was determined that approximately half of the participants shop online at least once a week.

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Table 2. Descriptive Statistics Related to Study Statements

<i>Statements</i>	<i>mean</i>	<i>Std. Dev.</i>
I can find the same product cheaper during the online shopping process.	4.500	0,500
I can reach the products that I cannot reach in my location through e-shopping.	4.557	0.525
In the process of shopping on the Internet, credit card transactions can be made very easily.	4.200	0.804
It is easy to find an interlocutor in the delivery process of products purchased over the Internet.	3.887	0.838
E-shopping products are returned.	4.528	0.579
Online shopping can be done at any time.	4.700	0.517
I think online shopping is a good idea.	4.357	0.698
Online shopping provides ease of payment at the door.	4.571	0.600
Online shopping saves time.	4.271	0.675
I think online shopping is a wise move.	4.513	0.580
Online shopping provides convenience in home delivery.	4.642	0.508
There is a wide variety of products in online shopping.	4.414	0.538
I would consider shopping online.	4.128	0.861
Comments in online shopping affect my decision on the product I will buy.	3.785	0.985
The information on the website about the product is sufficient.	3.928	0.651
Online transactions are safe.	4.485	0.627
I can compare similar products sold on the Internet.	3.957	0.853
The information on the website about the product is reliable.	4.442	0.601
It is very comfortable to shop online.	4.242	0.726
Prices on the Internet are lower than the prices in stores.	4.071	0.868
Companies that sell over the Internet are open to criticism.	4.171	0.862
In online shopping, convenience is provided in the process of trying and returning products.	4.371	0.565
I have enough knowledge about the use of the Internet.	3.285	1.186
<i>Total</i>	4.261	0.593

Table 2 shows the statements directed to the women participating in the research. When Table 2 is taken into consideration, it is determined that the statement with the highest participation is “Online shopping can be done at any time”. The second statement is “Online shopping provides convenience in home delivery”, while the statement with the third highest average is "Online shopping provides ease of payment at the door". In addition, it was determined that the statement with the lowest level of participation in the study statements from the women participating in the research was “I have enough information about the use of the Internet”. Secondly, the statement with the lowest average is “Comments in online shopping affect my decision on the product I will buy”, while the third lowest statement is “It is easy to find an interlocutor in the delivery process of products purchased over the Internet”.

Table 3. Differences in Level of Participation According to Marital Status Variable

<i>Factors</i>	<i>Marital Status</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>t</i>	<i>p</i>
Marital Status	Single	4.578	0.496	-1.172	0.045
	Married	4.647	0.478		

In Table 3, t-Test was performed to determine the differences between the marital status variable of the participant women and the reasons for preferring e-commerce. A significant and statistically significant difference was found between the marital status variable of the women participating in the research and the reasons for preferring e-commerce. In this direction, it was determined that married women shop online more than single women.

Table 4. Differences in Level of Participation According to Occupation Variable

<i>Occupation</i>	<i>Sum of Squares</i>	ANOVA		<i>F</i>	<i>Sig.</i>
		<i>df</i>	<i>Mean Square</i>		
<i>Between Groups</i>	4,794	5	,959	4,288	,001
<i>Within Groups</i>	76,920	344	,224		
<i>Total</i>	81,714	349			

Table 4 Anova analysis was performed to determine the differences between the occupational variable of the female participants and the reasons for preferring e-commerce. A significant and statistically significant difference was found between the occupational variable of the women participating in the research and the reasons for preferring e-commerce. Tukey HSD Test was performed to determine between which groups this difference originated.

Table 5. Tukey HSD Test for Occupation Variable

Tukey HSD Testi						
<i>(I) Occupation</i>	<i>(J) Occupation</i>	<i>Mean Difference (I-J)</i>	<i>Std. Error</i>	<i>Sig.</i>	<i>95% Confidence Interval</i>	
					<i>Lower Bound</i>	<i>Upper Bound</i>
Other	Private	,08824	,11752	,975	-,2486	,4250
	Public	-,06801	,06347	,892	-,2499	,1139

	Student	,15966	,09497	,545	-,1125	,4318
	Retired	-,41176*	,11752	,007	-,7486	-,0750
	Housewife	-,07843	,10042	,971	-,3662	,2094
Private	Other	-,08824	,11752	,975	-,4250	,2486
	Public	-,15625	,11215	,731	-,4777	,1652
	Student	,07143	,13255	,995	-,3084	,4513
	Retired	-,50000*	,14953	,012	-,9285	-,0715
	Housewife	-,16667	,13651	,826	-,5579	,2245
Public	Other	,06801	,06347	,892	-,1139	,2499
	Private	,15625	,11215	,731	-,1652	,4777
	Student	,22768	,08824	,105	-,0252	,4806
	Retired	-,34375*	,11215	,028	-,6652	-,0223
	Housewife	-,01042	,09408	1,000	-,2800	,2592
Student	Other	-,15966	,09497	,545	-,4318	,1125
	Private	-,07143	,13255	,995	-,4513	,3084
	Public	-,22768	,08824	,105	-,4806	,0252
	Retired	-,57143*	,13255	,000	-,9513	-,1916
	Housewife	-,23810	,11765	,331	-,5753	,0991
Retired	Other	,41176*	,11752	,007	,0750	,7486
	Private	,50000*	,14953	,012	,0715	,9285
	Public	,34375*	,11215	,028	,0223	,6652
	Student	,57143*	,13255	,000	,1916	,9513
	Housewife	,33333	,13651	,145	-,0579	,7245
Housewife	Other	,07843	,10042	,971	-,2094	,3662
	Private	,16667	,13651	,826	-,2245	,5579
	Public	,01042	,09408	1,000	-,2592	,2800
	Student	,23810	,11765	,331	-,0991	,5753
	Retired	-,33333	,13651	,145	-,7245	,0579

When Table 5 is taken into consideration, it is determined that retired women use e-commerce more than women from other professions.

Table 6. Differences in Level of Participation According to Internet Usage Duration Variable

<i>Internet Usage Time</i>	<i>Sum of Squares</i>	ANOVA		<i>F</i>	<i>Sig.</i>
		<i>df</i>	<i>Mean Square</i>		
<i>Between Groups</i>	4,416	4	1,104	4,928	,001
<i>Within Groups</i>	77,298	345	,224		
<i>Total</i>	81,714	349			

In Table 6, Anova analysis was performed to determine the differences between the internet usage time variable of the participant women and the reasons for preferring e-commerce. A significant and statistically significant difference was found between the reasons for preferring e-commerce and the variable of internet usage time of the women participating in

the research. Tukey HSD Test was carried out to determine between which periods this difference originated.

Table 7. Tukey HSD Test for Internet Usage Duration Variable

Tukey HSD Testi						
(I) Usage Duration Variable	(J) Usage Duration Variable	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Less Than 1 Hour	1-2 Hours	,12727	,07659	,459	-,0828	,3373
	2-3 Hours	,11616	,08101	,606	-,1060	,3383
	3-4 Hours	,22727	,08836	,078	-,0150	,4696
	More Than 4 Hours	-,27273	,12360	,180	-,6117	,0662
1-2 Hours	Less Than 1 Hour	-,12727	,07659	,459	-,3373	,0828
	2-3 Hours	-,01111	,06544	1,000	-,1906	,1683
	3-4 Hours	,10000	,07434	,663	-,1039	,3039
	More Than 4 Hours	-,40000*	,11400	,005	-,7126	-,0874
2-3 Hours	Less Than 1 Hour	-,11616	,08101	,606	-,3383	,1060
	1-2 Hours	,01111	,06544	1,000	-,1683	,1906
	3-4 Hours	,11111	,07889	,623	-,1052	,3274
	More Than 4 Hours	-,38889*	,11701	,009	-,7098	-,0680
3-4 Hours	Less Than 1 Hour	-,22727	,08836	,078	-,4696	,0150
	1-2 Hours	-,10000	,07434	,663	-,3039	,1039
	2-3 Hours	-,11111	,07889	,623	-,3274	,1052
	More Than 4 Hours	-,50000*	,12222	,001	-,8351	-,1649
More Than 4 Hours	Less Than 1 Hour	,27273	,12360	,180	-,0662	,6117
	1-2 Hours	,40000*	,11400	,005	,0874	,7126
	2-3 Hours	,38889*	,11701	,009	,0680	,7098
	3-4 Hours	,50000*	,12222	,001	,1649	,8351

When Table 7 is taken into consideration, it is determined that women with more than 4 hours of internet usage use e-commerce more than women with other internet usage time.

Table 8. Differences in Level of Participation According to Shopping Frequency

ANOVA					
Shopping Frequency	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5,244	2	2,622	11,897	,000
Within Groups	76,470	347	,220		
Total	81,714	349			

Table 8 Anova analysis was performed to determine the differences between the shopping frequency variable of the participant women and the reasons for preferring e-commerce. A significant and statistically significant difference was found between the internet usage time variable of the women participating in the research and the reasons for preferring e-commerce. Tukey HSD Test was carried out to determine between which periods this difference originated.

Table 9. Tukey HSD Test for Shopping Frequency Variable

Tukey HSD Testi						
(I) Shopping Frequency	(J) Shopping Frequency	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Daily	Weekly	,25291*	,06316	,000	,1042	,4016
	Monthly	,30342*	,06582	,000	,1485	,4583
Weekly	Daily	-,25291*	,06316	,000	-,4016	-,1042
	Monthly	,05051	,05852	,664	-,0872	,1883
Monthly	Daily	-,30342*	,06582	,000	-,4583	-,1485
	Weekly	-,05051	,05852	,664	-,1883	,0872

When Table 9 is taken into consideration, it is determined that women who shop online daily use e-commerce more than women with other online shopping frequency.

Table 10. Internet Usage Purposes of the Participants

Purpose of Internet Use	(%)
Education	5
Shopping	85
Watching videos, series or films	70
Reading newspapers or magazines	5
Banking transactions	50
Fun and games	55
Obtaining information	35
Listening to music	65
Access to social networks	85
Searching for information about goods or services	50
Others	20

Table 10 shows the purposes of the participant women's use of the Internet. It has been determined that most of the women participating in the study use the Internet for online shopping and access to social networks. In addition, it has been determined that the women participating in the study do not prefer the internet for reading newspapers or magazines and education.

Table 11. Products and Services Purchased by the Participants from the Internet

Products and Services Purchased from the Internet	%
Books, magazines, cd etc. products	5
Clothing and accessories	75
Cosmetics	90
Ticket (bus, train, plane)	50
Food products	70
Home electronics	50
Home textile products	80
Baby products	70
Flower	25
Software programmes	15
Footwear	85

Services such as banking or insurance	35
Tickets (cinema, concert, theatre)	25
Household goods (furniture, accessories)	70

Table 11 shows the products and services purchased online by the female participants. It was determined that the women who participated in the research bought cosmetic products and shoes from the internet the most. In addition, it was determined that they purchased the lowest number of products or services such as books, magazines and cd's.

CONCLUSION

Consumer behaviour has been the subject of much research due to its poorly understood nature and unexplored aspects. Today's modern marketing approaches emphasise consumer wants and needs and apply consumer-oriented decision-making mechanisms. Therefore, in order to satisfy consumers by meeting their wants and needs at the expected level, it is necessary to first try to understand them and act in line with their behaviours. Because consumers form the basis of the decision-making mechanism from the determination of goals and strategies, which is the beginning of marketing, to the stage of creating the marketing mix.

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Internet purchasing behaviour, which has started to take place in the lives of consumers as more and more users use the Internet for commercial activities, is a complex process that includes before and after. While some consumers actively approach internet purchasing behaviour, some of them avoid this behaviour and do not like it. In both cases, companies need to develop different strategies according to the results obtained by analysing consumer behaviours in detail and determining what affects these situations.

This study aims to examine the variables affecting the online purchasing behaviour process of female consumers as a result of the models obtained from the literature review on the concepts of e-commerce, online marketing and consumer behaviour.

It is concluded that the concept of convenience as a feature of the temporal and spatial independence of the Internet is an important factor affecting the online purchasing behaviour of female consumers. For example, convenience-related factors such as the ability to perform online shopping at any time of the day, payment at the door, home delivery options, access to more product types and options, time saving, and the ability to purchase products at more competitive and lower prices compared to in-store prices positively affect the online purchase intentions of female consumers. While considering preference effects, it is also necessary to

mention the trust in online sellers. Here, a person in the position of a seller communicates only over the internet and this situation creates a problem in terms of consumer trust. In particular, it creates a question mark in the minds of consumers about whether an operator operating only on the internet really exists. Consumers are not sure whether they can buy a product.

They want to know whether the service will really be offered to them. For this reason, businesses must first establish a relationship of trust with consumers in the preference factor and convince them of the reality of their existence. Another issue affecting the preference factor is the level of knowledge and attitude of individuals towards internet use and online shopping. Consumers who are more knowledgeable about internet usage and online shopping prefer online shopping methods in the same direction. What is particularly important here is that the design of the website is user-friendly, does not contain confusing elements and the shopping procedure is simple and safe.

The main target group of this study is female consumers who shop online. However, due to limiting reasons such as the impossibility of reaching this main mass, time and cost, this study could only be applied to a relatively small sample group of women and convenience sampling (n=350). Therefore, it is not correct to generalise the results of this study to all female consumers.

Future studies may be more comprehensive by increasing the sample group. Similarly, the relationship between demographic factors such as occupation and income status and online purchasing behaviour can be examined in detail. The analysis shows that there are a number of factors that affect women's online shopping process. Future research can provide more comprehensive results by addressing other factors that may affect purchase behaviour such as sales promotions, consumer experience and product features.

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**DIAGNOSTIC METHODS AND PHYSIOLOGICAL STUDY OF THE SYNDROME
OF INADEQUATE SECRETION OF ANTIDIURETIC HORMONE**

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ABSTRACT

The physiology of the release of antidiuretic hormone (ADH) from the posterior pituitary is briefly reviewed. The importance of both osmolar and non-osmolar stimuli is emphasised. Osmolar and non-osmolar factors usually reinforce each other; for example, hydropenia leads to hyperosmolality and hypovolaemia, both promoting ADH release, while hydration has the opposite effect. In disease, osmolar and non-osmolar factors may become dissociated leading to baroreceptor-mediated ADH release in the presence of hyponatraemia and hypo-osmolality. Examples include heart failure, glucocorticoid or thyroxine deficiency, hepatic cirrhosis and nephrotic syndrome with or without the superimposed effect of diuretics, i. e. conditions in which circulatory, and in particular effective arterial, volume is reduced. It is dangerous to label such conditions as ‘inappropriate’ secretion of ADH since the maintenance

of circulating volume is at least as important a physiological requirement as the defence of tonicity.

Keywords: Antidiuretic hormone, Inadequate secretion, Diagnostics, Physiology

The physiology of the release of antidiuretic hormone (ADH) from the posterior pituitary is briefly reviewed. The importance of both osmolar and non-osmolar stimuli is emphasised. Osmolar and non-osmolar factors usually reinforce each other; for example, hyponatremia leads to hyperosmolality and hypovolaemia, both promoting ADH release, while hydration has the opposite effect. In disease, osmolar and non-osmolar factors may become dissociated leading to baroreceptor-mediated ADH release in the presence of hyponatremia and hypo-osmolality. Examples include heart failure, glucocorticoid or thyroxine deficiency, hepatic cirrhosis and nephrotic syndrome with or without the superimposed effect of diuretics, i. e. conditions in which circulatory, and in particular effective arterial, volume is reduced. It is dangerous to label such conditions as 'inappropriate' secretion of ADH since the maintenance of circulating volume is at least as important a physiological requirement as the defence of tonicity (Kərimova R.C., Ağayeva A.H., Əliyeva D.M., 2023).

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The syndrome of inappropriate secretion of ADH (SIADH) is uncommon in childhood and should only be diagnosed when physiological release of ADH in response to non-osmolar as well as osmolar factors has been excluded. Criteria for the correct identification of SIADH are discussed; the presence of continuing urinary sodium excretion in the presence of hyponatremia and hypo-osmolality is essential to the diagnosis. SIADH in children is usually due to intracranial disease or injury. The mainstay of treatment is water restriction which reverses all the physiological abnormalities of the condition. Hypertonic saline is rarely indicated for the short-term control of neurological manifestations such as seizures. Drugs have little or no place in the treatment of SIADH in children. In many situations labelled as SIADH it is only the diagnosis that is inappropriate (Kərimova R.C., Ağayeva A.H., Abıyev H.Ə., 2023).

The syndrome of inappropriate secretion of antidiuretic hormone (SIADH) is a condition characterized by hypotonic and euvolemic hyponatremia along with urinary hyperosmolality, resulting from antidiuretic hormone (ADH) release in the absence of adequate stimuli. This term was first used in 1957, when Schwartz et al described hyponatremia caused by kidneys' inability to save sodium in two patients affected by lung tumor. The interest and knowledge

on this clinical condition have increased considerably in recent years, so much so as to justify a change in its name, from SIADH to SIAD (syndrome of inappropriate antidiuresis), according to the fact that not all affected patients have increasing circulating ADH level, resulting from increased release by the pituitary gland or ectopic production. Abnormal ADH activity in renal receptors or constitutive activation of the V2 vasopressin receptor (V2R) has been identified as causes of inappropriate antidiuresis with normal or not measurable hormone levels (Go S, Kim S, Son H-E, *et al.*, 2021).

Hydrosaline balance is maintained under physiological conditions through a fine regulatory mechanism that combines hypothalamus, neurohypophysis, kidneys and hormones; among these, ADH is the most important. This hormone, also known as arginine vasopressin (AVP), is synthesized in hypothalamic supraoptic and paraventricular nuclei and then stored in hypophysis through axonal transport. From here it can be released as a consequence of osmotic and non-osmotic stimuli. Among the former, the most important is the effective osmotic pressure of plasma: when it reaches the threshold of 284 mOsm/kg or higher, the ADH level starts to rise. In the latter group, hypovolemia as well as nausea, vomiting, stress, drugs, hypoglycemia, post-surgery pain and others nociceptive stimuli are described (Brooks, EK, Inder, WJ, 2022).

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To date, three AVP receptors are known: V1a, V1b (V3) and V2. V1 receptors are responsible for the vascular effects of ADH, in particular their binding can lead to hypertensive effects causing smooth muscle cell contraction; V3 receptors are placed in pituitary gland and when activated, adrenocorticotrophic hormone levels began to rise. Finally, V2Rs are found in endothelial cells and on the principal cells of renal collecting ducts membrane. It is due to V2Rs effects that ADH derived its name.⁴ The final effects of this binding are the increased synthesis and exhibition of aquaporin-2 (AQP-2) water channels on the membrane of the collecting duct; consequently, the water passes passively into the hypertonic renal interstitium, eventually leading to urine concentration, water reabsorption and reducing plasma osmolality.

Therefore, the pathophysiological basis of SIADH (or SIAD) consists in an increase in the concentration of body water due to an augmented water intake, that overcomes renal diluting urine capability, and to ADH dysregulation too. However, in some cases, the down-regulated V2R binding capacity together with a reduction of kidney AQP-2 expression, realize the so-

called phenomenon “escape from antidiuresis” as an attempt to normalize and eventually increase natremia, urine volume and renal water loss (Go S, Kim S, Son H-E, *et al.*, 2021).

Even targeted therapies, especially anti-angiogenic drugs, are described to determine hyponatremia: in particular patients with solid tumors treated with anti-VEGFR agents are those where the incidence of low sodium concentration is highest. The exact mechanism underlying the increased incidence of hyponatraemia in those patients is still unknown: Khaja et al reported that augmented vasopressin release, due to low papillary solute concentration with high urinary osmolality, might be a possible explanation. Immune checkpoint inhibitors have revolutionized the world of cancer therapy. The most relevant side effects with these drugs are immune-related diseases, and hyponatremia seems to be linked to hypophysitis (Kerimova R.C., Ağayeva A.H., Abiyev H.Ə., 2023).

Even palliative medications (non-steroidal anti-inflammatory drugs, selective serotonin reuptake inhibitors, opioid analgesics), anticonvulsants, antipsychotics, antidiabetic and illicit drugs (eg MDMA) can be related to SIADH either increasing AVP release or by potentiation its action in the collecting duct. Classically, inappropriate AVP secretion might also accompany the pulmonary disorders (such as bacterial or viral pneumonia, pulmonary abscess, tuberculosis, aspergillosis, asthma and cystic fibrosis) and disorders of the nervous system (such as infections, subdural hematoma or subarachnoid hemorrhage). Similarly pain, nausea, general anesthesia and stress are unconventional stimuli for the hypophysis secretion of vasopressin. Other causes are idiopathic and transient (exercise-associated hyponatremia) (Schutz FA, Xie W, Donskov F, *et al.* T., 2012).

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Hereditary conditions deserve a special mention: they can be found in infants and adults with hyponatremia and lack of urinary dilution, differently from SIADH. In these patients, AVP plasma levels are undetectable or very low, as they are due to gain-of-function mutations of the V2R gene. Then, the constitutively activated receptor induces water reabsorption in the collecting duct via the activation of AQP-2 receptors.

Diagnostic Workup and Differential Diagnosis: Hyponatremia is mostly occasionally found during routine laboratory tests; however, it may be suspected in patients complaining of evocative neurological symptoms. It is therefore necessary to rapidly achieve differential diagnosis to ensure the right treatment for each patient. Determining plasma osmolality is the first step in hyponatremia diagnostic workup. Unfortunately, rapid measurement of

osmolality is not always available. It can be calculated using this formula: $2 \times \text{Na (mmol/l)} + \text{glucose (mg/dl)}/18 + \text{urea (mg/dl)}/2.8$. In the presence of normal or high osmolality (>280 mOsm/kg), excessive concentration of osmotically active solutes in plasma must be identified.⁷ They might be exogenous or endogenous solutes that cannot pass through the cell membrane, remaining restricted to the extracellular fluid compartment and leading to osmotic water movement from intracellular to extracellular environment (Schutz FA, Xie W, Donskov F, et al. T.,2012).

First of all, hyperglycemia must be checked and high concentration of mannitol should be ruled out: glucose and mannitol are the most important effective osmoles. Urea and alcohol on the other hand can easily cross cellular surface contributing to measured osmolality but not to tonicity. For this reason, they are called “ineffective osmoles”: they can raise serum osmolality but do not induce hyponatremia. Pseudohyponatremia, a method-dependent serum sodium reduction, must be also excluded: it can occur when lipid or proteins concentrations are high, such as in severe hypertriglyceridemia and multiple myeloma. This can effectively hamper accurate measurement of sodium (Kərimova R.C., Ağayeva A.H., Əliyeva D.M., 2023).

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In patients with hypotonic hyponatremia, the extracellular volume (ECV) should be evaluated through clinical history, physical examination and laboratory tests. Frequent symptoms and signs are vomiting or diarrhea, orthostatic hypotension, tachycardia, poor skin turgor and dry mucus membranes. These signs can identify hypovolemia. Elevation of creatinine, blood urea nitrogen, hematocrit and uric acid level are typical findings in these patients, but they are unspecific too. They can be influenced by dietary intake, for example. The measurement of renal sodium loss is more helpful: if the spot urine $[\text{Na}^+]$ is >30 mEq/L, it is suggestive for a nephropathies or for diuretic use; instead, a spot urine $[\text{Na}^+]$ <10 mEq/L advises an extrarenal sodium loss (Go S, Kim S, Son H-E, *et al.* ,2021).

Conversely, ascites, subcutaneous and pulmonary oedema are all signs of increased ECV, that generally can be found in hypervolemic hyponatremia. Heart failure, cirrhosis and chronic kidney disease, along with acute kidney injury and nephrotic syndrome, are all severe conditions accompanied by either excessive AVP secretion or altered intrarenal factors, not allowing adequate free water excretion. In the absence of clinical history, patients that have not symptoms or signs suggestive for volume depletion or expansion should be considered euvolaemic. Euvolaemic hyponatremia takes place in the context of relative or absolute body

water plethora and it can be attributed to several diseases. Clinicians need to know urine osmolality on a spot urine sample: if it is <100 mOsm/kg H_2O , that means maximum urine dilution, primarily caused by excessive water (or beer) intake, combined with low solute intake, as in potomania (Peri A, Giuliani C., 2014).

If urine osmolality is ≥ 100 mOsm/kg H_2O , other conditions must be considered: hypothyroidism, glucocorticoid deficiency and, the most common, SIADH. Cerebral salt wasting (CSW), a condition causing hyponatremia in patients with central nervous system diseases, deserves a special mention. It is mostly described after aneurysmal subarachnoid hemorrhage but can be seen after a cerebral trauma, infective conditions, cancer (glioma, metastatic carcinoma) and even after surgery for pituitary tumor or acoustic neuroma. Pathophysiology is not clear: some authors point the finger at the brain natriuretic peptide, released after brain damage and inhibiting renal sodium reabsorption. Others underline how an injured hypothalamus cannot improve sodium reabsorption and renin release (Schutz FA, Xie W, Donskov F, et al. T., 2012).

Distinguishing CSW from SIADH is important and challenging because of the opposite treatment options. Both the disorders have similar laboratory findings (reduced serum osmolality, urine osmolality >100 mOsm/kg, urine sodium concentration >30 mmol/l) but ECV is different: the patient with SIADH is euvolemic to hypervolemic, due to free water, conversely the one with CSW appears hypovolemic. This fact translates into the different management: CSW patients should be treated mainly by solute repletion and frequently fludrocortisone, while SIADH patients must be treated with fluid restriction (Berardi R, Mastroianni C, Lo Russo G, et al., 2019).

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SIADH Treatment and Management: A few decades ago, attention was focused on the underlying disease or drug responsible. This was considered the best available option to treat SIADH. If the removal of the primary cause was not achievable, additional treatment options included: fluid restriction, sodium administration via oral preparations or, in more severe cases, hypertonic (3%) saline continuous infusion or bolus. Other treatment approaches for SIADH contemplated tetracycline demeclocycline and lithium. The former was administered since 1970 with limited results and poor accessibility, the latter were hampered by potentially significant adverse events and questionable efficacy. Urea represents a second-line potential treatment strategy, together with a combination of low-dose diuretic sodium chloride oral preparations. However, this drug is hampered by low compliance, due to gastrointestinal side

effects like nausea and debatable efficacy, despite accessible cost (Brooks,EK,,Inder.,WJ.,2022).

In order to ensure optimal management of SIADH, factors such as etiology, onset timing, severity, symptoms and extracellular volume status should lead the way of correction measures. In asymptomatic patients with mild hyponatremia, fluid restriction (around 500–800 cc per day) should be taken into consideration as the first option for a gradual normalization of sodium levels. However, this approach fails due to poor patient's compliance and requires time to be effective in addition to renal function monitoring; moreover, it should be managed carefully in cancer patients with higher risk of hypovolemic situations and in need of chemotherapeutic infusions (Peri A, Giuliani C. ,2014).

On this topic, Furst et al suggested a formula based on urine/plasma electrolyte ratio to lead fluid restriction and facilitate the identification of those patients who will better respond to it. Time of onset is another aspect that should guide the management of SIADH. In respect to this, physicians should consider acute, chronic and recurrent hyponatremia as separate settings in need of being managed differently. In many cases of chronic hyponatremia, particularly in asymptomatic patients, identification and removal of the primary cause of this electrolytic imbalance can be even more effective than elevating the serum sodium concentration through treatment (Berardi R, Mastroianni C, Lo Russo G, et al. ,2019).

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Infusion of hypertonic saline (3%) is highly recommended in acute situations with neurological symptoms. The guidelines advise a bolus of 100–150 mL in 10 minutes, which might be repeated 2 to 3 times until serum sodium increase by 5 mmol avoiding overcorrection. No more than 10mmol in the first 24 hours or 8 mmol if there are risk factors must be reached in order to prevent severe damage to central nervous system, such as central pontine myelinolysis and ultimately coma and death. The recommendation is to carry on the correction until symptoms' disappearance, with careful monitoring of patient's conditions and serum sodium concentration to avoid hyponatremia overcorrection (Berardi R, Lo Russo G, Tiseo M, et al.,2019).

If the patient is symptomatic but hyponatremia occurred chronically, correction should be performed more gradually (1.5 to 2 mmol/L/h). Time for a new therapeutic approach to SIADH-induced hyponatremia has come with the introduction of AVP-antagonistic agents specific for V2R named vaptans. Tolvaptan is administered orally and has been approved in

the US and Europe for the treatment of euvoalaemic hyponatraemia caused by SIADH. In the SALT-1 and SALT-2 studies, patients with SIADH were randomized to receive oral tolvaptan 15mg daily or placebo. The correction rate of serum sodium levels in both the studies was significantly increased with the vaptan compared to placebo, drug toxicity was manageable and included thirst, dry mouth, liver toxicity and polyuria. Moreover, Tolvaptan may interact with cytochrome metabolism of several molecules, not to mention its considerable cost. Nevertheless, a double-blind randomized placebo-control clinical trial conducted by Salahudeen et al on cancer patients with SIADH proved the superiority of tolvaptan also in the malignant setting. Despite these findings, over the years first-line treatment with tolvaptan in SIADH has not been encouraged by European guidelines. As a matter of fact, tolvaptan, although effective, does not affect overall mortality, can result in overcorrection and has only been compared against placebo. Notably, in the study of Salahudeen et al, no overcorrection of serum sodium was reported in the tolvaptan group. Petereit et al demonstrated that treatment with tolvaptan may enable hyponatremic SCLC patients to receive chemotherapy and lead to an improvement in performance status (Berardi R, Lo Russo G, Tiseo M, et al., 2019).

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Moreover, a recent observational multicenter Italian study supported the role of tolvaptan in the armamentarium against cancer-related SIADH with a twofold positive effect: improving overall survival (OS) and reducing hospitalization length. On the counterpart, the investigators also observed a considerably increased duration of hospital stay in those patients not treated with tolvaptan (Brooks, EK., Inder., WJ., 2022).

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**AS A RESULT OF THE INFLUENCE OF DRUGS AND OTHER EXOGENOUS
SUBSTANCES DIAGNOSIS, TREATMENT AND PHYSIOLOGICAL
CHARACTERIZATION OF HYPOTHYROIDISM**

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ABSTRACT

The functional anatomy and physiology of the hypothalamus-pituitary-thyroid axis. Although the hypothalamus comprises less than 2% of the total brain volume, it has a key role in regulating the pituitary function and homeostatic balance. It is composed of different nuclei with distinct functions that synthesize different hormones in response to physiological changes. Its rostral nuclear portion exerts prominent regulation of homeostatic behaviours related to energy balance and reproduction. The two caudal portions are primarily involved in ensuring adequate metabolic resources for defensive and exploratory behaviours and responses to sudden changes in endogenous and exogenous stimuli.

Keywords: Medicines, Exogenous substances, Hypothyroidism, Diagnostics, Treatment, Physiology

The functional anatomy and physiology of the hypothalamus-pituitary-thyroid axis:

Although the hypothalamus comprises less than 2% of the total brain volume, it has a key role in regulating the pituitary function and homeostatic balance. It is composed of different nuclei with distinct functions that synthesize different hormones in response to physiological changes. Its rostral nuclear portion exerts prominent regulation of homeostatic behaviours related to energy balance and reproduction. The two caudal portions are primarily involved in ensuring adequate metabolic resources for defensive and exploratory behaviours and responses to sudden changes in endogenous and exogenous stimuli. The hypothalamic tuberoinfundibular and neurohypophyseal systems are involved in control of both anterior and posterior pituitary hormone secretions, as well as other hormones involved in food and fluid intake, lactation, thermoregulation, circadian rhythmicity and the sleep-wake cycle, all of which are also very carefully regulated (Kerimova R. C., Ağayeva A.H., Quliyeva N.T., 2023).

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The hypothalamus-pituitary-thyroid axis is one of several hormone regulatory systems from the hypothalamus to the pituitary and ultimately to the peripheral target organs. The hypothalamus and the pituitary gland are in close anatomical proximity at the base of the brain and extended through the pituitary stalk to the sella turcica. The pituitary stalk allows passage of stimulatory and inhibitory hormones and other signal molecules. The target organs are placed in the periphery and function through stimulation/inhibition by the circulating pituitary hormones. The several hypothalamus-pituitary-target organ axis systems interact in very sophisticated and complicated ways and for many of them the interactive and integrated mechanisms are still not quite clear. The diagnosis of central hypothyroidism is complicated by itself but challenged further by concomitant affection of other hypothalamus-pituitary-hormone axes, the dysfunction of which influences the diagnosis of central hypothyroidism. Treatment of both the central hypothyroidism and the other hypothalamus-pituitary axes also influence the function of the others by complex mechanisms involving both central and peripheral mechanisms ((Park, J.H.; Pyun, W.Y.; Park, H.W., 2020).

Clinicians managing patients with neuroendocrine disorders should become aware of the strong integrative influence from each hypothalamus-pituitary-hormone axis on the physiology and pathophysiology of central hypothyroidism. As an aid in this direction the

present review summarizes and highlights the importance of the hypothalamus-pituitary-thyroid axis, pitfalls in diagnosing central hypothyroidism, diagnosing/testing central hypothyroidism in relation to panhypopituitarism, pointing at interactions of the thyroid function with other pituitary hormones, as well as local hypothalamic neurotransmitters and gut-brain hormones. Furthermore, the treatment effect of each axis on the regulation of the others is described. Finally, these complicating aspects require stringent diagnostic testing, particularly in clinical settings with lower or at least altered *a priori* likelihood of hypopituitarism than in former obvious clinical patient presentations (Wang, Y.; Wang, Y.; Pi, C.; Feng, X.;2020).

Thyroid hormone replacement for hypothyroidism can be achieved via several approaches utilizing different preparations of thyroid hormones, T3, and/or T4. “Combination therapy” involves administration of both T3 and T4, and was technically the first treatment for hypothyroidism. It was lauded as a cure for the morbidity and mortality associated with myxedema, the most severe presentation of overt hypothyroidism. In the late nineteenth and the early Twentieth centuries, combination therapy *per se* could consist of thyroid gland transplant, or more commonly, consumption of desiccated animal thyroid, thyroid extract, or thyroglobulin. Combination therapy remained the mainstay of therapy for decades despite development of synthetic formulations of T4 and T3, because it was efficacious and cost effective. However, concerns emerged about the consistency and potency of desiccated thyroid hormone after cases were reported detailing either continued hypothyroidism or iatrogenic thyrotoxicosis. Development of the TSH radioimmunoassay and discovery of conversion of T4-to-T3 in humans led to a major transition in clinical practices away from combination therapy, to adoption of levothyroxine “monotherapy” as the standard of care. Levothyroxine monotherapy has a favorable safety profile and can effectively normalize the serum TSH, the most sensitive marker of hypothyroidism. Whether levothyroxine monotherapy restores thyroid hormone signaling within all tissues remains controversial. Evidence of persistent signs and symptoms of hypothyroidism during levothyroxine monotherapy at doses that normalize serum TSH is mounting. Hence, in the last decade there has been acknowledgment by all thyroid professional societies that there may be a role for the use of combination therapy; this represents a significant shift in the clinical practice guidelines. Further bolstering this trend are the recent findings that the Thr92AlaD2 polymorphism may reduce thyroid hormone signaling, resulting in localized and systemic hypothyroidism. This strengthens the hypothesis that treatment options could be personalized,

taking into consideration genotypes and comorbidities. The development of long-acting formulations of liothyronine and continued advancements in development of thyroid regenerative therapy, may propel the field closer to adoption of a physiologic thyroid hormone replacement regimen with combination therapy (Kərimova R. C.,Ağayeva A.H.,Quliyeva N.T.,2023).

Hypothyroidism is a prevalent condition, diagnosed in most cases by an elevation in serum TSH. While severe myxedema has been clinically recognized since the nineteenth century, the diagnosis of lower-grade hypothyroidism has not always been straightforward; early diagnostic attempts relied on parameters such as a slow basal metabolic rate (BMR), low serum protein-bound iodine (PBI), or even clinical responsiveness to thyroid preparations . In patients for whom the diagnosis has been secured, thyroid hormone replacement has been the mainstay of therapy for over a century. Natural thyroid preparations, i.e., thyroid extract, desiccated thyroid, or thyroglobulin, were the first pharmacologic treatments while synthetic agents were introduced later and are the standard of care today . Despite major progress, there remains debate as to whether a universal approach is applicable to all patients and which agent constitutes the best thyroid hormone replacement (Leite, P.M.; Martins, M.A.P.;2021).

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Many different drugs affect thyroid function. Most of these drugs act at the level of the thyroid in patients with normal thyroid function, or at the level of thyroid hormone absorption or metabolism in patients requiring exogenous levothyroxine. A small subset of medications including glucocorticoids, dopamine agonists, somatostatin analogs and rexinoids affect thyroid function through suppression of TSH in the thyrotrope or hypothalamus. Fortunately, most of these medications do not cause clinically evident central hypothyroidism. A newer class of nuclear hormone receptors agonists, called rexinoids, cause clinically significant central hypothyroidism in most patients and dopamine agonists may exacerbate ‘hypothyroidism’ in patients with nonthyroidal illness. Many drugs and medications can affect thyroid function. Thyroid hormone levels can be altered by drugs at many levels including the hypothalamus, thyrotropes in the anterior pituitary gland, synthesis and secretion from the thyroid gland and metabolism of thyroid hormones through deiodination, sulfation and glucuronidation. Drugs may also affect thyroid hormone levels by altering affinity for or levels of thyroxine binding globulin. Finally, drugs may affect absorption of thyroid hormone in patients who are dependent on exogenous levothyroxine (Leite, P.M.; Martins, M.A.P.;2021).

Glucocorticoids: Glucocorticoids have long been known to affect serum TSH levels in humans . Physiologic levels of hydrocortisone appear to play an important role in the diurnal variation of serum TSH levels with lower levels in the morning and higher levels at night . Wilber and Utiger showed that high dose glucocorticoids suppressed serum TSH in hypothyroid patients and normal subjects. This effect appeared to involve TSH secretion and was controlled at the level of the hypothalamus. Others have confirmed this effect, but long-term high dose glucocorticoids or Cushing's syndrome cortisol excess do not appear to cause clinically evident central hypothyroidism requiring thyroid hormone replacement . Dexamethasone doses as low as 0.5 mg can lower serum TSH levels, while 30 mg of prednisone is likely required to significantly alter TSH levels . Glucocorticoids appear to suppress release of TSH from thyrotropes in a PKC-dependent manner through the protein annexin 1 . The effect of glucocorticoids on TSH secretion is likely through inhibition of TRH in the hypothalamus. Glucocorticoid receptors are found in the TRH neurons of the PVN and a glucocorticoid response element has been identified on the TRH gene . Alkemade and colleagues have more recently shown that high dose glucocorticoids decrease TRH mRNA levels in the human hypothalamus, which is likely the primary mechanism for lower TSH secretion from the pituitary (Wang, Y.; Wang, Y.; Pi, C.; Feng, X.;2020).

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In summary, glucocorticoids can lower serum TSH levels and decrease TSH secretion through direct effects on TRH in the hypothalamus. Chronic high dose glucocorticoids or severe Cushing's syndrome do not appear to cause clinically significant central hypothyroidism (Alqahtani, M.S.; Kazi, M.; Alsenaidy, M.A.;2021).

Dopamine/bromocryptine: Dopamine used in critical illness and the dopamine agonist bromocryptine used for disorders like hyperprolactinemia can suppress serum TSH. Bromocryptine has been shown to reduce serum TSH in patients with selective pituitary resistance to thyroid hormone (Park, J.H.; Pyun, W.Y.; Park, H.W.,2020).

Dopamine exerts its effect on the hypothalamic-pituitary-thyroid axis through the activation of dopamine D2 receptors (D2R), but appears to have opposite effects on the hypothalamus and the pituitary thyrotrope. Dopamine infusions in healthy volunteers reduces TSH pulse amplitude without significantly altering TSH pulse frequency . Bromocryptine appears to have the same effect on TSH pulse amplitude and is likely occurring through the same D2R mechanism. Interestingly, dopamine stimulates release of TRH from rat hypothalamus through the same D2R, but the overall effect of dopamine is to lower serum TSH so this direct stimulatory effect on the hypothalamus cannot override the inhibitory effect of dopamine on the pituitary. Prolonged

treatment with bromocryptine does not appear to cause central hypothyroidism since many patients treated with bromocryptine for macroprolactinomas actually have resolution of central hypothyroidism caused by the adenoma . Studies using dopamine infusions in critically ill adults and neonates with the nonthyroidal illness (NTI) syndrome suggest that dopamine and NTI have an additive effect of HPT axis suppression. This may lead to iatrogenic central hypothyroidism in these patients . It is not clear whether treatment with levothyroxine is indicated in patients with NTI who are receiving dopamine infusions (Uchida, Y.; Goto, R.; Usui, T.;2022).

Somatostatin analogs: Somatostatin binds to 5 different extracellular receptors on pituitary cells to inhibit hormone secretion through adenylate cyclase signaling, calcium flux and cell polarization . Analogs of somatostatin are an effective medical therapy in patients with the syndrome of pituitary resistance to thyroid hormone or TSH-secreting pituitary tumors that cannot be adequately controlled with surgery . Administration of somatostatin to healthy volunteers decreased both pulse amplitude and pulse frequency of serum TSH during frequent blood sampling . This is at least in part through direct inhibition of TSH secretion from pituitary thyrotropes. Long-acting somatostatin analogs suppress serum TSH and blunt TRH-stimulated TSH levels in healthy volunteers, while chronic nocturnal octreotide therapy in children treated for tall stature reduces nocturnal levels of serum TSH without affecting serum thyroxine concentrations . A one year study of continuous octreotide infusion as therapy to prevent retinopathy in diabetes, showed that TSH levels were modestly suppressed, but these patients did not have clinically significant central hypothyroidism . Acromegalics treated with octreotide for one month demonstrated lower serum TSH and blunted TRH-stimulated levels, but continued treatment for 6 months had no effect on basal TSH levels or serum T4 levels. Interestingly, serum T3 levels remained lower and TRH-stimulated TSH levels were blunted after 6 months of therapy. Another study also showed lower serum T3 levels in acromegalic patients treated with octreotide, which was associated with higher reverse T3 levels, suggesting that octreotide therapy may directly or indirectly affect thyroid hormone metabolism. In summary, somatostatin analogs suppress serum TSH likely through direct effects on pituitary thyrotropes, but these effects are primarily transient and do not appear to cause clinically significant central hypothyroidism (Alqahtani, M.S.; Kazi, M.; Alsenaidy, M.A.;2021).

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Rexinoids: Retinoids are a subclass of vitamin A derivative drugs, or retinoids, that interact with a specific nuclear hormone receptor, the retinoid X receptor (RXR). RXR forms a protein partner, or heterodimer, with other nuclear transcription factors, including thyroid hormone receptor (TR), retinoic acid receptor (RAR), vitamin D receptor (VDR), peroxisome proliferator-activated receptor (PPAR) and liver X receptor among others. These heterodimer partners can influence

transcription of many different target genes through ligand activation of either RXR or its protein partner (Kalaimathi, K.; Shine, K.; Gandhi, G.R.;2023).

Laboratory-based definition of hypothyroidism: The thyroid gland is physiologically not independently capable of maintaining adequate thyroid hormone supply, requiring thyroid hormone production rates to be raised by pituitary TSH stimulation to both escape hypothyroidism and increase T4 to T3 conversion efficiency. Thyroid hormones, in turn, exert a negative feedback on pituitary TSH secretion to prevent their overproduction. Modern thyroid test strategies have exploited the relationship between TSH and thyroid hormones for diagnostic purposes. Other TSH receptor agonists may mimic the actions of TSH in an uncontrolled manner, such as human chorionic gonadotropin in pregnancy and TSH receptor antibodies in Graves' disease. Notably, the contemporary definition of hypothyroidism is exclusively laboratory-based, relying heavily on the measurement of pituitary TSH.⁷ Formally, a confirmed elevated serum TSH level in the presence of free thyroxine (FT4) concentrations still within the population reference range is termed subclinical hypothyroidism, whereas a combination of FT4 measurement below its range with an elevated TSH concentration defines primary hypothyroidism. Although TSH measurement using modern assay technology is advantageous in providing a sensitive screening tool for primary hypothyroidism, this TSH-centred strategy applies only to the diagnosis of primary hypothyroidism, failing in the cases of secondary hypothyroidism and non-thyroidal illness (Kalaimathi, K.; Shine, K.; Gandhi, G.R.;2023).

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The TSH-centred strategy has not remained unchallenged, and the deficiencies of this approach in its lack of diagnostic specificity and reliability have been reviewed elsewhere. The problem is more fundamentally rooted in the nature of thyroid hormone activity and the principles guiding their regulation. Consequently, recent guidelines have separated therapeutic targets from diagnostic criteria, recommending to withhold LT4 substitution in a substantial portion of patients with subclinical hypothyroidism until TSH concentrations exceed a higher threshold of 10 mIU/L. This is higher than the upper limit of the diagnostic reference range defining the disease, which for most assays is approximately 4 mIU/L. This elevated decision point setting appears to stem from a desire to minimise the application of therapy in patients who may not require it. Accordingly, as for indicating treatment of hypothyroidism, clinicians are left with a paradox that establishing a diagnosis of subclinical hypothyroidism no longer implies that the disease may warrant treatment. This has created a dilemma for the disease understanding of practitioners and patient communication, reigniting the debate whether subclinical hypothyroidism should be regarded

as a laboratory constellation rather than a clinical disease entity. To appreciate the strengths and deficiencies of the process, the evaluation of a patient with hypothyroidism must be reassessed (Uchida, Y.; Goto, R.; Usui, T.; 2022).

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**HUNTINGTON'S DISEASE GENETIC-PHYSIOLOGICAL RESEARCH,
TREATMENT AND DIAGNOSTIC METHODS**

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ABSTRACT

Huntington disease (HD), a neurodegenerative autosomal dominant disorder, is characterized by involuntary choreatic movements with cognitive and behavioral disturbances. It occurs as a result of cytosine, adenine, and guanine (CAG) trinucleotide repeats on the short arm of chromosome 4p16.3 in the Huntingtin (HTT) gene. This mutation leads to an abnormally long expansion of the polyglutamine in the HTT protein, which leads to neurodegeneration. The expansion also causes the HTT protein to be more prone to aggregation and accumulation that mitigates protein folding. HD commonly affects patients between the ages of 30 to 50 years. However, the longer the CAG repeats, the earlier the onset of symptoms. The term juvenile HD refers to the onset of illness before the age of 20 and is characterized by learning difficulties as well as behavioral disturbances at school.

Keywords: Huntington's disease, Genetics, Treatment, Diagnostics

Huntington disease (HD), a neurodegenerative autosomal dominant disorder, is characterized by involuntary choreatic movements with cognitive and behavioral disturbances. It occurs as a result of cytosine, adenine, and guanine (CAG) trinucleotide repeats on the short arm of chromosome 4p16.3 in the Huntingtin (HTT) gene. This mutation leads to an abnormally long expansion of the polyglutamine in the HTT protein, which leads to neurodegeneration. The expansion also causes the HTT protein to be more prone to aggregation and accumulation that mitigates protein folding. HD commonly affects patients between the ages of 30 to 50 years. However, the longer the CAG repeats, the earlier the onset of symptoms. The term juvenile HD refers to the onset of illness before the age of 20 and is characterized by learning difficulties as well as behavioral disturbances at school (Rawlins MD, Wexler NS, Wexler AR, Tabrizi SJ.,2016).

Diagnosis can be made - clinically in a patient with motor and or cognitive and behavioral disturbances with a parent diagnosed with HD and can be confirmed by DNA determination. In those patients who are at-risk for the disease, pre-manifest diagnosis can determine if they carry the gene. There is no cure for the disease, and affected patients tend to be entirely dependent on their caregiver as the disease progresses. Therefore, treatment is aimed at improving the quality of life and decreasing complications. Pneumonia is a common cause of death, followed by suicide (Banerjee M, Datta M, Bhattacharyya NP.,2017). Huntington disease is an autosomal dominant disorder caused by the elongation of CAG repeats on the short arm of chromosome 4p16.3 in the HTT gene. The gene encodes for the HTT protein, which plays a role in the synaptic function and also plays a crucial role in the post-embryonic period. It is thought to have anti-apoptotic functions as well as protect against the toxic mutant HTT. There is some evidence that the mutant protein leads to both an addition as well as a loss of function. Intranuclear and intracytoplasmic inclusions are found in several areas of the brain. It is, however, unknown if the inclusions themselves play a role in the pathogenesis or if they are pathogenic themselves. The brain atrophy, particularly in the striatum with associated extensive neuronal loss, is well known (Martino D, Stamelou M, Bhatia KP.,2013).

Patients commonly have the HTT allele with CAG repeats in the range of 36 to 55. Those with juvenile-onset of the disease usually have CAG repeats greater than 60. Patients with alleles in the range of 27 to 35 do not show the disease phenotype but are, however, prone to repeat instability. There is an inverse correlation between the length of the repeats and the age

of onset, which is determined by the onset of the first motor manifestation. The length of the repeats also determines 70% of the variation in the age of onset. The anticipation phenomenon is seen in the paternal line of inheritance, which arises due to the instability of the CAG repeats during spermatogenesis. Anticipation leads to a phenomenon that is common in HD, where an affected offspring of a patient with the condition will develop the disorder at a younger age than the relative who passed on that gene (Banerjee M, Datta M, Bhattacharyya NP.,2017).Studies have found three significant categories of risk factors for the onset of the disease. The CAG repeat lengths in the HTT gene, instability of CAG, and genetic modifiers were identified as risk factors. Among these, the most critical risk factor was found to be CAG repeat lengths. Genetic factors play an essential role in the progression of the disease. CAG length is also a significant factor for the progression of the disease, especially in cognitive, motor, and neurological disturbances. HD is a rare neurodegenerative disorder with a worldwide prevalence of 2.7 per 100,000. The prevalence varies amongst geographical locations by more than ten-folds; this can be attributed to differences in approach to case-ascertainment as well as diagnostic criteria. Due to the adult onset of the disease, patients may show expanded CAG repeats rather than manifest the disease. There is also an incomplete penetrance at the lower end of the CAG repeats. Therefore, the frequency of expanded repeats might be higher in the general population than previously assumed. A lower prevalence in the Asian population has been seen consistently together with higher prevalence in Europe, North America, and Australia. This could be due to the HTT gene haplotypes (Rawlins MD, Wexler NS, Wexler AR, Tabrizi SJ.,2016).

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Pathophysiology: The primary feature is the degeneration of neurons in the putamen, caudate as well as the cerebral cortex. The preferential degeneration of the enkephalin-containing medium spiny neurons in the basal ganglia in the indirect pathway provides the basis for chorea. Additional loss of substance-P containing medium spiny neurons in the direct pathway results in the development of dystonia and akinesia. The region-specific pattern of loss of neurons in the cortex and basal ganglia in the affected patients could explain the phenotypic variability. There are multiple theories in the pathogenesis of HD, and more than one process can occur at the same time: Neuronal aggregates: Intracytoplasmic and intranuclear inclusions containing the mutant HTT are components of the proteolytic pathway in HD. Accumulation of these mutant protein aggregates could lead to an impairment of the ubiquitin-proteasome pathway (Martino D, Stamelou M, Bhatia KP.,2013).

Excitotoxicity: This is due to a combination of increased glutamate as well as glutamate agonist release from the cortical afferents. Mitochondrial dysfunction and altered energy metabolism. Changes in axonal transport and synaptic dysfunction. The disease tends to affect patients between the ages of 30 to 50. The signs and symptoms classically consist of motor, cognitive, and psychiatric disturbances. Other less common features include weight loss, sleep disturbances, and autonomic nervous system dysfunction (Banerjee M, Datta M, Bhattacharyya NP.,2017).

Motor disturbances: These include the characteristic unwanted involuntary movements which initially begins in the distal extremities and are of a smaller degree but could go on to affect the facial muscles as well. The movements then spread gradually to the more proximal and axial muscles and are of greater amplitude. Motor symptoms tend to be progressive. Early in the disease, they are mostly hyperkinetic with involuntary chorea. In later stages, however, hypokinesia with bradykinesia and dystonia predominate. The balance between chorea and hypokinesia varies from patient to patient and ranges from overwhelming rigidity in the younger patients, also known as the Westphal variant to older patients being severely affected in the later stages of the disease with rigidity and contractures in the extremities leading them to be bedridden. Dysarthria and dysphagia develop during the course of the disease, which could lead to aspiration in patients, with pneumonia being a common cause of death. Dystonia, characterized by increased muscle tone with slower movements, leads to abnormal posturing such as torticollis and can be the first sign of motor involvement in HD. Other involuntary features include tics and cerebellar signs such as ataxia. Pyramidal signs such as the Babinski sign are present. The motor disturbance on daily activities progresses over time and can lead to difficulties in walking, standing, and frequent falls (Banerjee M, Datta M, Bhattacharyya NP.,2017).

Behavioral and psychiatric symptoms: These are present very early in the disease, often even prior to the onset of motor symptoms. Behavioral and psychiatric symptoms are often consistent with frontal lobe dysfunction. Initially, patients may present with poor attention, impulsivity, and irritability. The irritability is often severe and leads to outbursts of anger and aggression. Later on in the disease, there is an emotional blandness with prominent apathy, loss of intuition, and creativity. The frontal lobe symptoms are likely due to the frontostriatal degeneration. The most common feature of the disease is apathy, which is progressive and manifests alongside progressive motor disturbances and cognitive decline. Depression is also

commonly reported, but it is unclear whether these are due to the manifestation of the disease or underlying neural pathology. Suicide may occur between the time of gene testing and when a patient's dependence starts to increase. Psychosis can appear in later stages, which goes hand in hand with cognitive decline. Another prominent feature is the lack of insight into the nature of the symptoms they are experiencing. This includes a lack of awareness of all three domains of the disease (motor, cognitive, and psychiatric). Therefore, family members become a crucial source of information and should be involved in decision making and assessment (Machiela E, Dues DJ, Senchuk MM.,2016).

Cognitive disturbances: Cognitive decline is one of the main features of HD and could also be present before the onset of motor disturbances. The cognitive changes are more prominent for executive functions with patients finding difficulty in organizing, multitasking, and planning. These symptoms then progress with more cognitive deficits leading to dementia. Dementia in HD is subcortical in nature, and the memory loss originates from an inefficient search of memory rather than a deficient memory, and features such as apraxia and aphasia, which is common in cortical dementia are spared in HD. Psychomotor processes become severely slowed (Banerjee M, Datta M, Bhattacharyya NP.,2017).

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Other secondary symptoms include:Ataxia: Rarely occurs. Patients might exhibit mild degrees of cerebellar atrophy, and the presence of more severe cerebella dysfunction is suggestive of an alternate diagnosis.

Gait abnormalities:Eye movement abnormalities: Patients exhibit slow and hypometric gaze with a superimposed dysfunctional gaze. A mild form of oculomotor apraxia can also be seen.Seizures: these are only present in the juvenile variant, occurring in 30 to 50% of patients before the age of 10.

Clinical course and classification: 1) Presymptomatic HD (if genetically confirmed and clinically at risk if not confirmed): there are no signs or symptoms of motor or cognitive disturbances. These patients might exhibit changes in imaging. Generally, no symptomatic treatment is indicated (Bachoud-Lévi AC, Ferreira J, Massart R.,2019).

2) Prodromal HD (if genetically confirmed and clinically prodromal HD if not confirmed): Patients start to exhibit subtle motor and cognitive disturbance. Behavioral changes, such as

apathy and depression, might be present. The changes in imaging are seen. Patients may require symptomatic treatment. Initiating disease-modifying treatments may be appropriate.

3) Manifest HD (if patients are genetically confirmed and clinically manifest HD if they are not genetically confirmed): Prominent motor and/or cognitive disturbances that interfere with the quality of life are seen. Start symptomatic and disease-modifying treatments (Martin DDO, Ladha S, Ehrnhoefer DE.,2015). Overall, the mean age of onset is approximately 45 years. Patients who often present with neurological symptoms also exhibit psychiatric changes. Early in the course of the disease following diagnosis, symptoms such as changes in eye movements, mental planning, depressed or irritable mood as well as mild involuntary movements can be observed. The affected patients are generally able to perform their daily activities. Eventually, chorea progresses, and it becomes increasingly difficult to perform voluntary activities. There are intermittent bursts of aggressive behavior and social disinhibitions. Although patients can maintain some degree of independence, most depend on their caregiver for help. In the later stages of the disease, severe motor disability is noted, and patients are completely dependent on caregivers. The median survival after the onset of the disease is 15 to 18 years. In around 25% of patients, a delayed onset is seen, and these patients exhibit symptoms after the age of 50 and some after the age of 70. Chorea and disturbances in gait are noted on them and often exhibit a benign and more prolonged course than typical patients (Machiela E, Dues DJ, Senchuk MM.,2016).

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Juvenile Huntington disease: The onset of symptoms is before the age of 20 years. The length of CAG repeats is more than 55. Motor, cognitive and psychiatric disturbances exhibited in adult HD are also seen in the juvenile form, but the clinical presentation is different. Most often, behavioral disturbances and learning difficulties are the first signs which are noticed in school. Motor disturbances include hypokinesia and bradykinesia with dystonic components. Chorea is rarely seen in the first decade, and commonly appears in the second decade of life. Epileptic fits are commonly observed. Severe mental deterioration, as well as cerebellar symptoms associate with motor, speech, and language delay, are characteristics of juvenile HD. In teenagers, the manifestation of the disease is similar to adult HD, where chorea and severe behavioral disturbances are often the initial presentations. Once the diagnosis of the disease is delivered to the patient, both short-and long-term responses to living with HD will occur. Recognizing the state of psychological response is crucial prior to delivering the diagnosis. In a minority of patients, this

psychological readiness lags behind symptomatology and could result in significant adverse events. Therefore, understanding of the stages provides a framework for evaluating their state of mind and determining the readiness to receive the diagnoses.

The diagnosis is made on clinical signs and symptoms in a patient with a parent with proven HD. The presence of motor symptoms with or without psychiatric and cognitive disturbances or usually a combination of all three in the presence of positive family history is normally sufficient for a diagnosis. The sequence of the motor, psychiatric, and cognitive disturbances are variable and can lead to a delay in diagnosis or misdiagnosis. Basic investigations should be performed before genetic testing is done. Lab testing becomes particularly useful to differentiate HD from other progressive hereditary HD-like syndromes. An increase in creatine kinase and liver enzymes are frequently seen in chorea-acanthocytosis and McLeod syndrome. Patients with pantothenate kinase-associated neurodegeneration might show abnormal lipoprotein electrophoresis (Dayalu P, Albin RL.,2015). Magnetic resonance imaging (MRI) is useful for the diagnosis. MRI findings are present before overt clinical manifestation; brain volume and brain connections show changes several years before the onset of clinical manifestation. Adult-onset of HD is typically characterized by early striatal atrophy in the caudate. Cerebellar and cortical atrophy is seen later in the disease. MRI is important to help differentiate HD from all forms of spinocerebellar ataxia and can be used to aid in the diagnosis of juvenile HD from other metal accumulation disorders such as Wilson's disease and aceruloplasminemia. However, several progressive HD-like syndromes are indistinguishable based on MRI findings. Both chorea-acanthocytosis and McLeod's syndrome show caudate atrophy accompanied by the dilatation of the anterior horns of the lateral ventricle (Banerjee M, Datta M, Bhattacharyya NP.,2017). The gold standard for evaluation is genetic testing. This includes targeted testing of the CAG repeat size. A patient with 26 or fewer repeats is not associated with the HD phenotype. Allele sizes of 27-35 are not common and have not been associated with the HD phenotype. However, due to the instability of CAG, they may be at risk of having a child with an allele in the disease-causing range. Allele sizes of 36 to 39, also known as reduced penetrance HD-causing alleles, are at risk for developing HD but may not be symptomatic. It is common to find asymptomatic elderly patients with CAG repeats in this range. Allele size of 40 or more repeats is associated with the development of the disease (Martin DDO, Ladha S, Ehrnhoefer DE.,2015).

Prenatal diagnosis is made with chorionic villi sampling, which is performed between the 10th to 12th week of pregnancy and amniocentesis between the 15th to 17th week, where DNA-testing can be carried out. The procedure is only done if the parents are already aware of their own genetic status. Preimplantation diagnosis is also offered in several countries during the last decade where a cell from the embryo in its eight-cell stage is removed for genetic testing. Analysis of monogenic disorders can be done by a polymerase chain reaction to amplify the DNA and to detect the repeat sizes of each chromosome. The eggs are harvested, fertilized in vitro, tested, and the embryo without the CAG repeats is then placed back in the mother's womb for normal pregnancy to develop (Fang F, Peng T, Yang S, Wang W, Zhang Y.,2016).

Treatment-Management: There is no cure for HD. However, many therapeutic options exist for treating signs and symptoms with the aim of improving the quality of life. Treatment is mainly pharmacological as well as supportive. Surgical management does not play an important role. There are many therapeutic and surgical options that have been evaluated for their efficacy in suppressing chorea, including dopamine antagonists, benzodiazepines, acetylcholinesterase, lithium, deep brain stimulation, and glutamate antagonists. These measures typically address the hyperkinetic movement disorders associated with HD, such as chorea, dystonia, and myoclonus. Adjunctive therapies, as well as behavioral plans and cognitive interventions, may also play a role and should be considered. It is important to consider the negative impact of the agent of the psychiatric disturbances associated with HD, such as depression, mania, irritability, or apathy (Dayalu P, Albin RL.,2015).

Chorea: The American Academy of Neurology guidelines recommends the use of tetrabenazine (TBZ), amantadine, or riluzole in managing chorea. TBZ reversibly inhibits the central monoamine transporter type 2, thereby selectively depleting dopamine than norepinephrine. The highest binding sites for TBZ are in the putamen, caudate nucleus, and the nucleus accumbens, which are known to be the most affected in HD (Bachoud-Lévi AC, Ferreira J, Massart R.,2019). Potential side effects include depression, fatigue, akathisia, insomnia, and somnolence during titration of the drug. Depression is common in HD and can be exacerbated by using TBZ. Therefore, all patients need to be monitored for signs of depression as well as suicide ideation. Other medications that are commonly prescribed include dopamine antagonists, benzodiazepines as well as glutamate antagonists. Dopamine antagonists are considered in the management of chorea and psychosis. Apathy, as well as

akathisia, are adverse effects of dopamine receptor blockers and therefore, can be problematic in patients with HD. Compounds containing L-Dopa might increase chorea (Dayalu P, Albin RL.,2015).Due to their improved tolerability, atypical neuroleptics have been evaluated in the management. Olanzapine has been used in small studies to treat the motor symptoms. There are reports of risperidone in the treatment of chorea with tolerable adverse effects. Quetiapine has been tried in multiple trials with success on both the motor as well as psychiatric symptoms. Aripiprazole has been found to be of benefit in the treatment of chorea, equivalent to that of TBZ, However, similar to other typical and atypical neuroleptic agents, and it is associated with akathisia as well as tardive dyskinesia.Amantadine, an N-methyl D-aspartate antagonist, has been shown to significantly reduce chorea. However, a dose of 400 mg/day or higher is needed for symptomatic relief.Riluzole inhibits the striatal glutamate release, and its neuroprotective effects are being studied in large trials.

Parkinsonism: In patients with the Westphal variant (bradykinesia and rigidity), antiparkinsonian medications can be considered, such as levodopa, dopamine agonists as well as amantadine. Botulinum injections can be considered for focal dystonia.

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Behavioral and Psychiatric disturbances: There is a wide range of behavioral and psychiatric issues in HD, such as aggression, depression, irritability, apathy, mania, and psychosis. Although selective serotonin reuptake inhibitors (SSRI), tricyclic antidepressants are commonly used in HD for the treatment of depression, anxiety, and obsessive-compulsive disorders, there is no convincing evidence of their use in HD. Non-pharmacological treatment should also be considered when possible, including environmental changes and therapy (Martin DDO, Ladha S, Ehrnhoefer DE.,2015).

Non-medical interventions: Supportive care with attention to diet, nursing, and special equipment is recommended. Smoking and alcohol use is discouraged.Emotional support, as well as counseling, can provide relief to patients living with HD and their families (Machiela E, Dues DJ, Senchuk MM.,2016).

Gene therapy: Gene therapy provides exciting and promising advances in the prevention of HD.The silencing of mutant genes provides an opportunity for treatment.This could either restore function by returning to normal neuronal circuits that are dysfunctional but not dead or could be neuroprotective with a lack of manifestation of the disease. Quantitative measures

of brain regions such as striatum are good biomarkers for disease progression and are useful in the upcoming gene therapy studies.

New therapies under investigation: Pharmacological agents that are being studied include those that inhibit apoptosis, excitotoxicity, HTT aggregation as well as HTT proteolysis and phosphorylation, and oxidative damage. Compounds that modulate transcription, mitochondrial activity, and chaperone activity are also being investigated. Treatment options that have shown improvements in preclinical animal models and that have advanced to clinical trials include the following: minocycline, memantine, sodium butyrate, phosphodiesterase 10a inhibitor. Experimental therapies include pridopidine, laquinimod as well as a semaphorin-4D neutralizing antibody that are still in development (Fang F, Peng T, Yang S, Wang W, Zhang Y.,2016). Gene silencing to target the cause of HD has been shown to be safe in preclinical animal studies. These aim to either silence all HTT expression non-selectively or selectively for the mutated HTT allele. Cell transplantation has shown variable results and safety, as well as the efficacy of intravenously injecting mesenchymal stem cells, is being tested. Recent studies suggest that the mutated HTT gene can spread into the allografted neural tissue (Banerjee M, Datta M, Bhattacharyya NP.,2017).

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Kongre 16 Ocak 2020 Akademik Teşvik Ödeneği Yönetmeliğine getirilen “Tebliğlerin sunulduğu yurt içinde veya yurt dışındaki etkinliğin uluslararası olarak nitelendirilebilmesi için Türkiye dışında en az beş farklı ülkeden sözlü tebliğ sunan konuşmacının katılım sağlaması ve tebliğlerin yarıdan fazlasının Türkiye dışından katılımcılar tarafından sunulması esastır.” değişikliğine uygun düzenlenmiştir.

Bilgilerinize arz edilir,

Saygılarımla



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