

TOKYO SUMMIT - VIII

INTERNATIONAL INNOVATIVE STUDIES & CONTEMPORARY SCIENTIFIC RESEARCH CONGRESS

January 12-14, 2024 / Tokyo - Japan

EDITOR

Dr. Sandra Trzcińska

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H3- Dr.Tugba ÇELİKDEMİR ekranı görüntüleyorsunuz | Seçenekleri Görüntüle | Giriş yapın | Kapat

Ev Kazalarında İlk Yardım Ölçetkili Etkililik Ölçeği

- Geliştiren; **Weï ve ark.** (2013) (5)
- Türkiye geçerlilik ve güvenilirliğini yapan. Altundağ ve ark. (2021) (6)
- 12 sorudan oluşmakta olan 5'li likert tipi ölçek.
- Puanlama; min=12 max=60
- Yüksek puanlar ilk yardım konusunda daha iyi öz etkililiğini olduğunu gösterir

(5) Weib YL, Chen LL, Li TC, Ma WS, Peng NH, Huang LC. Self-efficacy of first aid for home accidents among parents with 0- to 4-year-old children at a metropolitan community health center in Taiwan. *Accid Anal Prev*. 2013;52:162-7

(6) Altındağ S, Turan T, Şafak M. Ev kazalarında İlk Yardım Öz-Yeterlik Ölçeği'nin Türkiye geçerlik ve güvenirlik çalışması. *Cukurova Med J* 2020;45(1):71-78 DOI:10.17828/cmj.6253645

Self-efficacy of first aid for home accidents among parents with 0-children at a metropolitan community health center in Taiwan

Yu-Wai Wei^a, Li-Li Chen^{b,c}, Tsai-Chung Li^d, Wei-Fen Ma^{b,c}, Niang-Huei Peng^e, Li-Chi Hsu^f

^aCommunity Health, National Public Health Center, Taichung, Taiwan
^bSchool of Nursing, China Medical University Hospital, Taiwan
^cDepartment of Nursing, China Medical University Hospital, Taiwan
^dGraduate Institute of Education, China Medical University, Taiwan
^eNursing College, Central Taiwan University of Science and Technology, Taiwan

Maddeler	X	SS	Cronbach's Alfa
Bir kazayla karşılaşıldığında 112'yi nasıl arayıp çağıracağımı bilirim.*	3.04	0.74	0.84
Bir çocuk veya eli yaralı kaza geçiriyorsa yardıma müdahale etme, ebaciden çıkarma, sırtı kaldırma, yarayı kapama ve hastaney'e gönderme işlemini yapabilirim.	3.14	1.04	0.84
Bir çocuk boğazladığında ilk yardım yapılabılır (Heimlich metodu).	1.64	1.43	0.83
Bir çocuk nefes almıyorsa nasıl sunifeksiyon yapabilirim.	1.52	1.47	0.83
Bir çocuğun kalbi stopajına kalp masajı (CPR) yapılabılır.	1.04	1.27	0.82
Bir çocukta kemik kırılması olduğunda yaralı bölgeye müdahale edilebilir.	1.34	1.50	0.82
Bir çocuğun yanarlama olduğunda yaralıya müdahale edilebilir.	3.15	1.14	0.83
Bir çocuğun burnu kanadığında kanamayı durdurabiliriz.	3.10	1.16	0.83
Bir çocukta kan kamasını/kurum olmasında yaralı bölgeye müdahale edilebilir.	1.87	1.43	0.83
Küçük bir çocuk boğazladığında ilk yardım uygulanabilir.	1.26	1.30	0.82
Bir çocuğu yakaladıysa bir şey yutmuşsa doğru metotları uygulayabilirim.	2.24	1.33	0.83
Bir kaza olduğunda bir çocuğun yanarlama derecesini tespit edebilirim.	1.74	1.29	0.83
Toplam Cronbach alfa			.86

* 112, Türkiye'de acil telefon numarasıdır.

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Kaydediliyor...

Griş yapın

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<div>Selçuk UTAŞ</div>	<div>Aynur Haşimova</div>	<div>Erhan Gungör</div>	<div>Aliya Amanzhol</div>
<div>Shamo Tapdıqov</div>	<div>Gerenfil Shahsv...</div>	<div>H1-Fatma Merve...</div>	<div>Mümine iPhone'u</div>
	<div>Gerenfil Shahsvarova</div>	<div>H1-Fatma Merve Ugur...</div>	<div>Mümine iPhone'u</div>
	<div>S-1 / H-1 Sibel A...</div>	<div>Dr. Berat ÇINAR...</div>	
	<div>S-1 / H-1 Sibel Araz</div>	<div>Dr. Berat ÇINAR ACAR</div>	

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14 Katılımcılar

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Ekrana paylaşt

Kaydı Duraklat/Durdur

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Oturandan Çık

Zoom Конференция - Hall-7

Ваша презентация: Tokyo 8th International Conference on Innovative Studies & Contemporary Scientific Research Congress

Мастерские инструменты

Observer Hall-07

Observer Hall-07

Hall-7-Dr. Ogretim Öyesi...

Hall-7-Yasemin Topçu

Hall-7-Ece Örtak

Ömer Ömürk H7 - S1

S-1 / H-7 Berk K...

S-1 / H-7 Berk Küçük

Участники (8)

Найти участника

Observer... (Сопрезидент, и)

H-7, Moses Adeolu AGOI

S-1/H-7-Dr. Ogretim Öyesi Seda Ş...

H-7, Moses Adeolu AGOI

Hall-7-Yasemin Topçu

H-7-Ece Örtak

Ömer Ömürk H7 - S1

Ramazan Gülmez

S-1 / H-7 Berk Küçük

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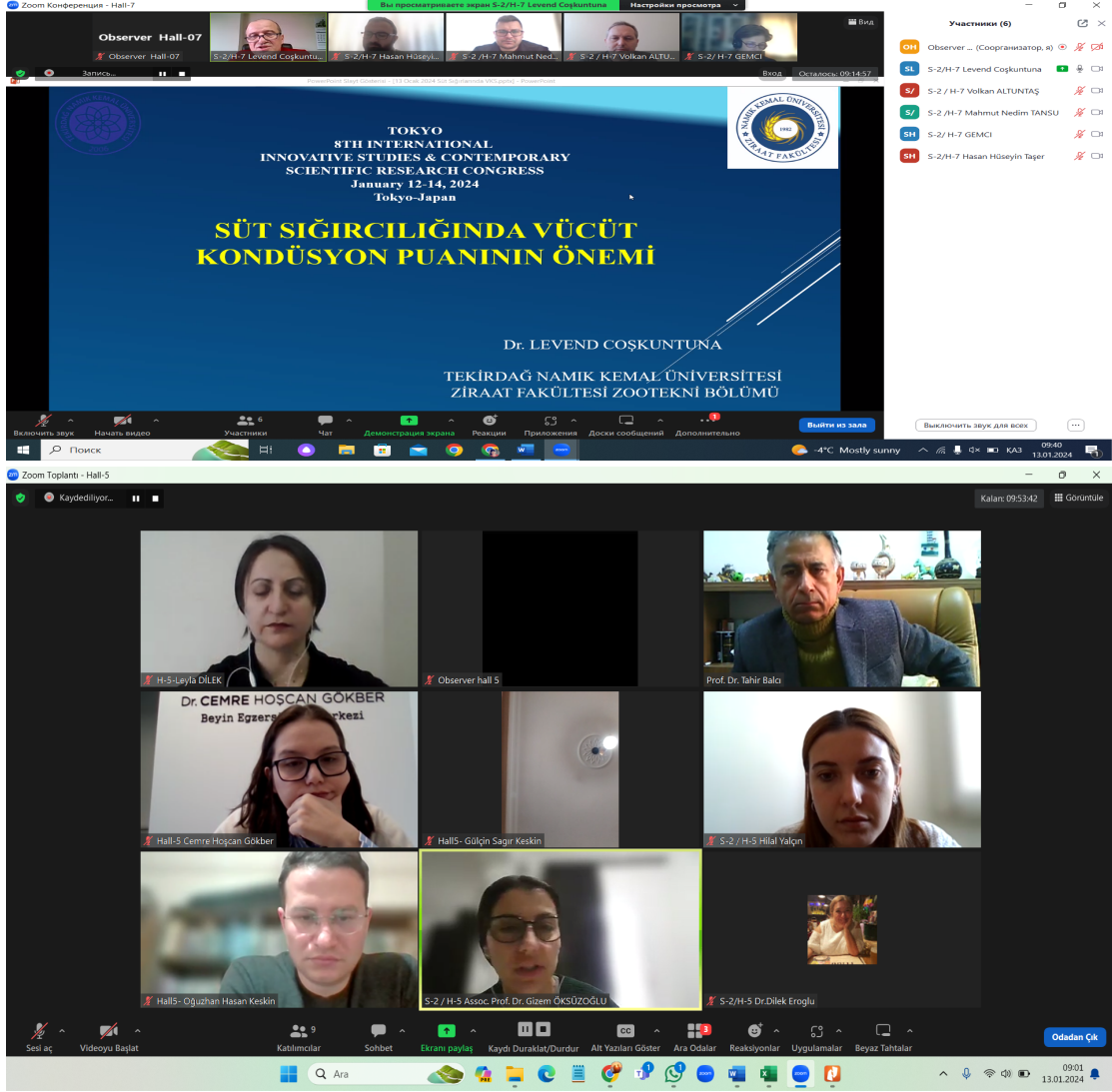


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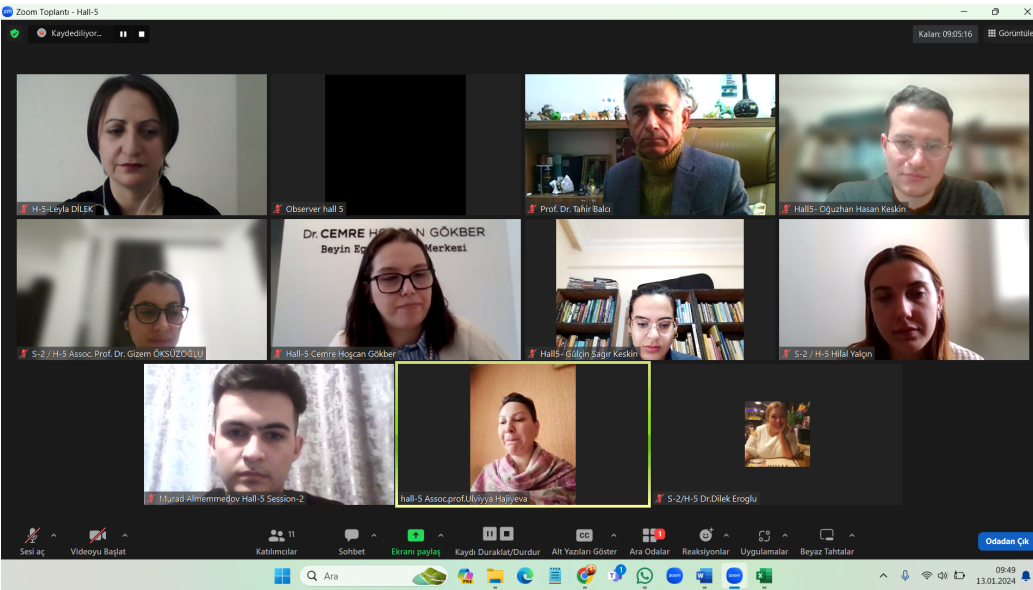
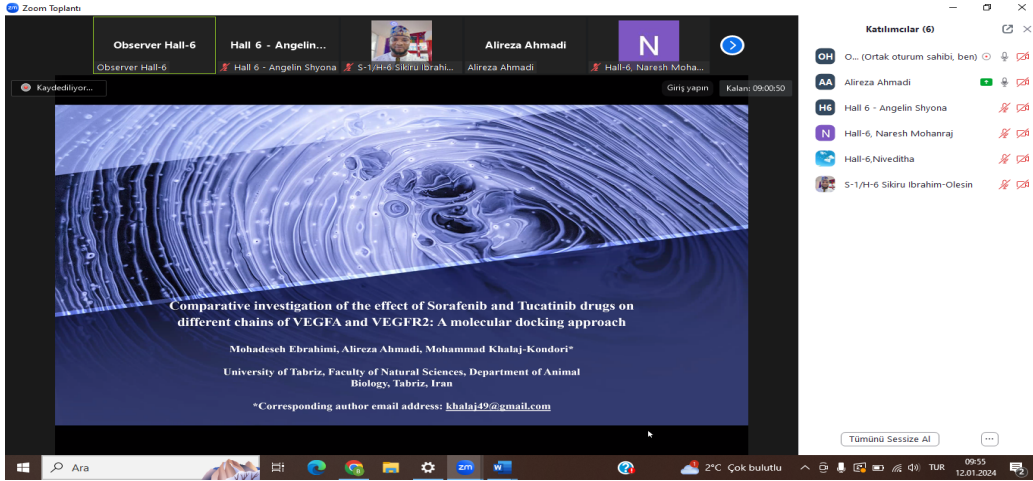
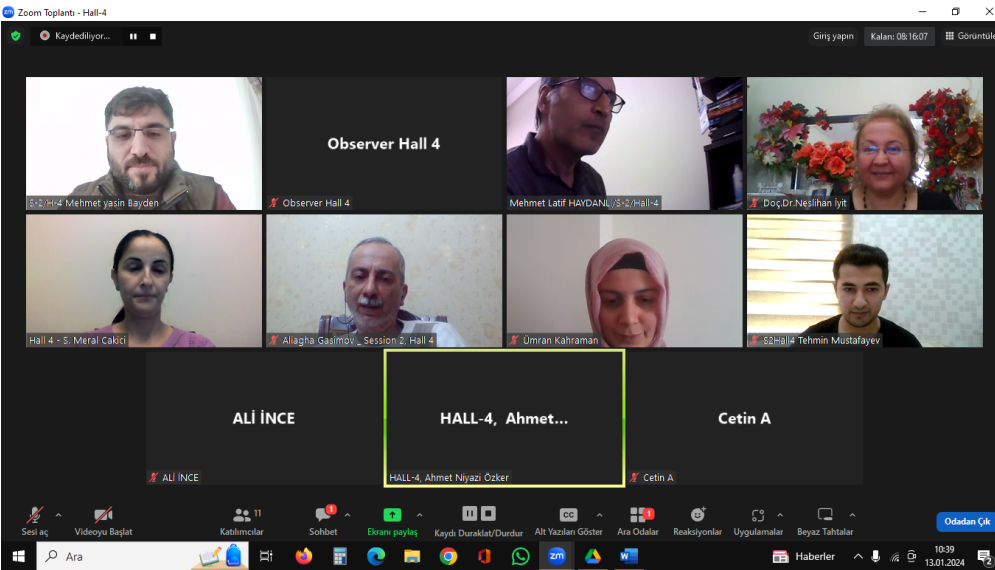
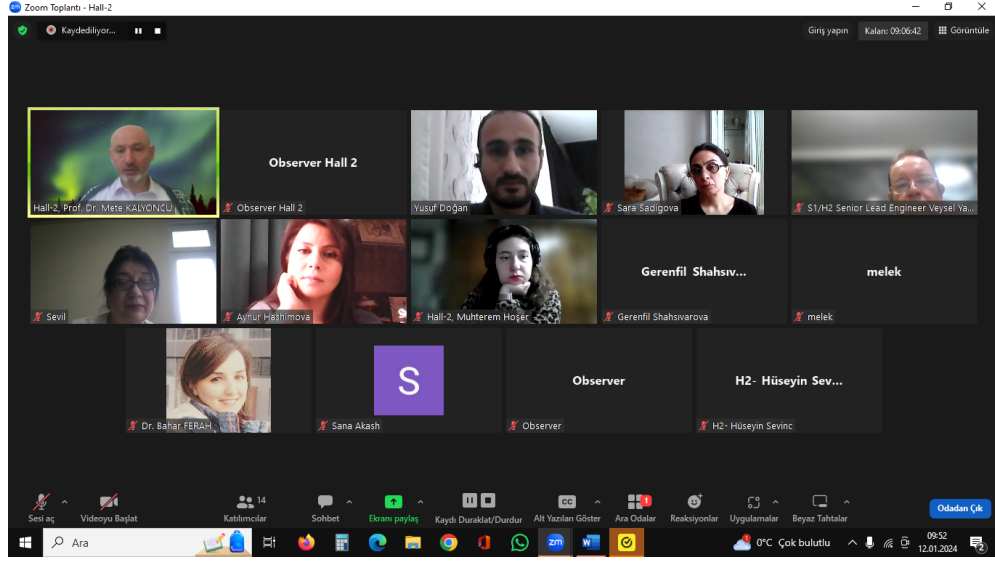


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TOKYO SUMMIT - VIII

Tokyo 8th International Conference on Innovative Studies & Contemporary Scientific Research Congress

January 12-14, 2024

Tokyo - Japan

CONFERENCE PROGRAM



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exp. S-1 / H-1 Asst. Prof. Atacan AKGÜN**

Participants Countries: 19

Türkiye, Azerbaijan, Netherlands, India, Nigeria, Pakistan, Iran, Morocco, Algeria, Georgia, Saudi Arabia, Vietnam, Poland, Spain, Hong Kong, Congo Brazzaville, Italy, Philippines, Argentina

Total number of accepted papers from Türkiye: 61
Total number of accepted papers other countries: 67



Tokyo

12.01.2024 | SESSION-1 | HALL-1



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Prof. Dr. Hatice Hilal YÜCEL (KURT)

Prof. Dr. Hatice Hilal YÜCEL (KURT) Selçuk UTAŞ Erhan ONGUN	Gazi University, Türkiye	XENON LASER PLASMAS WITH LEAD ZIRCONIUM TITANATE (PZT) CATHODE
Sibel ARAZ	İstanbul Technical University, Türkiye	MLM-TYPE STRUCTURED LIPID PRODUCTION FROM OLIVE OIL AND LAURIC ACID
Aliya Kuandykkyzy AMANZHOL Prof. Dr. Ozcan YALCINKAYA Dr. Berat CINAR ACAR Prof. Dr. Zehranur YUKSEKDAG	Gazi University, Türkiye	REMOVAL OF Cr (III) FROM SYNTHETIC SOLUTION USING UNTREATED PERLITE
Prof. Dr. Şeçil Şatır Fatma Merve Uğur	Fatih Sultan Mehmed Vakıf University, Türkiye İstanbul University, Türkiye	TURKISH AND JAPANESE TEA CULTURE AND SPACES
Asst. Prof. Selman SEVİNDİK Asst. Prof. Atacan AKGÜN Res. Asst. Nurbanu ŞAHİN Res. Asst. Dr. Ömer Faruk BAYRAM Res. Asst. Dr. Fulya ATARER	Erciyes University, Türkiye	TOWARDS NET-ZERO: A COMPREHENSIVE DATA- DRIVEN FRAMEWORK OF CIRCULAR ECONOMY PRINCIPLES IN ARCHITECTURAL DESIGN
Asst. Prof. Atacan AKGÜN Asst. Prof. Selman SEVİNDİK Res. Asst. Dr. Ömer Faruk BAYRAM Res. Asst. Dr. Fulya ATARER Res. Asst. Nurbanu ŞAHİN	Erciyes University, Türkiye	SUSTAINABLE WORKFORCE IN THE CONSTRUCTION INDUSTRY: A COMPREHENSIVE EXAMINATION OF ARCHITECTS' AND ENGINEERS' PERSPECTIVES
Saadat HUMBATOVA Assoc. Prof. Samira MAMMADOVA Assoc. Prof. Shamo Tapdiqov Jamila GULIYEVA	Ministry of Science and Education of Azerbaijan Republic SOCAR Oilgasresearchproject Institute, Azerbaijan	MASS GRADIENT STUDY OF POLYACRYLAMIDE/Fe ₃ O ₄ MAGNETITE NANOPARTICLE ADDED CONCRETE IN CASPIAN SEA WATER
Erhan ONGUN Prof. Dr. Hatice Hilal YÜCEL (KURT)	Gazi University, Türkiye	MODELING AND SIMULATION OF DC GLOW DISCHARGES IN THE ZINC SELENIDE- ARGON/HYDROGEN MICROPLASMA SYSTEM
Erhan ONGUN Prof. Dr. Hatice Hilal YÜCEL (KURT)	Gazi University, Türkiye	INVESTIGATION OF DIRECT CURRENT MICRO GLOW DISCHARGE PLASMA IN THE MODIFIED ZINC SELENIDE- ARGON SYSTEM



Tokyo

12.01.2024 | SESSION-1 | HALL-2



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Prof. Dr. Mete KALYONCU

Muhterem HOSER Assist. Prof. Dr. Bahar FERAH	Istanbul Sabahattin Zaim University, Türkiye	PARASITE ARCHITECTURAL APPROACH IN THE CONCEPT OF PALIMPSEST: THE EXAMPLE OF ESMA SULTAN MANSION IN ISTANBUL
Assist. Prof. Dr. Bahar FERAH Sana AKASH	Istanbul Sabahattin Zaim University, Türkiye	ANALYSIS OF SPATIAL QUALITIES OF GAZIANTEP NATIONAL GARDENS THROUGH PPS'S PLACE-DIAGRAM PRINCIPLES
Res. Assist. Melek GÜNER Prof. Dr. Niyazi ÖZDEMİR	Fırat University, Türkiye Batman University, Türkiye	SHAPE MEMORY POLYMER COMPOSITES AND BIOMEDICAL APPLICATIONS
Senior Lead Engineer Veysel YAŞAR	Arcelik A.S., Türkiye	A NEW APPROACH OF FLICKER ADJUSTEMENT FOR LED TV
Prof. Dr. Hanbey HAZAR Yusuf DOĞAN Res. Assist. Dr. Hüseyin SEVİNÇ	Fırat University, Türkiye	DETERMINATION OF THE EFFECTS OF FOOD TYPE AND FEEDING REGIMEN ON THE POWER DENSITY OF MICROBIAL FUEL CELLS
Prof. Dr. Hanbey HAZAR Yusuf DOĞAN Res. Assist. Dr. Hüseyin SEVİNÇ	Fırat University, Türkiye	INVESTIGATION OF THE EFFECTS OF DIFFERENT ELECTRODE STRUCTURES ON ELECTRICAL PERFORMANCE IN MICROBIAL FUEL CELLS
Mustafa ER Prof. Dr. Mete KALYONCU	Memak Plastik Gıda Makina Sanayi Ticaret A.Ş., Türkiye Konya Technical University, Türkiye	OPTIMAL PATH SYNTHESIS OF PLANAR FOUR-BAR LINKAGES USING THE BEES ALGORITHM
Sevil LATİFOVA Sara SADİGOVA Hashimova A.İ. Shahsivarova G.A.	Sumgayit State University, Azerbaijan	CENTERS FORMED BY THE DONOR LEVEL Sb DOPING IN THE Ge-Si CRYSTAL
Aina, Y.O. Banjo, T.T. Lateef, E.O	Crawford University, Nigeria	THE BENEFICIAL ROLE OF PHYTOCHEMICALS ON OXIDATIVE STRESS: A REVIEW



Tokyo

12.01.2024 | SESSION-1 | HALL-3



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Dr. Ebru BULUT

Assoc. Prof. Dr. Muammer YILMAZ Dr. Tuğba ÇELİKDEMİR	Kütahya Health Sciences University, Türkiye	FREQUENCY OF HOME ACCIDENTS IN CHILDREN AGED 1-14 AND EVALUATION OF THEIR PARENTS FIRST AID KNOWLEDGE AND HEALTH LITERACY IN HOME ACCIDENTS: KÜTAHYA EXAMPLE
Assist. Prof. Dr. Melek ALTUNKAYA	Selcuk University, Türkiye	EVALUATING THE PROTECTIVE ROLE OF SELENIUM AGAINST CISPLATIN-INDUCED LIVER DAMAGE USING NGAL AND GALECTIN-3 BIOMARKERS
Şevval İLERİ Ezgi Zilan ŞAHİN Zekiye İrem GÖZÜBOL Assoc. Prof. Dr. Kerem TOKER	Bezmiâlem Vakıf University, Türkiye	THE EFFECT OF WORK-FAMILY CONFLICT ON ORGANIZATIONAL CYNISM: A RESEARCH ON THE HEALTH SECTOR
Zeynep Selin DEMİR Hatice Aylin KILIÇASLAN Ahmet YAZICI İsmail KILIÇASLAN Assoc. Prof. Dr. Kerem TOKER	Bezmiâlem Vakıf University, Türkiye	THE MEDIATION ROLE OF PSYCHOLOGICAL CAPITAL IN THE RELATIONSHIP BETWEEN PROACTIVE PERSONALITY AND ENTREPRENEURIAL TENDENCY
Murat SÜKUTİ Hasan Birol ÇOTUK	Marmara University, Türkiye	AUTONOMIC NERVOUS SYSTEM ACTIVITY AND RECOVERY AFTER AN OLYMPIC TRIATHLON RACE: A CASE STUDY
Dr. Ebru BULUT	Aydın Adnan Menderes University, Türkiye	THE EFFECT OF REPOSITIONING FREQUENCY DETERMINED ACCORDING TO BODY MASS INDEX ON PRESSURE INJURY DEVELOPMENT TIME: RANDOMIZED CONTROLLED TRIAL
Alparslan Dilsiz Ayşegül Türksoy Ayşegül Aydın Tanas	Atatürk University, Türkiye	TREATMENT OF GINGIVAL OVERGROWTH IN A PATIENT WITH CELIAC DISEASE: A CASE REPORT
Shirinova Lala Abbasov Mehraj Namazova Kamala Mustafayev Murad Shirinova Nargiz	Western Caspian University, Azerbaijan Ministry of Science and Education, Azerbaijan Scientific Surgery Center named after Academician M. Topchubashov, Azerbaijan MediClub Hospital. Baku, Azerbaijan Azerbaijan Medical University	PROGNOSTIC SIGNIFICANCE OF SOME BIOMARKERS IN PATIENTS WITH COVID-19
Dr. Lütfiye KADIOGLU DALKILIÇ Assoc. Prof. Dr. Semih DALKILIÇ	Fırat University, Türkiye	CYTOTOXIC ACTIVITY OF DITTRICHIA VISCOSA PLANT EXTRACT IN HEPG2 AND HEK293 CELL LINES
Dr. Lütfiye KADIOGLU DALKILIÇ Assoc. Prof. Dr. Semih DALKILIÇ	Fırat University, Türkiye	INVESTIGATION OF CYTOTOXIC EFFECTS OF TRAGOPOGON RETICULATUS ON HEPG2 AND MCF7 CELL LINES AND ANTIOXIDANT AND ANTIMICROBIAL EFFECTS AGAINST SOME MICROORGANISMS



Tokyo

12.01.2024 | SESSION-1 | HALL-4



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Prof. Irine Zarnadze, MD, MPH, PhD

Abedeh Rezaei Mohammad Khalaj-Kondori	University of Tabriz, Tabriz, Iran	INVESTIGATION OF THE MINOCYCLINE IMPACT ON THE CELL CYCLE PROGRESSION OF HUMAN MCF-7 BREAST CANCER CELLS
Youssef KHACHTIB Said BOUDA Youssef AIT BELLA Lalla Hasna ZINELABIDINE Abdelmajid HADDIOUI	Sultan Moulay Slimane University, Morocco	USE OF ISSR MARKERS FOR ASSESSING GENETIC DIVERSITY OF APPLE (MALUS X DOMESTICA) CULTIVARS GROWING IN MOROCCO
Yacine DJEGHADER Nora DAOU Fethi CHOUAF Omar Feddaoui	University of Mohamed-Cherif Messaadia, Algeria Hassan First University, Morocco LEER Laboratory University of Mohamed-Cherif Messaadia, Algeria	POWER QUALITY ENHANCEMENT USING UNIFIED POWER QUALITY CONDITIONER (UPQC) CONTROLLED BY NONLINEAR CONTROLLER
Dr. Samarjit ROY Prof. Dr. Debashis DE	Dr. Sudhir Chandra Sur Institute of Technology and Sports Complex, India	DEW COMPUTING IN 5G INTERNET OF MUSIC THINGS
Kawu Yakubu	Nigerian Building and Road Research, Institute, NBRRI, Nigeria	ASSESSMENT OF HORIZONTAL WELL PERFORMANCE
Prof. Shalva Zarnadze, MD, MPH, PhD Prof. Irine Zarnadze, MD, MPH, PhD	TSSU, Tbilisi, Georgia	HEALTH PROMOTION STRATEGY FOR THE PURPOSE OF ESTABLISHING A HEALTHY LIFESTYLE IN GEORGIAN POPULATION
Ramin Aslani Ghazal Mirzaei Mahsa Mirzaei Fatemeh Golriz Ebrahim Molaee-Aghaee	Tehran University of Medical Sciences, Iran University of Tehran, Iran	EXPOSURE TO POLYCHLORINATED BIPHENYLS (PCBS) FROM FISH CONSUMPTION: EFFECTS ON HUMAN HEALTH
Mamoun Lyes Hennache Ali Hennache	Yildirim Beyazit University (AYBU), Türkiye Imam Mohammad Ibn Saud Islamic University (IMSIU), Saudi Arabia	ENHANCING THE IMPORTANCE OF POWER FACTOR CORRECTION BY EXPLORING SOME CONCEPTS RELATED TO STANDARDS THD AND PFC
Bashir, M.B Ndaghu, A.A	Ahmadu Bello University, Nigeria Modibbo Adama University Yola, Nigeria	PASTORALISTS' SOURCES OF INFORMATION ON CATTLE DISEASES AND PARASITES IN NORTH EAST, NIGERIA
Jenifer Alat Stephen	Tashkent Medical Academy, Uzbekistan	POLITICAL POLARIZATION AND ITS IMPACT ON DEMOCRACY



Tokyo

12.01.2024 | SESSION-1 | HALL-5



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Dr. Tatiana Marisel Pizarro

Abdelaziz Ait Addi	Ibn Zohr University, Morocco	EFFICIENT NANOCOMPOSITES WITH SUNLIGHT RESPONSIVENESS (GCN/BC/AW) FOR THE PHOTOCATALYTIC REMOVAL OF DYE COMPOUNDSBRAHIM ENNASRAOUI
Aleyomi Timileyin Paul	Kaduna State University, Kaduna, Nigeria	MILITARY AND INTERNAL SECURITY OPERATIONS IN THE NORTH CENTRAL ZONE OF NIGERIA
Dr. Tatiana Marisel Pizarro	National University of San Juan, Argentina	SOCIODISCURSIVE REPRESENTATIONS IN THE DEBATE OF THE BILL OF HISTORIC REPARATION FOR TRANSVESTITES AND TRANS ELDERLY PEOPLE IN ARGENTINA
Dr. Farzad Rassaei	Islamic Azad University, Iran	BIOCHAR APPLICATION TO ENHANCE PLANT GROWTH, MITIGATE HEAVY METALS POLLUTION, AND REDUCE METHANE EMISSIONS: A COMPREHENSIVE REVIEW
Alexis Matel D. Carlos	Polytechnic University of the Philippines, Philippines	THE DEPARTMENT OF ENERGY'S TRAINING AND DEVELOPMENT PRACTICES: A PROSPECT FOR ENHANCED HUMAN RESOURCE DEVELOPMENT AGENDA
Sowmya Sridhar	R.M.K Engineering College, India	MEMA -MEDICAL EMERGENCY AND MANAGEMENT APPLICATION
Marilena Carbone	University of Rome Tor Vergata, Italy	CQDs@NiO: AN EFFICIENT TOOL FOR METHANE SENSING
Varsha S, B.E	R.M.K Engineering College, India	STOCK PRICE PREDICTION USING MACHINE LEARNING
Brel Grâce Mangalala	Université Marien Ngouabi, Congo-Brazzaville	KWAME NKRUMAH'S CONTINENTAL VISION FOR THE UNIFICATION OF AFRICA
Sowmya Sridhar	R.M.K Engineering College, India	VIRTUAL VOICE ASSISTANT MAX



Tokyo

12.01.2024 | SESSION-1 | HALL-6



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Assoc. Prof. Dr. Rozina Khattak

A. Niveditha K. Lavanya S. Keerthika M.V. Silpa V. Sejian	Rajiv Gandhi Institute of Veterinary Education and Research, India	GENES GOVERNING COAT COLOUR CHARACTERISTICS FOR IMPARTING CLIMATE RESILIENT POTENTIAL IN GOATS
M.Naresh P.Lokesh M.V.Silpa V. Sejian	Rajiv Gandhi Institute of Veterinary Education and Research, India	ANTIOXIDANT SUPPLEMENTATION TO RELIEVE HEAT STRESS IN SHEEP
Aravindh S Angelin Shyona Darwin E Sejian V	Rajiv Gandhi Institute of Veterinary Education and Research, India	CLASSICAL HEAT SHOCK PROTEINS DETERMINING THERMO-TOLERANCE IN SHEEP
E. Angelin Shyona Darwin Aravindh.S V. Sejian	Rajiv Gandhi Institute of Veterinary Education and Research, India	QUANTITATIVE EXPRESSION PATTERN OF MEAT QUALITY GOVERNING GENES IN HEAT STRESSED SHEEP
Ibrahim-Olesin, Sikiru Adefalu, Lawal Lateef Emeka, Chidiebere Prince Osuji Izuogu, Chibuzo Uzoma, Olaitan, Tunde Rafiu Mohammed, Sanni Bashir	Alex Ekwueme Federal University, Nigeria University of Ilorin, Nigeria	EFFECTS OF CLIMATE CHANGE ON PESTS AND DISEASES OF SELECTED CROPS; IMPLICATION FOR AI-DRIVEN TECHNOLOGIES
Assoc. Prof. Dr. Rozina Khattak	Shaheed Benazir Bhutto Women University, Pakistan	BIOCOMPOSITE BASED ON POLYMER AND DRY FRUIT WASTE FOR TOXIC DYE REMOVAL TO TREAT WASTEWATER
Assoc. Prof. Dr. Rozina Khattak	Shaheed Benazir Bhutto Women University, Pakistan	HOMOGENOUS CATALYSIS BY TERT-BUTANOL FOR SENSITIZER-MEDIATOR ELECTRON TRANSFER IN WATER
Alireza Ahmadi Mohadeseh Ebrahimi Mohammad Khalaj-Kondori	University of Tabriz, Tabriz, Iran	MIR-320A TARGETS JAK/VEGFA AXIS COMPONENTS IN NON-SMALL CELL LUNG CANCER: A BIOINFORMATIC TARGETOME EVALUATION
Mohadeseh Ebrahimi Alireza Ahmadi Mohammad Khalaj-Kondori	University of Tabriz, Tabriz, Iran	COMPARATIVE INVESTIGATION OF THE EFFECT OF SORAFENIB AND TUCATINIB DRUGS ON DIFFERENT CHAINS OF VEGFA AND VEGFR2: A MOLECULAR DOCKING APPROACH



Tokyo

12.01.2024 | SESSION-1 | HALL-7



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Assist Prof. Dr. Seda SAHİN

Assist Prof. Dr. Seda SAHİN Ramazan GÜLMEZ Baris YILDIZ	Çankırı Karatekin University, Türkiye	EARTHQUAKE-INDUCED BUILDING DAMAGE DETECTION USING SATELLITE IMAGES WITH ARTIFICIAL INTELLIGENCE
Assist Prof. Dr. Seda SAHİN Mustafa Kemal AYDIN Berk KÜÇÜK	Çankırı Karatekin University, Türkiye	A NEW RENEWABLE ENERGY EFFICIENCY FORECASTING SYSTEM FOR SUMMERHOUSES
Ömer ÖZTÜRK	Azerbaijan Technical University, Azerbaijan	HIGH TECHNOLOGY CONNECTIONS IN AVIONICS SYSTEMS
Yasemin TOPÇU Assoc. Prof. Turan ERDEN	Istanbul Technical University, Türkiye	GIS-BASED MULTICRITERIA SITE SELECTION FOR DETERMINING RETAIL STORE LOCATIONS
Ece ORTAK Assoc. Prof. Dr. Ahmet Özgür DOĞRU	Istanbul Technical University, Türkiye	GIS BASED SITE SELECTION MODEL FOR PARCEL LOCKERS: A CASE STUDY IN ISTANBUL
Moses Adeolu AGOI Oluwanifemi Opeyemi AGOI Solomon Abraham UKPANAHI	Lagos State University of Education, Nigeria Obafemi Awolowo University, Nigeria	A MIXED REVIEW ON ETHICAL AND SECURITY ISSUES OF ARTIFICIAL INTELLIGENCE (AI) TECHNOLOGY
Odugbemi Wasiu Olayinka	Federal College of Education, Nigeria	USING COMPUTER-ASSISTED INSTRUCTION TO IMPROVE STUDENTS' ACADEMIC PERFORMANCE IN WOODWORK TECHNOLOGY
Yousra Taoudi Hicham Oudghiri Hassani Souad Rakass Mohammed Lachkar	Sidi Mohamed Ben Abdellah University, Morocco	SYNTHESIS AND CHARACTERIZATION OF METAL MOLYBDATE NANOPARTICLES AND ITS APPLICATION IN THE REDUCTION REACTION OF THE THREE ISOMERS OF NITROPHENOL
Dr Ameur Belmouhoub Prof. Dr. Assia Abdelouahed	21 Aout 1955, Technical Science, Algeria	PERFORMANCE OF SELF-PLACING CONCRETE BASED ON RUBBER AGGREGATES RECYCLED. A REVIEW
Habeeb Salman ISIAKA Hawawu Kewudoyin ABDUSSALAM Bale Muritala ISSA	Kwara State University, Nigeria	IDENTIFICATION AND PATHOGENICITY DETERMINATION OF FUNGI RESPONSIBLE FOR SPOILAGE IN STORED ORANGES (CITRUS SINENSIS) IN IPATA MARKET, ILORIN, NIGERIA



Tokyo

13.01.2024 | SESSION-2 | HALL-1



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Assoc. Prof. Dr. Mahmut DİNGİL

Prof. Dr. Mitat UYSAL Prof. Dr. S. Aynur UYSAL Res. Assist. Nurdanur PEHLİVAN M. Ozan UYSAL	Doğuş University, Türkiye AppCent, Türkiye	COMPARISION OF FOUR NATURE INSPIRED MATEHEURISTIC OPTIMIZATION FUNCTIONS
Asst. Prof. İsmail Kutlugün AKBAY Asst. Prof. Habibe Elif GÜLŞEN AKBAY	Mersin University, Türkiye	UTILIZATION OF OKRA PROCESSING WASTE AS OKRA GUM: EXTRACTION AND PURIFICATION
Assoc. Prof. Dr. Mahmut DİNGİL Assist. Prof. Dr. Gamze GÜLŞEN BAKICI Assoc. Prof. Dr. Deniz Mutlu ALA	Çukurova University, Türkiye	INVESTIGATION OF THE SPATIAL VARIATION OF WATER REPELLENCY IN COTTON AND POLYESTER FABRIC TYPES USING IMAGE CLASSIFICATION METHOD
Dr. Hamid Zamanlou Assist. Prof. Filiz Karabudak	Ataturk University, Türkiye Gumushane University, Türkiye	INTEGRATION OF FINITE ELEMENT ANALYSIS AND ARTIFICIAL INTELLIGENCE FOR OPTIMIZING PATIENT- SPECIFIC BIOMECHANICAL IMPLANTS WITH CONSIDERATION OF FATIGUE PERFORMANCE
Hümeyra AKBAYIR Dr. Mahsa HAKKI	İstanbul Sabahattin Zaim University, Türkiye	EXAMINATION OF DETERMINING AND LIMITING ELEMENTS IN ARCHITECTURAL SPACES
Mümine Yıldır Dr. Bedriye Ucpinar Durmaz Prof. Dr. Ayse Aytac	Kocaeli University, Türkiye	THE PREPARATION AND CHARACTERIZATIONS OF BIODEGRADABLE POLY (BUTYLENE SUCCINATE) (PBS) AND SODIUM CASEINATE (NACAS) BLENDS FOR PACKAGING APPLICATIONS
Prof. Fuad VELIYEV Aida ASLANOVA	Baku Higher oil School, Baku, Azerbaijan	THE INVESTIGATION OF RHEOPHYSICAL PROPERTIES OF FLUID FLOW IN MICROCHANNELS
Huseynzade Gulare	Ministry of Science and Education, Azerbaijan	THE R PROGRAMMING LANGUAGE CAN BE A USEFUL TOOL IN THE FIELD OF TOMATO CULTIVATION IN AZERBAIJAN



Tokyo

13.01.2024 | SESSION-2 | HALL-2



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Assist. Prof. Dr. Ayşe Meriç YAZICI

Assist. Prof. Dr. Ayşe Meriç YAZICI	İstanbul Gelişim University, Türkiye	THE EFFECTS OF BIOMIMICRY APPLICATIONS ON LEADERSHIP AND STRATEGY IN ORGANIZATIONS
Assist. Prof. Dr. Alptuğ AKSOY Res. Assist. Dr. Bilgen Gaye YALPA	Fırat University, Türkiye Osmaniye Korkut Ata University, Türkiye	TEMPORAL FLUIDITY IN MODERN ORGANIZATIONS: RECONCEPTUALIZING TIME IN DECISION-MAKING AND STRATEGY FORMULATION
Assoc. Prof. Dr. İlke CİRİTÇİ Asist. Prof. Dr. Semih Göksel YILDIRIM	İstanbul Gelişim University, Türkiye	TEMPORARY HOUSING DESIGN FOR POST-EARTHQUAKE IN ISTANBUL; LESSONS LEARNED FROM JAPAN
Dr. Aysel DOĞAÇ Prof. Dr. Faruk KALAY	Van Yuzuncu Yıl University, Türkiye	MIDDLE-AGED WOMEN IN BUSINESS LIFE
Dr. Bedriye Gizem Tekin Dr. Erençül Pektaş Prof. Dr. Mehtap Akdoğan	25 Aralık State Hospital, Gaziantep, Türkiye Sanko University Medical School, Türkiye	HYPERCALCEMIC CRISIS DUE TO PRIMARY HYPERPARATHYROID: A CASE REPORT
Dr. Azamat AMETOV	Almaty Otizm Merkezi, Kazakistan	THE USE OF THE ELECTROENCEPHALOGRAM (EEG) BETA RANGE AS A DYNAMIC BIOMARKER FOR ASSESSING THE SEVERITY OF AUTISTIC SYMPTOMS
Beril GÖK, RA Benan GÖK TAFLI, PhD	Bahçeşehir University, Türkiye Vrije Universiteit Amsterdam, Netherlands	UNSEEN ARCHITECTS, UNHEARD NARRATIVES: REFRAMING WORK-LIFE BALANCE THROUGH THE LENS OF MIGRANT WOMEN PROFESSIONALS
Assist. Prof. Dr. Bahar HOŞCAN Res. Assist. Dr. Gülce Sevi Özsoy	Trakya University, Türkiye Trakya University, Türkiye	A FRESH BREATH OF AIR: ANTONIA LOUISA BRICO THE RIGHT HAND TECHNIQUE



Tokyo

13.01.2024 | SESSION-2 | HALL-3



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Ben O. Johnson

Ben O. Johnson	Federal University, Nigeria	NUMERICAL INVESTIGATIONS INTO THE PRIMITIVITY AND SOLUBILITY OF DIHEDRAL GROUPS OF DEGREES 4P AND THAT ARE NOT P-GROUPS
Khadija Elkhalloufy Khalid Hilal Ahmed Kajouni	Sultan Moulay Slimane University, Morocco	A SOLUTION SEMIGROUP TO A CONFORMABLE PARTIAL DIFFERENTIAL EQUATION
Assoc. Prof. Dr. Tien Dung KHONG Le Thai Hanh BUI Khanh Ngoc TRAN	Can Tho University, Vietnam	THE DETERMINANT OF INTENTION TO USE ONLINE FOOD DELIVERY SERVICES IN MEKONG DELTA VIETNAM
Precious Oluwatofunmi Gbenga Abdulkabir Opeyemi Bello Ekundayo Adesina Aliyyu Abiola Abdulraheem	Federal University of Technology, Nigeria University of Abuja, Nigeria	AN EXAMINATION OF WOMEN PARTICIPATION IN THE CONSTRUCTION INDUSTRY: A SYSTEMATIC LITERATURE REVIEW
Suleiman Adebayo Nasiru Rasheed Babatunde Isa Abdulkabir Opeyemi Bello	Federal University of Technology, Nigeria	PUBLIC-PRIVATE PARTNERSHIPS IN AFFORDABLE HOUSING PROVISION: A SYSTEMATIC LITERATURE REVIEW
L.Diana R. Devi Dr. R. Srinivasan	Bharath Institute of Higher Education and Research, India	BILIRUBIN NANOMEDICINE -A HOPE FOR THE MANAGEMENT OF COVID-19?
A.Ashwini R.Deviraman Dr.R.Srinivasan	Bharath Institute of Higher Education and Research, India	MEDICATION SAFETY AND ERROR PREVENTION
V. Varalakshmi R.Devi Dr. R. Srinivasan	Bharath Institute of Higher Education and Research, India	A SHORT REVIEW ON APPLICATION OF NANOMATERIALS IN THE TREATMENT OF RHEUMATOID ARTHRITIS



Tokyo

13.01.2024 | SESSION-2 | HALL-4



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Prof. Dr. Ahmet Niyazi ÖZKER

Mehmet Latif HAYDANLI	Dokuz Eylül University, Türkiye	POSSIBLE EFFECTS OF ARTIFICIAL INTELLIGENCE ON THE GLOBAL ECONOMY IN THE CONTEXT OF KONDRATIEFF WAVES
Assoc. Prof. Dr. S. Meral ÇAKICI	Piri Reis University, Türkiye	MONETARY POLICIES IN THE AFTERMATH OF THE GREAT RECESSION
Prof. Dr. Ahmet Niyazi ÖZKER	Bandırma Onyedi Eylül University, Türkiye	DYNAMIC APPEARANCE OF PERSONAL INCOME TAX PROGRESSIVITY AND POST-IMPLICATIONS TOPICAL ALTERATIONS IN GLOBAL EXPECTATIONS
Assoc. Prof. Dr. Neslihan İYİT Assist. Prof. Dr. Ümran Münire KAHRAMAN Ali İNCE	Selçuk University, Türkiye Necmettin Erbakan University, Türkiye KuveytTurk Participation Bank Inc., Türkiye	FINANCIAL PERFORMANCE COMPARISON OF PARTICIPATION BANKS VERSUS CONVENTIONAL BANKS DURING THE PANDEMIC PERIOD IN TURKEY BY DATA ENVELOPMENT ANALYSIS
Mustafayev Tahmin Tahmasib Ramazanova Ayten Shahinova	Azerbaijan University of Languages	CAUSES OF THE GLOBAL ECONOMIC FINANCIAL CRISIS AND CHOOSING ANTI-CRISIS MEASURES
Khasayeva Sevinj Siracova Saida Gurbanova Fidan	Azerbaijan State Economic University	CONSEQUENCES OF DAMAGE TO KARABAKH RIVERS AND RESERVOIRS
Natavan Baymammadli Aliagha Gasimov	Azerbaijan State University of Economics	INCREASING RESEARCH AND DEVELOPMENT ACTIVITIES OF ENTERPRISES IN ORDER TO IMPROVE THEIR PRODUCTIVITY AND EFFICIENCY
Mehmet Yasin BAYDEN Assoc. Prof. Dr. Adnan ÇETİN	Van Yüzüncü Yıl University, Türkiye	VARIOUS CATALYSTS FOR GREEN SYNTHESIS OF PYRANOPYRAZOLES



Tokyo

13.01.2024 | SESSION-2 | HALL-5



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Assoc. Prof. Dr. Gizem ÖKSÜZOĞLU

Oğuzhan Hasan KESKİN	Sakarya University, Türkiye	THE POLITICAL CONTEXT OF ÂŞIK MAHZUNÎ ŞERİF: TURKEY IN THE 1970S
Assoc. Prof. Dr. Gizem ÖKSÜZOĞLU	Final International University, Türkiye	CONSTRUCTION OF COLLECTIVE MEMORY THROUGH OFFICIAL HISTORY EDUCATION IN CYPRUS
Leyla DİLEK	Siirt University, Türkiye	ANALYSIS OF LEB DEĞMEZ'S ART IN A SEMANTIC CONTEXT IN GAGAUZ POETRY PLANE
Dr. Cemre Hoşcan Gökber	Brain Exercise Center-Founder and Director	CREATIVE DRAMA IN EDUCATION
PhD Gasimova Mirvari	ASPU, Baku, Azerbaijan	TEACHER TRAINING IN THE GERMAN EDUCATION SYSTEM
Assoc. Prof. Ulviyya Hacıyeva	ASPU, Azerbaijan	PREPARING OF STUDY PLANS BASED ON INTERNATIONAL PRACTICE
Murad ALMEMMEDOV	The Academy Of The Public Administration Under The President Of Republic Of Azerbaijan	PACIFIC PUZZLES: EXAMINIG THE GEOPOLITICAL CHESSBOARD IN THE PACIFIC OCEAN
Gülçin Sağır Keskin	Ankara University, Türkiye	READING BOURDIEU'S CONCEPTUAL MAP THROUGH THE FILM ONE DAY SURELY
Hilal Yalçın Dr. Dilek Eroğlu	Bolu Abant İzzet Baysal University, Türkiye	CYBERFEMINISM IN TURKEY
Prof. Dr. Tahir BALCI	Çukurova University, Türkiye	NEW LINGUISTICS AND GRAMMAR TERMS



Tokyo

13.01.2024 | SESSION-2 | HALL-6



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Dr. Sandra Trzcińska

Reyhan Mirzaghayeva	Baku State University, Azerbaijan	METHODS OF PSYCHOLOGICAL CORRECTION OF DEVIANT BEHAVIOR
Dr. Sandra Trzcińska Joanna Cieplińska Anna Kopiczko Michał Kuszewski Manuel González-Sánchez	Józef Piłsudski University of Physical Education in Warsaw, Poland College of Rehabilitation, Poland Academy of Physical Education in Katowice, Poland Afilijacja: Universidad de Málaga, Spain	ASSESS THE IMPACT OF SEDENTARY HABITS AND PHYSICAL ACTIVITY LEVELS ON SPINAL CURVATURE PARAMETERS IN YOUNG ADULTS WITH POSTURAL DISORDERS AND TO VERIFY THE INFLUENCE OF TIME SPENT PASSIVELY ON THE PARAMETERS OF THORACIC KYPHOSIS AND LUMBAR LORDOSIS
Dr. Sandra Trzcińska	Józef Piłsudski University of Physical Education in Warsaw, Poland	THE CONCEPT OF KTS® (POL. KOMPENSACYJNA TERAPIA SKOLIOZ, ANG. COMPENSATORY THERAPY OF SCOLIOSES - CTS) - A NEW MODEL OF THERAPY FOR PATIENTS WITH SCOLIOSIS
Mi Feng	Hong Kong Baptist University, Hong Kong	USING NON-MARKOVIAN DYNAMICS TO UNVEIL THE MECHANISM OF EFFECTIVE COVID-19 VACCINATION STRATEGY
Mi Feng	Hong Kong Baptist University, Hong Kong	ASSESSING THE APPLICABILITY OF MARKOVIAN MODELING FOR TRANSIENT MEMORY-DEPENDENT EPIDEMIC DYNAMICS
Ramzi EL IDRISSE Abdelkabar BACHA Fatima LMAI	Hassan II University, Morocco Higher Institute of Maritime Studies (ISEM), Morocco	SIMULATION MODEL OF A SINGLE-PHASE INVERTER USING SPWM UNIPOLAR TECHNIQUE
Prof. Assoc. PhD. Anna KOPICZKO PhD. Joanna PIOTROWSKA PhD. Małgorzata JUŚIAKOWSKA-PŁPUTA PhD. Natalia BIENKO	Józef Piłsudski University of Physical Education in Warsaw, Poland Witelon Collegium State University, Poland National Institute of Public Health NIH - National Research Institute, Warsaw, Poland	OSTEOSARCOPENIA IN POSTMENOPAUSAL CAUCASIAN WOMEN: CROSS-SECTIONAL OBSERVATIONAL STUDY
Fr. Baiju Thomas	Ramakrishna Mission Vivekananda Educational and Research Institute, India	THE ROLE OF PARENTAL INVOLVEMENT IN MANAGEMENT OF BEHAVIOURAL PROBLEMS IN CHILDREN WITH INTELLECTUAL DISABILITY DURING HOME-BASED LEARNING ENVIRONMENT IN THE MODERN INCLUSIVE SOCIETY



Tokyo

13.01.2024 | SESSION-2 | HALL-7



Tokyo Local Time: 15⁰⁰-17⁰⁰



Ankara Local Time: 09⁰⁰-11⁰⁰

HEAD OF SESSION: Dr. Levend COSKUNTUNA

Assist. Prof. Dr. Volkan ALTUNTAŞ	Bursa Technical University, Türkiye	MOBILE TECHNOLOGY APPLICATION in SMART AGRICULTURE
Dr. Hüseyin Fatih ATLI	Iskenderun Technical University, Türkiye	DIGITAL MARKETING IN THE AGRICULTURAL SECTOR AND DIGITAL TRANSFORMATION IN AGRICULTURAL MARKETING
Asst. Prof. Ayse Gul GEMCI	Istanbul Sabahattin Zaim University, Türkiye	WATCHING THE SPATIAL CONTEXT OF MIYAZAKI MOVIES FROM ISTANBUL: A STUDY OF JAPANESE VERNACULAR HOUSES IN ANIME ARCHITECTURE
Oguzhan ORHAN Şener ÖZÖNDER Soner OZGEN	Fırat University, Türkiye Bogazici University, Türkiye	EFFECT OF HYDROSTATIC PRESSURE ON ELECTRONIC PHASE TRANSITIONS IN MONOLAYER VS
Dr. Levend COSKUNTUNA	Tekirdağ Namık Kemal University, Türkiye	UNDESIRABLE SITUATIONS IN SILAGE PRODUCTION
Dr. Levend COSKUNTUNA	Tekirdağ Namık Kemal University, Türkiye	THE IMPORTANCE OF BODY CONDITION SCORE IN DAIRY FARMING
Lec. Hasan Hüseyin TASER Lec. Mahmut Nedim TANSU	Istanbul Gelisim University, Türkiye	INVESTIGATION OF MECHANICAL AND THERMAL PROPERTIES OF BATTERY SYSTEMS IN HYBRID AND ELECTRIC VEHICLES
Asst. Prof. Dr. Eren Cihan Karsu Asal	Manisa Celal Bayar University, Türkiye	PROPERTIES OF LiAlSi ₂ O ₆ PHOSPHOR
Fizze Kazımova	Nahçıvan State University, Azerbaijan	FACTORS AFFECTING BRAIN DEVELOPMENT
Anwar Mallongi Stang Ernyasih	Hasanuddin University, Indonesia Universitas Muhammadiyah Jakarta, Indonesia	CALCULATING HEALTH AND ECOLOGICAL RISKS OF PM _{2.5} , AND LEAD POLLUTANTS EXPOSURE AMONG COMMUNITIES DUE TO CEMENT PLANT EMISSION, MAROS INDONESIA 2023



Tokyo

8TH INTERNATIONAL TOKYO CONFERENCE ON INNOVATIVE STUDIES OF CONTEMPORARY SCIENCES

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XENON LASER PLASMAS WITH LEAD ZIRCONIUM TITANATE (PZT) CATHODE

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ABSTRACT

Lead zirconium titanate, also known as PZT, is an inorganic compound material. It is used for ultrasonic transducers, microwave devices and piezoelectric resonators including electrical energy storage units, sensors and detectors. It is a whitish solid with piezoelectric properties that has a high operating temperature. It is ohmic up to 250 kV/cm (25 MV/m). After this value, the current increases exponentially with the field strength before reaching an avalanche value. Deterioration may occur at high temperatures and voltages. PZT is ideal for plasma systems that do not require cooling units. Xenon gas is very effective in measurements at high frequencies in the THz range. Although it is in very small amounts, it has great effects in the plasma studies. In this study, we used PZT material that placed between anode and cathode at micron distances as a detector. Thus, we shaped the laser-triggered plasma model under the influence of a xenon gas at high frequencies. We obtained plasma formation graphs depending on the cathode material. We investigated the plasma and laser system effects on the plasma characteristics at different frequencies, different trigger voltages and pressures. It is observed that plasma properties are directly related to PZT material, laser type and working gas. The role of Xenon laser on the plasma parameters are also clarified.

KEYWORDS: Xenon gas, High frequency laser systems, MDP (Microdistance plasma), $\text{PbZr}_x\text{Ti}_{1-x}$ (PZT).

MLM-TYPE STRUCTURED LIPID PRODUCTION FROM OLIVE OIL AND LAURIC ACID

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ABSTRACT

Nowadays, structured lipids meet the ever increasing need for healthy foods, preventing obesity, cancer, cardiovascular diseases etc. can be designed. Structured lipids are obtained by chemically or enzymatically changing the composition or location of glycerol-bound fatty acids. Medium-chain fatty acids (MCFAs) are included in the diets of patients with insufficient lipid absorption such as cystic fibrosis, colitis, and crohn disease to meet their nutritional needs. However, since these fatty acids alone cannot meet the body's essential fatty acid needs, recently MLM type structured lipids containing both MCFAs and long chain fatty acids (LCFAs) have been produced and included in the diets of these patients. MLM type lipids, obtained by positioning structured lipids with medium-chain saturated fatty acids (MCFAs) (M) in sn-1 and sn-3 positions and long-chain saturated or unsaturated fatty acids (LCFAs) (L) in sn-2 position, have low caloric value and are therefore used to control obesity, fat malabsorption and other metabolic diseases. Lauric acid, a medium-chain fatty acid, has antibacterial and antiviral properties. Olive oil, which is rich in oleic acid, a long-chain fatty acid, has beneficial effects on cancer, autoimmune and inflammatory diseases. In this study, the acidolysis reactions of olive oil and lauric acid at different molar ratios and times were studied by enzymatic method. It is aimed to produce MLM type lipid by adding lauric acid to olive oil. The fatty acid compositions of the resulting reaction products were determined by gas-liquid chromatography.

KEYWORDS: Structured Lipid, Enzymatic Acidolysis, Ketogenic Diet.

ZEYTİNYAĞI VE LAURİK ASİT İLE MLM TİPTE YAĞ ÜRETİMİ

ÖZET

Günümüzde, yapılandırılmış yağlar sağlıklı gıdalara karşı giderek artan ihtiyacı karşılamak ve obezite, kanser, kardiyovasküler vb. hastalıkları önlemek için tasarlanabilmektedir. Yapılandırılmış yağlar, gliserole bağlı yağ asitleri bileşiminin veya konumunun kimyasal veya enzimatik olarak değiştirilmesiyle elde edilmektedir. Kistik fibrozis, kolit, crohn hastalığı gibi yağ emiliminde yetersizlik olan hastaların diyetlerinde orta zincirli yağ asitleri (OZYA) beslenme ihtiyaçlarını karşılamak için dahil edilmektedir ancak bu yağ asitleri vücudun temel yağ asidi ihtiyacını tek başlarına karşılayamadıklarından son dönemlerde hem OZYA hem de uzun zincirli yağ asitleri (UZYA) içeren MLM tipte yapılandırılmış yağlar üretilmekte ve bu hastaların diyetlerine dahil edilmektedir. Yapılandırılmış yağların sn-1 ve sn-3 pozisyonlarında orta zincirli doymuş yağ asitleri (OZYA) (M) ile sn-2 pozisyonunda uzun zincirli doymuş veya doymamış yağ asitlerinin (UZYA) (L) konumlandırılmasıyla elde edilen MLM tipteki yağlar düşük kalori

değerine sahip olması ve bu nedenle obezite, yağ emilim bozukluğu ve/veya diğer metabolik bozuklukları kontrol etmek amacıyla kullanılmaktadır. Orta zincirli bir yağ asidi olan laurik asit antibakteriyel ve antiviral özellik gösteren bir yağ asididir. Uzun zincirli bir yağ asidi olan oleik asit açısından zengin olan zeytinyağının ise kanser, otoimmün ve inflamatuvar hastalıklar üzerinde faydalı etkileri bulunmaktadır. Bu çalışmada farklı mol oranları ve sürelerde zeytinyağı ve laurik asidin enzimatik yöntemle asidoliz reaksiyonları çalışılmıştır. Laurik asidin, zeytinyağına katılımıyla MLM tipte yağ üretimi amaçlanmıştır. Elde edilen reaksiyon ürünlerinin yağ asidi kompozisyonları gaz-sıvı kromatografisi ile belirlenmiştir.

ANAHTAR KELİMELEER: Yapılandırılmış Yağ, Enzimatik Asidoliz, Ketojenik Beslenme.

REMOVAL OF Cr (III) FROM SYNTHETIC SOLUTION USING UNTREATED PERLITE

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ABSTRACT

Perlite is a type of glass formed due to the cooling of a type of magma rock with high water content, a mineral of volcanic origin. The use of perlite in wastewater treatment and purification is essential for protecting water resources, cleaning wastewater, and ensuring environmental sustainability. In this study, raw (untreated) perlite was used as an adsorbent for the adsorption of Cr(III) ions from synthetically prepared chromium solution. Surface area and porosity analyses of the sample were performed. Adsorption studies of perlite were performed, and the batch method was used for the uptake experiments of chromium. The effect of pH, temperature, initial Cr(III) concentration, and contact time on chromium adsorption was investigated via an experimental design approach using a Central Composite Design. A pseudo first order polynomial equation related to the model was obtained, and 3 dimensioned surface contour plots were drawn. The variance analysis (ANOVA) of the model at %95 confidence level was investigated.

KEYWORDS: Perlite, Cr(III), Adsorption, Central Composite Design.

TURKISH AND JAPANESE TEA CULTURE AND SPACES

Şeçil Şatır

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ABSTRACT

Almost everywhere in the world, the tea plant, which varies according to geographical location, climatic conditions and people's cultures, is an important plant and beverage consumed as an accompaniment to conversation, from breakfast to dinner and beyond. This plant, whose Latin name is 'Camellia Sinensis', is widely consumed in many countries, especially in the Far East. The tea plant, which contains phenolic compounds, has developed unique drinking styles based on the cultures of different countries. In some countries, it is consumed with unusual substances such as milk and sugar, in some geographies it is consumed with fresh mint, ginger, orange peel, lemon, etc. With its history dating back to ancient times BC, it has an important place, especially in Chinese medicine and mythology. One of the most notable examples of this situation is known in the book Pen T-Sao, written about medicinal plants by the Red Emperor Shen Nung, who left his name legendary on the stage of history. Shen Nung states in his book that he discovered tea by chance when tea leaves fell into boiling water in 2737 BC (Üstün & Demirci, 2013). In addition to being used as an enjoyable beverage, tea, known as a medicinal plant, has a philosophical perspective, the development of its traditional qualities with belief as a world view, the harmony of the cups and glasses designed for its consumption with physiology - such as holding in the hand, compatibility with the hand, perceiving the surface and color of the liquid, sipping - the aesthetic value of the preparation objects and their integration with the atmosphere, and the connection with traditional values. With its blending, becoming a metaphor and ritualization, and gaining its unique quality, it has been a trigger for the emergence of different spaces in different cultures and the meaning of tea in these places. Turkish and Japanese cultures, two societies in which the tea plant has been traditionalized by turning it into a metaphor, also come to the fore globally. The objects and rooms designed by the Japanese society for the tea ceremony, as well as the unique tea cups and saucers devoted to tea by the Turkish society, and the teahouses integrated with the name of tea, are some of the most distinctive examples of cultures. For this reason, the paper focuses on the tea plant, which turns into objects from a philosophical point of view in Turkish and Japanese cultures, and becomes an indispensable part of life by becoming spatial from objects. The paper particularly examines the genesis of objects and spaces. In the study, in terms of Turkish culture, the process of tea from growing until it reaches the table, its characteristics, and especially its suitability for the Black Sea Region of Turkey, and issues such as 'ince belli bardak' and 'çayhane', which emerged with the cultural development of tea, known for its regional-specific qualities, specific to Anatolia, are touched upon. From the perspective of Japanese culture, the subject is the tea ceremonies, which have become traditional and have gained a place for themselves with their different and unusual qualities from all over the world, and the objects and spaces that have

developed accordingly. Considering the tea ceremonies, it can be said that philosophical beliefs such as Buddhism and Zen in Japanese culture also influenced and ritualized the tea culture. Thus, in the study, the development process of the tea plant, which is blended with beliefs by symbolizing peace and introversion from the Japanese perspective, will be explained in detail. The research discusses the tea plant with all features like medical, recreational, cultivated, traditionalized, commodified, metaphorized, objectified spatialized, etc., and it will evaluate with data analysis method and present a comparison based on cultures.

KEYWORDS: tea plant, tea culture, Japan, Türkiye, tea room, çayhane.

TÜRK VE JAPON ÇAY KÜLTÜRLERİ VE MEKANLARI

ÖZET

Dünyanın neredeyse her yerinde, coğrafi konum, iklim koşulları ve halkların kültürlerine göre farklılaşan çay bitkisi kahvaltıdan akşam öğünleri ve sonrasına kadar, sohbetin eşlikçisi olarak tüketilen önemli bir bitki ve içecektir. Latine adı ‘Camellia Sinensis’ olan bu bitkiyi başlıca uzak doğu olmak üzere pek çok ülke yaygın olarak tüketmektedir. Fenolik bileşikler içeren çay bitkisi, farklı ülkelerin kültürleri temelinde özgün içim türleri ile gelişmiştir. Bazı ülkelerde süt ve şekerle tüketilirken, bazı coğrafyalarda taze nane, zencefil, portakal kabuğu, limon vb. gibi alışılmışın dışında maddeler ile tüketilmektedir. Geçmiş m.ö. oldukça eski tarihlere kadar dayanmakla birlikte, özellikle Çin tıbbi ve mitolojisinde önemli bir yeri bulunmaktadır. Bu durumun en dikkate değer örneklerinden biri, tarih sahnesine adını efsanevi olarak kazıyan Kızıl İmparator Shen Nung’un şifalı bitkiler hakkında kaleme aldığı Pen T-Sao isimli kitap ile bilinmektedir. Shen Nung, kitabında çayı tesadüf olarak bulduğunu, m.ö 2737’de kaynayan suya çay yapraklarının düşmesi ile keşfettiğini belirtmektedir (Üstün & Demirci, 2013). Keyif veren bir içecek olarak kullanılmasının yanında, tıbbi bir bitki olarak bilinen çay, felsefi bir bakışla, bir dünya görüşü gibi inançla töresel niteliklerinin geliştirilmesi, tüketimi için tasarlanan fincan ve bardakların fizyoloji ile olan uyumu - elde tutma, el ile olan uyumu, sıvının yüzeyini, rengini algılama, yudumlama vb. gibi -, hazırlama nesnelerinin estetik değeri ve atmosferle entegrasyonu, geleneksel değerler ile harmanlanması, metafor haline gelmesi ve ritüelleşmesi, kendine özgü nitelik kazanması ile farklı kültürlerde, farklı mekanların ortaya çıkmasına ve çayın bu mekanlarla anlamlandırılmasında tetikleyici olmuştur. Çay bitkisinin özellikle bir metafor haline getirilerek gelenekselleştirildiği iki toplum olan, Türk ve Japon kültürleri global de de ön plan çıkmaktadır. Gerek Japon toplumunun çay seramonisi için tasarladığı nesneler ve odalar, gerekse Türk toplumunun çaya adanmış özgün çay bardakları, çay tabakları gibi nesneleri ve çay adıyla bütünleşen çayhaneleri, kültürlerin en belirgin örneklerinden bazılarıdır. Bu sebeple bildiri, Türk ve Japon kültürlerinde, felsefi bakış açısından nesnelere dönüşen, nesnelerden ise mekanlaşarak yaşamın vazgeçilmez bir parçası haline gelen çay bitkisini kendine konu edinmiştir. Bildiri, nesne ve mekanların oluşumlarını özellikle irdelenmektedir. Çalışmada başlıca Türk kültürü açısından, çayın yetiştirilmesinden sofralara gelene kadar olan süreci, özellikleri, ve özellikle Türkiye’nin Karadeniz Bölgesi’ne uygunluğunu ve bölgeye özgü nitelikleri ile bilinen çayın Anadolu’ya özgü kültür gelişimi ile ortaya çıkan incelli belli bardakları ve çayhane gibi konulara değinilirken, Japonya kültürü perspektifinde, tüm dünyadan farklı ve alışılmışın dışındaki nitelikleri ile gelenekselleşerek kendine yer edinen çay seramonileri ve buna bağlı olarak gelişen nesne ve mekanları konu edinilmektedir. Çay seramonileri dikkate alındığında, Japon kültüründeki Budizm, Zen gibi felsefi inanışlarında çay kültürünü etkilediği ve ritüelleştirdiği söylenebilir. Bu sebeple çalışmada,

Japonya perspektifinde huzur verici ve içe dönmeyi sembolize ederek inanışlarla harmanlanan çay bitkisinin gelişim süreci de detaylı olarak aktarılacaktır. Bildiri, tıbbi, keyif verici, yetiştirilen, gelenekselleşen, metalaşan, metaforlaşan, nesneleşen ve mekanlaşan vb. tüm özellikleri ile çay bitkisini ele alacak, veri analizi yöntemi temelinde değerlendirecek ve kültürler temelinde bir karşılaştırma sunacaktır.

ANAHTAR KELİMELEER: çay bitkisi, çay kültürü, Japonya, Türkiye, çay odası, çayhane

TOWARDS NET-ZERO: A COMPREHENSIVE DATA-DRIVEN FRAMEWORK OF CIRCULAR ECONOMY PRINCIPLES IN ARCHITECTURAL DESIGN

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ABSTRACT

This paper presents a holistic approach aimed at advancing sustainability within the built environment. In response to the urgent need for transformative practices, our research delves into the integration of circular economy principles in architectural design through a comprehensive and data-driven framework. The study embraces a multidisciplinary perspective, bridging the domains of architecture, data science, and sustainability.

The proposed framework is rooted in robust data analytics, employing advanced methodologies to inform decision-making processes throughout the architectural design lifecycle. By leveraging data-driven insights, the research seeks to optimize material usage, energy consumption, and waste management, thereby contributing to the overarching goal of achieving net-zero environmental impact. Circular economy principles, which prioritize resource efficiency, waste reduction, and life cycle considerations, form the core foundation of the framework.

The paper explores key components of the framework, emphasizing the synergies between data-driven methodologies and circular economy principles. Real-world applications and case studies illustrate the practical implementation of the proposed approach, showcasing its efficacy in enhancing sustainable practices within architectural design. The findings underscore the potential of this holistic framework to guide architects, educators, and industry stakeholders towards a future where net-zero aspirations are not only achievable but integral to the ethos of architectural innovation and environmental stewardship. This research contributes to the ongoing discourse on sustainable architecture by offering a clear and actionable strategy that integrates circular economy principles with data-driven decision-making. The aim is to facilitate the advancement of net-zero goals within the architectural field, providing an accessible framework for sustainable design practices.

KEYWORDS: Circular economy principles, Data-driven framework, Life cycle analysis, Net-zero design, Sustainable architecture

SUSTAINABLE WORKFORCE IN THE CONSTRUCTION INDUSTRY: A COMPREHENSIVE EXAMINATION OF ARCHITECTS' AND ENGINEERS' PERSPECTIVES

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ABSTRACT

The construction industry, a cornerstone of global infrastructure development, faces an unprecedented challenge in the 21st century—sustainability. As climate change concerns intensify and the world seeks more ecologically responsible practices, it becomes imperative to scrutinize the workforce within the construction sector. This research embarks on a multidimensional exploration, delving into the critical nexus of sustainability and the professionals shaping the architectural, engineering, and construction (AEC) landscape.

The significance of this study lies in its overarching aim to unravel the intricate tapestry of sustainable workforce practices in the construction industry. Beginning with an extensive literature review, we survey existing knowledge and illuminate the evolving discourse surrounding sustainability within the AEC sector. Drawing on theoretical frameworks from various disciplines, we construct a foundation for our empirical investigation.

Our primary research methodology involves a targeted survey administered to architects and engineers actively engaged in the AEC field. By capturing their insights, experiences, and perspectives, we aim to discern the prevailing attitudes towards sustainability, identify challenges faced in integrating green practices, and uncover innovative solutions employed by professionals on the frontline of construction projects. This survey serves as a key instrument in gauging the industry's readiness to embrace sustainable workforce practices and contributes valuable data to the existing body of knowledge.

Furthermore, the study adopts a forward-thinking approach, emphasizing the potential transformative role architects and engineers can play in steering the construction industry towards a more sustainable future. By addressing not only environmental considerations but also social and

economic dimensions, we seek to holistically evaluate the impact of a sustainable workforce on the AEC sector's long-term viability.

In presenting a summary paper at a congress, we aim to initiate a discourse among scholars, practitioners, and policymakers. The summary will synthesize key findings, offer actionable insights, and present a roadmap for fostering sustainable practices within the construction workforce. By disseminating our research at this stage, we aim to stimulate early engagement, encouraging stakeholders to contribute to the ongoing dialogue on reshaping the construction industry into a sustainable and resilient force for generations to come.

In conclusion, this study serves as a vital stepping stone towards a more sustainable future for the construction industry, fostering a workforce that not only envisions but actively contributes to building a world that balances human needs with ecological imperatives.

KEYWORDS: Sustainable workforce, Construction, Architects, Engineers.

TOWARDS NET-ZERO: A COMPREHENSIVE DATA-DRIVEN FRAMEWORK OF CIRCULAR ECONOMY PRINCIPLES IN ARCHITECTURAL DESIGN

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ABSTRACT

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The paper explores key components of the framework, emphasizing the synergies between data-driven methodologies and circular economy principles. Real-world applications and case studies illustrate the practical implementation of the proposed approach, showcasing its efficacy in enhancing sustainable practices within architectural design. The findings underscore the potential of this holistic framework to guide architects, educators, and industry stakeholders towards a future where net-zero aspirations are not only achievable but integral to the ethos of architectural innovation and environmental stewardship. This research contributes to the ongoing discourse on sustainable architecture by offering a clear and actionable strategy that integrates circular economy principles with data-driven decision-making. The aim is to facilitate the advancement of net-zero goals within the architectural field, providing an accessible framework for sustainable design practices.

KEYWORDS: Circular economy principles, Data-driven framework, Life cycle analysis, Net-zero design, Sustainable architecture.

**MASS GRADIENT STUDY OF POLYACRYLAMIDE/Fe₃O₄ MAGNETITE
NANOPARTICLE ADDED CONCRETE IN CASPIAN SEA WATER****Saadat HUMBATOVA**

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It is known that the regulation of the composition of concrete during exploitation depends on the environmental conditions and the place of application. In the presented work, concrete samples were prepared by adding magnetite nanoparticles synthesized in partially hydrolized polyacrylamide (HPAA) medium to *Portland* cement. Mass changes of obtained concrete in *Caspian Sea* water were evaluated and compared with control simple (Fig. 1).

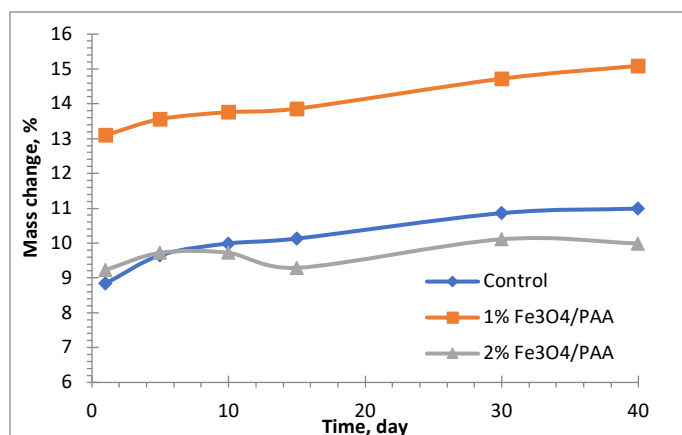


Fig. 1. Adsorption kinetics of HPA/Fe₃O₄ magnetite nanoparticle modified concrete in *Caspian Sea* water

It was determined that the control simple and 2% (w/w) HPA modified concrete underwent the same degree of adsorption process during 10 days. 1% (w/w) HPA/concrete was observed with 4-4.5% more mass increasing and up to 15% adsorptive mass change occurred in 40 days. As it can be seen, in 2% (w/w) HPA/concrete, the penetration of ions is limited and even undergoes a smaller mass change compared to the control concrete. It is clear that the mass growth was

stabilized after 40 days. The high adsorption in HPAA/concrete sample with 1% (w/w) Fe_3O_4 nanoparticles was due to magnetite particles. HPAA macromolecules only ensure that the size of magnetite nanoparticles remains stable for a long time. Thus, the distribution of magnetite nanoparticles at a concentration of 1% (by mass) on the surface allows forming pores that help water molecules to penetrate into the inner layers. As the density of magnetite nanoparticles increases, the penetration of salt ions and water molecules becomes difficult due to the hydrophobicity of the concrete surface. Since adsorption occurs only on the surface, iron oxides limit the penetration of hydrate ions into the concrete. Research in this direction is currently being continued with the control of the mass for one year. Based on the results, advanced materials resistant to seawater can be prepared from the HPAA/concrete sample with 2% (w/w) magnetite nanoparticles.

KEYWORDS: cement concrete, magnetite nanoparticles, polyacrylamide, adsorption, Caspian sea

Acknowledgment

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MODELING AND SIMULATION OF DC GLOW DISCHARGES IN THE ZINC SELENIDE-ARGON/HYDROGEN MICROPLASMA SYSTEM

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ABSTRACT

Infrared detection and image conversion devices with high sensitivity to thermal sources emitting in the mid-infrared range are of great importance in advanced optoelectronic applications.

This exploratory research study is dedicated for the investigation of gas discharge-semiconductor microplasma system (GD-S μ PS) using the finite-element method (FEM) solver COMSOL Multiphysics DC plasma simulation tool. The system is modeled in a two-dimensional square chamber consisting of a simple planar zinc selenide (ZnSe) cathode electrode coupled to a planar anode electrode across the argon/hydrogen (Ar/H₂) gas discharge cell at sub-atmospheric pressure. The electrical equivalent circuit of the system is driven by a constant power source to simulate transitions from the electron field emission state to the self-sustained normal glow discharge state and numerically analyze the spatiotemporal variations of the discharge parameters including electron current density.

It is concluded that by adding a small molar fraction of hydrogen to the argon gas medium, the micro glow discharge plasma parameters can be tuned to specific applications such as high-resolution mid-infrared (IR) sensing and thermal imaging.

KEYWORDS: Microplasma, zinc selenide, glow discharge, simulation, mid-infrared detection.

INVESTIGATION OF DIRECT CURRENT MICRO GLOW DISCHARGE PLASMA IN THE MODIFIED ZINC SELENIDE-ARGON SYSTEM

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ABSTRACT

Recent studies were reported on the theoretical and experimental investigation of simple planar direct current gas discharge-semiconductor systems (GDSS) for modeling microplasma devices for a wide range of applications, including infrared-to-visible image converters and mid-infrared detectors.

In this research study, the relationship between the modified electron-emission surface of cathode electrode and the glow discharge light emission characteristics of microplasma cell was investigated.

Sub-atmospheric pressure transient micro glow discharges are driven by a constant power source in a two-dimensional square chamber to numerically analyze the spatio-temporal variations of discharge parameters in the hybrid zinc selenide-argon (ZnSe-Ar) system using COMSOL Multiphysics.

It is concluded that micropatterning of cathode electron emission surface can be utilized as an effective design tool to manipulate the glow discharge plasma parameters such as electron energy density and capacitive power deposition.

KEYWORDS: Microplasma, zinc selenide, DC glow discharge, simulation, infrared sensing-imaging.

PARASITE ARCHITECTURAL APPROACH IN THE CONCEPT OF PALIMPSEST: THE EXAMPLE OF ESMA SULTAN MANSION IN ISTANBUL

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ABSTRACT

Today, we encounter intersections of ideas where architectural concepts are understood from various perspectives, challenging traditional thinking and inspiring creative solutions. At this point, where the concept of palimpsest and the idea of parasitic structure come together, it is seen that these two seemingly dissimilar architectural philosophies create a resonance that can push the limits of creativity and sustainability in the built environment. In the architectural context, the concept of palimpsest denotes an approach where different layers come together over time and interlock with each other through a process of transience. Palimpsest's image preserves elements of its previous narratives, facilitating the redesign of spaces for modern needs and emphasizing the evolution of space. This approach's allure and moral value lie in its respect for and assessment of historical narratives, adding a layer of complexity to the built environment. On the other hand, parasite architecture may initially evoke images associated with unwanted invaders, but it represents an innovative approach to reusing unused or abandoned areas without causing structural damage. These structures maintain a symbiotic relationship that benefits themselves and their surroundings, feeding off the host building. The combination of the palimpsest concept and parasite architecture creates an extraordinary dynamic. These structures remain legacies of the past while embracing the present, advocating for sustainability, and the efficient use of urban spaces. In this context, the article examines projects redesigned with a combination of palimpsest and parasite architecture that functioned 2000 years later. As a field study, the restoration and functionalization process of Esma Sultan Mansion in Istanbul, Turkey, is an example of palimpsest and parasite architecture. As a result of the article, by analyzing the nuanced dialogue of preserving historical memory, a new narrative has been created about how parasite structures and palimpsest concept solutions can create sustainable spatial designs.

KEYWORDS: Palimpsest Concept, Parasite Architecture, Sustainable Spatial Design, Refunctioning

PALİMPSEST KAVRAMINDA PARAZİT MİMARİ YAKLAŞIMI: İSTANBUL ESMA SULTAN YALISI ÖRNEĞİ

ÖZET

Günümüzde mimari konseptlerin çeşitli bir perspektiften keşfedilip anlaşıldığı geleneksel düşünceye meydan okuyan ve yaratıcı çözümler için ilham kaynağı olan fikirlerin kesişim noktalarıyla karşılaşmaktadır. Palimpsest kavramı ile parazit yapı fikrinin birleştiği bu noktada, görünüşte birbirine benzemeyen bu iki mimari felsefenin, inşa edilmiş çevrede yaratıcılığın ve sürdürülebilirliğin sınırlarını zorlayabileceği bir rezonans oluşturduğu görülmektedir. Mimari bağlamda palimpsest kavramı, bir yapı üzerinde zaman içindeki süreçte farklı katmanların bir araya gelmesi ve geçişkenlik yoluyla birbirine adeta kenetlenmesi ile oluşan bir mimari yaklaşımını ifade etmektedir. Palimpsest düşüncesi önceki anlatılarının unsurlarını koruyarak, modern ihtiyaçlar için mekanların yeniden tasarlanması ve mekânın evriminin vurgulanmasını sağlamaktadır. Bu yaklaşımın çekiciliği ve ahlaki değeri, tarihi anlatılara olan saygısında ve değerlendirmesinde bulunmakla birlikte yapıli ortama bir karmaşıklık ve derinlik katmanı da eklemiştir. Öte yandan, parazit mimari, başlangıçta istenmeyen işgalcilere ait imgeleri çağrıştırmalı, fakat aslında mekânın genişletilmesi ve yeniden kullanılması için yenilikçi bir yaklaşımı temsil etmektedir. Parazit yapılar, mevcut binaya entegre olan işlevselliğini artıran, kullanılmayan veya terk edilmiş alanlara yapısal zarar vermeden yeni bir yaşam kazandıran yenilikçi yapıları ifade etmektedir. Bu yapılar hem kendilerine hem de çevrelerine fayda sağlayan simbiyotik bir ilişki içinde ev sahibi yapıdan beslenmektedir. Palimpsest kavramı ve parazit mimari birleştirilmesiyle olağanüstü bir dinamik oluşmaktadır. Yapılar, geçmişin mirası olarak kalmış ve aynı zamanda bugünü kucaklayarak sürdürülebilirliği, yaratıcılığı ve kentsel alanın verimli kullanımını savunmaktadırlar. Bu yapılar, köklerine saygı gösterirken mimari ilerlemenin güçlü örnekleri olmuştur. Bu bağlamda makale kapsamında örnek olarak palimpsest ve parazit mimarisinin birleşimi ile tasarlanan 2000 yıl sonrasında yeniden işlevlendirilmiş projeler incelenmiştir. Alan çalışması olarak palimpsest ve parazit mimarinin bir örneği olarak Türkiye, İstanbul'da yer alan Esmâ Sultan Yalısı'nın restorasyon ve yeniden işlevlendirilme süreci ele alınmıştır. Makalenin sonucunda tarihsel belleğin korunmasının nüanslı diyalogu çözümlenmesi ile birlikte parazit yapıların ve palimpsest kavramı çözümlerinin sürdürülebilir mekânsal tasarımlar oluşturabileceği bağlamında yeni bir anlatı oluşturulmuştur.

ANAHTAR KELİMELEER: Palimpsest Kavramı, Parazit Mimari, Sürdürülebilir Mekânsal Tasarımı, Yeniden İşlevlendirme.

ANALYSIS OF SPATIAL QUALITIES OF GAZİANTEP NATIONAL GARDENS THROUGH PPS'S PLACE-DIAGRAM PRINCIPLES

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ABSTRACT

The rapid population growth and construction of buildings have led to a decline in human-nature relationships and neglect of place quality. In this context, the design of public spaces becomes essential in meeting people's needs and interacting with each other. Based on the difference between space and place in the literature, the importance of place creation and its impact on individuals was revealed during the research. Numerous literature studies have been conducted on place-making theories. One of these researches is the criteria offered by the PPS (Project for Public Spaces), which focuses on enhancing societal needs and quality of life. The PPS approach evaluates place criteria under four main items: Access and linkages, image and comfort, sociability, uses and activities. This concept aims to secure individuals' needs to communicate, develop, and express themselves based on the principles stated for the design of public spaces. Additionally, the PPS demonstrates the 10+ concept's impact on place quality, connecting cities and countries with public spaces and mixed land-use neighborhoods based on users' multiple reasons (more than 10) to be in this place. As a prominent part of the public spaces, National Gardens are critical to revitalizing the open green areas in urban public spaces within their identity and cultural accumulation in the historical process, with their environmental and ecological structure. In this context, a field study based on qualitative research methods was carried out in the National Gardens in Gaziantep based on the principles of the PPS place diagram. The study presents suggestions based on place quality evaluation findings, concluding that the 10+ concept is a valuable resource for architects and urban planners in designing successful places. On the other hand, the research reveals the potential for the spatial quality approach to be applied to small-scale and macro-urban design projects.

KEYWORDS: Gaziantep National Gardens, PPS place-making diagram, Spatial qualities, The power of 10+

GAZİANTEP MİLLET BAĞÇELERİNİN MEKANSAL NİTELİKLERİNİN PPS MEKAN DİYAGRAMI İLKELERİ ÜZERİNDEN ANALİZİ

ÖZET

Nüfusun artması ve ardından yapıların hızla inşa edilmesi insan-doğa ilişkisinin gittikçe azalmasına ve mekan kalitesinin göz ardı edilmesine yol açmaktadır. Bu bağlamda kamusal mekanların tasarımı insanların ihtiyaçlarını karşılamak, birbirleriyle iletişimde olup, etkileşim kurdukları açısından önem kazanmaktadır. Araştırma sürecinde mekan ve yer kavramların literatürdeki farkına dayanarak yer oluşturma'nın önemi ve birey üzerindeki etkisi ortaya konulmuştur. Mekan kalitesi üzerinde bir çok literatür araştırması yapılmıştır. Bu araştırmalardan biri toplumun ihtiyaçlarını karşılamak ve yaşam kalitesini yükseltmek adına PPS'in (Project for Public Spaces) mekan kalitesi doğrultusunda sunduğu kriterlerdir. PPS yaklaşımı yer kavramındaki kriterleri, erişebilirlik, imaj ve konfor, sosyalleşme ve kullanım ve aktiviteler olmak üzere dört ana madde altında değerlendirmektedir. Bu yaklaşım, kamusal alanların tasarlanması için belirtilen ilkelere dayanarak bireylerin iletişim kurma, gelişme ve kendilerini ifade etme ihtiyaçlarını güvence altına almayı amaçlamaktadır. Ayrıca PPS, mekan kalitesindeki 10+ (artı) konseptinin gücünü ortaya koymaktadır. Bu konseptin arkasındaki fikir, kullanıcıların o yerde olması için çeşitli nedenleri (10'dan fazla) olduğuna dayanmaktadır. 10+ konseptinin bölgesel ölçekteki gücü, şehirleri ve ülkeleri önemli kamusal alanlar ve karma arazi kullanımlı mahallelerle bağlantı noktası olarak birbirine bağlamak anlamını taşımaktadır. Kamusal mekanlar sınıfında yer alan millet Bahçeleri kültürel mirası ve kültürel peyzaj değerlerinin önemli bir parçası olup, unutulmuş bir kavram olarak, tarihsel süreç içindeki kimliği ve kültürel birikimi çerçevesinde, çevresel ve ekolojik yapısı ile birlikte kentsel kamusal mekandaki açık yeşil alanları yeniden canlandırma amacıyla önem taşımaktadır. Bu doğrultuda Gaziantep ilindeki millet bahçelerinde PPS mekan diyagramı başlıklarından yola çıkarak nitel araştırma yöntemine dayalı bir saha çalışması gerçekleştirilmiştir. Mekan kalitesi değerlendirmesi sonucunda elde edilen bulgulara göre öneriler sunulmuştur. Sonuç kısmında ise çalışmadaki 10+ kavramının gücü mimarlar ve şehir planlamacılara başarılı mekanların tasarlanmasında yardımcı bir kaynak oluşturmaktadır. Öte yandan araştırma mekan kalitesi yaklaşımının sadece küçük ölçekli projelerde değil kentsel tasarım projelerine de uygulanabilme potansiyelini ortaya koymaktadır.

ANAHTAR KELİMELER: Gaziantep Millet Bahçeleri, Mekansal nitelikler, PPS yer diyagramı, 10+ noktanın gücü.

SHAPE MEMORY POLYMER COMPOSITES AND BIOMEDICAL APPLICATIONS

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ABSTRACT

Shape memory polymers are materials that can change shape by temporarily gaining shape with stimulating effects such as temperature, light (UV/NIR), humidity, pH, magnetic field and electrical effect and can return to their permanent shape when the stimulating effect is removed. Shape memory polymers, which are mostly worked with thermal effects, are used as a stimulating effect. Shape memory polymers are more preferred than other shape memory materials (alloys and ceramics) due to their easy processing, light weight and low cost. It is also ahead of other shape memory materials in terms of new technological developments. In recent years, the production of composite materials has come to the forefront in order to improve the properties of materials and to provide functional properties. In order to improve the properties of shape memory polymer materials and gain new properties, nano clays (TiN, SiC, etc.), carbon-based (graphene oxide, carbon nano tubes, etc.), nano metal or metal oxide (ZnO, TiO₂, Fe₃O₄, etc.) can be added to the polymer matrix. The fact that nanofillers have a large surface area (high aspect ratio) and strong interaction with polymers makes them attractive in the materials world. These produced nanocomposites are used in many fields such as textile, electronics, biomedical, space and aviation technologies, robotics, construction, material and tissue engineering. The aim of this study is to present a detailed review of the use of nanoparticle reinforced shape memory polymers, especially in the biomedical field.

KEYWORDS: Shape memory polymer, nanoparticle added nanocomposite, biomedical.

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A NEW APPROACH OF FLICKER ADJUSTEMENT FOR LED TV

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ABSTRACT

Every TV viewer expects a picture performance that will meet their expectations from a newly purchased TV unit. This is very natural, because They want to get what they paid for the TV unit. There are many items that affect TV image performance. Some of those; The display performance of the panel and/or cell unit used in the TV, the color gamut created/covered by the backlight unit together with the panel/cell (the number of colors that can display on the screen), etc. One of the most important factors affecting the display performance of the panel/cell unit is the flicker adjustement. If the flicker adjustement is not performed properly, some of picture problems such as picture flickering, mura, image sticking, Xtalk, color changes, white balance and brightness problems, etc. can be seen on the TV . Many TV manufacturers around the world avoid applying the flicker adjustement. One of the biggest reasons for this is the lack of knowledge in preparing the adjustment program. In this study, it is explained how the Flicker adjustment program can be made with a new methodology. Flicker adjustment program consists of 3 software files: main software module, parameter software file and process parameter file. The parameter software module is the software file containing the flicker pattern and relevant I2C memory addresses that the main software module will use during adjustment, and must be prepared differently for each panel/cell of different brands and sizes. In order to make the flicker adjustement properly, a correctly prepared parameter software file is needed. An 8x8 sized image cell of the pattern image on which the flicker performance will be measured on the TV screen should be written pixel by pixel to the parameter software file. The I2C addresses where the Vcom register values will be written during the flicker adjustement and after completing the adjustment should be defined correctly in the same software file. The last SW file is the process parameter file which includes min/max. FMA limit values allowed, the max./min. values of Vcom(/Vcom range) that the main software will use during the flicker adjustement. In the new methodology, the flicker adjustment software should write primarily the min. Vcom value of the range to the panel/cell vcom register address and the flicker percentage (FMA value) observed on the screen should be measured with a flicker measurement equipment and saved in a seperate text file. Then, the max. value of Vcom range taken from the process parameter txt file should be written to the relevant Vcom register and the flicker FMA value measured from the screen should be saved again in the same txt file. Subsequently, the same process should be repeated for the middle value of the Vcom value range in the process parameter file and the measured FMA value should be compared to the FMA values of max. Vcom and min. Vcom. The FMA values of max. and min. Vcom values whichever is closest to the FMA value of the middle Vcom determine the new small Vcom range(max. Vcom/min.Vcom~middle Vcom). Then, the middle Vcom value of the small range is determined. The middle Vcom value is written to the relevant Vcom register address and The relevant FMA value is measured via flicker measurement equipment and saved again in the txt fle. The same process should continue until the lowest FMA value is found. When the lowest FMA value is

found, the corresponding Vcom value is permanently saved to the relevant panel EEPROM address and the process is completed.

KEYWORDS: Flicker adjustement, Vcom register, FMA value, I2C address, Image sticking.

DETERMINATION OF THE EFFECTS OF FOOD TYPE AND FEEDING REGIMEN ON THE POWER DENSITY OF MICROBIAL FUEL CELLS

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ABSTRACT

Microbial fuel cells are one of the alternative energy generators that can convert biochemical energy into electrical energy. The low power density of microbial fuel cells is the most important factor preventing their widespread use in daily life. For this reason, studies are carried out to ensure that the cells work more stable and produce more power. In this study, the power behavior of the microbial fuel cell was examined when 3 different food types, 3 different daily feeding amounts and 3 different daily feeding regimes were fed to the microbial fuel cell. As a result of the studies, it was understood that intermittent feeding performed well in microbial fuel cells and that the nutrient prepared using yeast performed effectively. According to the data received, the cell provided an average power density of 102.33 W/m³ in intermittent feeding three times a day. In the experimental study conducted for performance output according to food types, it is seen that the nutritional extract using yeast is 61.91 W/m³ on average. Results involving feeding amount showed that abundance of food did not always positively affect performance.

KEYWORDS: Microbial fuel cells, type of nutrient, amount of nutrient, power density.

BESİN TİPİ VE BESLEME REJİMİNİN MİKROBİYAL YAKIT HÜCRELERİNİN GÜÇ YOĞUNLUĞU ÜZERİNDEKİ ETKİLERİNİN BELİRLENMESİ

ÖZET

Mikrobiyal yakıt hücreleri biyokimyasal enerjiyi elektrik enerjisine çevirebilen alternatif enerji üreteçlerinden biridir. Mikrobiyal yakıt hücrelerinin sahip oldukları düşük güç yoğunlukları günlük yaşamda yaygın olarak kullanımlarını engelleyen en önemli faktördür. Bu nedenle yapılan çalışmalar, hücrelerin daha stabil çalışmasına yönelik ve daha fazla miktarda güç üretmesine yönelik olarak yapılmaktadır. Bu çalışmada, mikrobiyal yakıt hücresine 3 farklı besin türünde, günlük 3 farklı besleme miktarında ve günlük 3 farklı besleme rejiminde besin verilmesi

durumlarında hücrenin verdiği güç davranışları incelenmiştir. Çalışmalar sonucunda mikrobiyal yakıt hücrelerinde aralıklı beslemenin iyi performans gösterdiği ve maya kullanılarak hazırlanan besin maddesinin etkin bir performans gösterdiği anlaşılmıştır. Alınan verilere göre günde üç defa aralıklı beslemede hücre ortalama olarak 102.33 W/m^3 güç yoğunluğu sağlamıştır. Besin türlerine göre performans çıktısı için yapılan deneysel çalışmada maya kullanılan besin özütünün ortalama olarak 61.91 W/m^3 olduğu görülmektedir. Besleme miktarını içeren sonuçlar, besin miktarının çokluğu performansı her zaman pozitif yönden etkilemediğini göstermiştir.

ANAHTAR KELİMELEER: Mikrobiyal yakıt hücreleri, besin türü, besleme miktarı, güç yoğunluğu.

GİRİŞ

Günümüzde, hidroelektrik, güneş, rüzgâr, biyokütle, hidrojen ve diğer sürdürülebilir kaynaklardan temiz enerji üretimine yönelik talepte katlanarak bir artış yaşanmaktadır. Bu enerji kaynaklarına alternatif olarak mikrobiyal yakıt hücrelerinin kullanılması da potansiyel görülmektedir. Mikrobiyal yakıt hücreleri, mikroorganizmaların ürettiği enerjiyi elektrik enerjisine aktaran bir cihazdır. Mikrobiyal yakıt hücrelerinde en büyük problemlerden birkaçı yetersiz güç çıkışı ve maliyettir. Hücrenin temel yapı taşları elektron toplayıcı olarak iletken elektrot proton değişim membranı bakteri kültürü ve besin kaynağıdır. Literatürdeki çalışmalar incelendiğinde hücre performansına etki eden ana faktörlerin başlıca besin maddesinin oksidasyonu, elektroda elektron transferi, iç direnç, proton difüzyonu, katot reaksiyonu, oksijen difüzyonu ve besin akış hızıdır (Gil et al., 2003).

Hücrenin anot kısmında gerçekleşen yükseltgenme tepkimeleri akım çıkışına ciddi etkiler yapmaktadır. Bu tepkimelerin iyileştirilmesi gerekmektedir. Oksidasyon hızı bire bir güç verimliliğiyle ilgilidir. Yapılan çalışmalarda biyosensör teknolojilerinin de temeli olan besin oksidasyonu enerji çıkışı ile yapılan önceki çalışmalardan alınmış biyosensör verisi enerji çıkışı çalışmalarda görüldüğü gibi doğru orantılıdır (Adekunle et al., 2019; Chouler et al., 2018; Tront et al., 2008). Bu çıkış verilerinin karakteristik özelliklerine göre verilen besin maddesinin türünü tespiti yapılan çalışmalar ile ispatlanmıştır. Bu sebeple oksidasyon önemli bir faktördür ve iyileştirilmesi hücre performansı ve geleceği için kaçınılmazdır. Oksidasyon hızı kullanılan besine göre farklılık göstermektedir. Literatürde yapılan bazı çalışmalarda çeşitli besin özlerinin hücrelerin beslenmesi amacı ile kullanıldığını göstermiştir (Chen et al., 2018; He et al., 2021).

Yapılan bu çalışmada, 3 farklı besin türünün; pazar atıklarının bitkisel gliserin (BG), maya özü (MYÖ), şekerli su (ŞS) beslenmesi ile hücrenin güç yoğunluğu değerleri üzerindeki etkileri incelenmiştir. Ayrıca, günlük olarak besleme miktarı üzerinde değişiklik yapılarak ve günlük tek besleme, çift besleme, üç beslemeli olarak besleme yapılarak en uygun besleme tipinin belirlenmesi amaçlanmıştır.

YÖNTEM

Hücre besleme için izlenecek temel yol olan bitkisel gliserin tabanlı pazar atığı özü çalışması için Şekil 1A'da görülen pazar alanına ait atıkların Şekil 1B'deki gibi toplanması yapılmıştır.

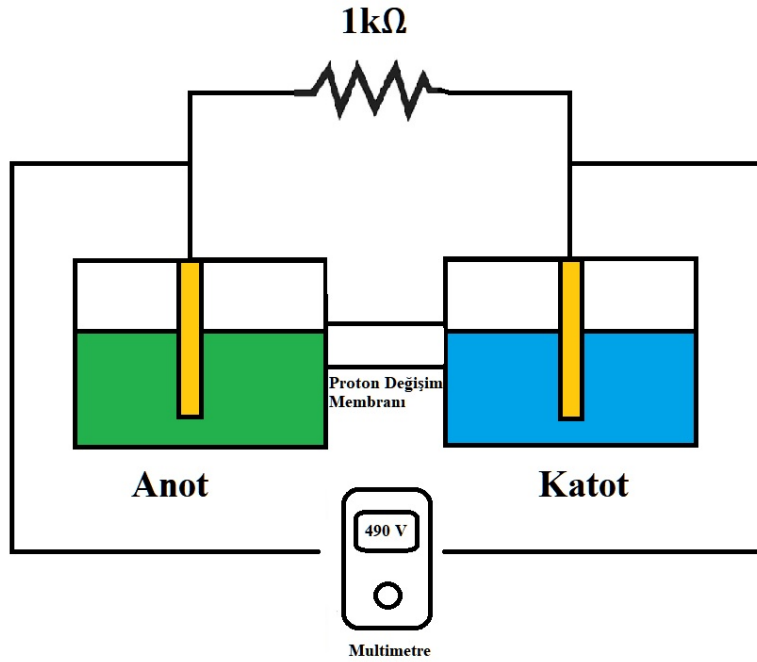


Şekil 1. Pazar atığı özü hazırlanması; A) pazar alanı pazar atığı B) atıkların toplanıp bir araya getirilmesi C) atıkların parçalanması D) özün hazırlanması.

Toplanan pazar atıkları için Şekil 1C'deki gibi blenderde parçaları ayrılıp için Şekil 1D'de görüldüğü üzere bitkisel gliserin ile karışımı yapılmıştır. Yapılan bu karışım bir haftalık süre ile bekletilip katı partiküllerinden ayrıştırılmıştır ve bir kap içerisinde hücre aşılması için depolanmıştır. İkinci tür besin olarak maya özü pazar atığı kullanılmıştır. Toplanmış ve parçalarına ayrılmış pazar atıklarının maya ile mayalanması ve hava kilidi ile bir haftalık süre ile bekletilmiş ve katı partiküllerinden ayrıştırılmıştır. Hücreye aşılacak üzere bir kap içinde depolanmıştır. Üçüncü besin olarak şekerli su tercih edilmiştir. Deneysel çalışmada ikinci grup çalışmada bu hücrelerin sabit bir besin ile farklı oranlarda beslenmesi planlanmıştır. Toplamda sekiz günlük deney süresi boyunca hücrelere 20 ml/gün, 30 ml/gün ve 40 ml/gün şeklinde besleme yapılması planlanmıştır. Bu besleme türlerinin güç yoğunluğu çıktıları kayıt altına alınmıştır. Çalışmanın üçüncü grubunda besleme tipi deneyi planlanmıştır. Hücrelere tek seferlik besleme yerine farklı besleme tipleri ile besleyerek güç yoğunluğu çıktısı gözlemlenmesi ve en verimli yöntemin tespit edilmesi hedeflenmiştir. Deneysel sistemlerin kurulumundan sonra üç adet hücreye ayrı ayrı besleme yapılmıştır. Birinci hücreye günde bir defa 30 ml besin, ikinci hücreye günde iki defa 15 ml besin, üçüncü hücreye günde üç defa 10ml besin verilmiştir.

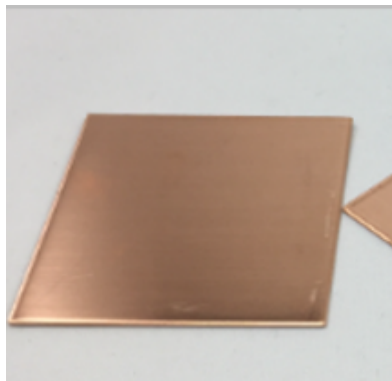
Çalışmada hücre tipi olarak Şekil 2'de görülen çift odacıklı Nafion HP tipi proton değişim membranı ile ayrılmış hücre kullanılmıştır. Hücreler pleksiglastan imal edilmiştir. Sızdırmazlık sağlanması için silikon conta kullanılmıştır. Çamur yerleşimi sağlandıktan sonra anot odası

anaerobik hale getirilmiştir. Katot odası su ile doldurulup hücre dış devrede 1 kΩ direnç ile bağlanıp hücrenin polarizasyonu yapılmıştır.



Şekil 2. Çift odacıklı deneysel mikrobiyal yakıt hücresi.

Çalışmada parametrelerin değişimini net bir şekilde gözlemlenebilmesi için tüm hücrelerde hem anot hem de katot odalarında Şekil 3’de görüleceği üzere sabit tip plaka geometri levha yapılı 2 mm kalınlığında 40x40mm bakır elektrot kullanılmıştır. Hücrenin ölçümleri multimetre ile yapılmıştır. Hücreden okunan voltaj değeri aşağıdaki denklem ile güç yoğunluğuna dönüştürülmüştür.



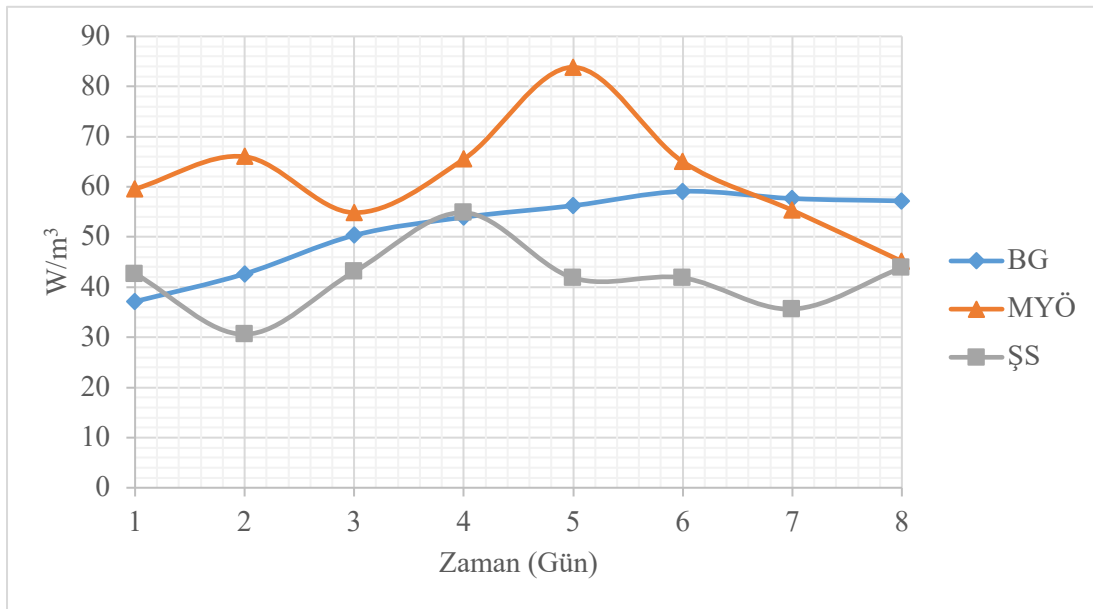
Şekil 3. Plaka geometri levha yapılı bakır elektrot.

$$\text{Güç Yoğunluğu} = \frac{G}{H} = \frac{V^2}{RH}$$

Burada G güç, H hacim, V voltaj ve R direnci temsil etmektedir. Alınan voltaj verileri bu formüle göre düzenlenmiştir.

BULGULAR

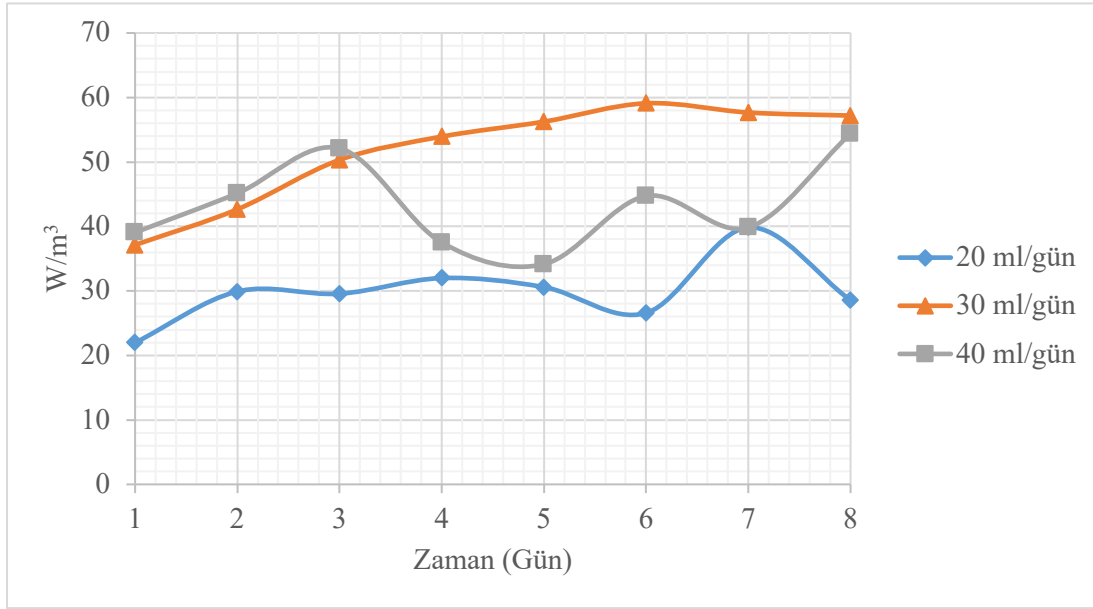
Çalışma sonucunun çıktılarına göre Şekil 4'te besin türünün güç yoğunluğu çıkışına olan etkisi görülmektedir. Elde edilen verilere göre uygulanan besinlerden en yüksek maya özlü pazar atığı besini olduğu görülmektedir. Maya özlü pazar atığı besininde maksimum güç noktası olarak 83.84 W/m^3 olduğu görülmektedir. Bitkisel gliserin tabanlı pazar atığı özü ve şekerli suda maksimum güç yoğunluğu sırasıyla 59.10 W/m^3 ve 54.85 W/m^3 'dür.



Şekil 4. Mikrobiyal yakıt hücrelerinde besin türünün zamana göre güç yoğunluğu değişimi.

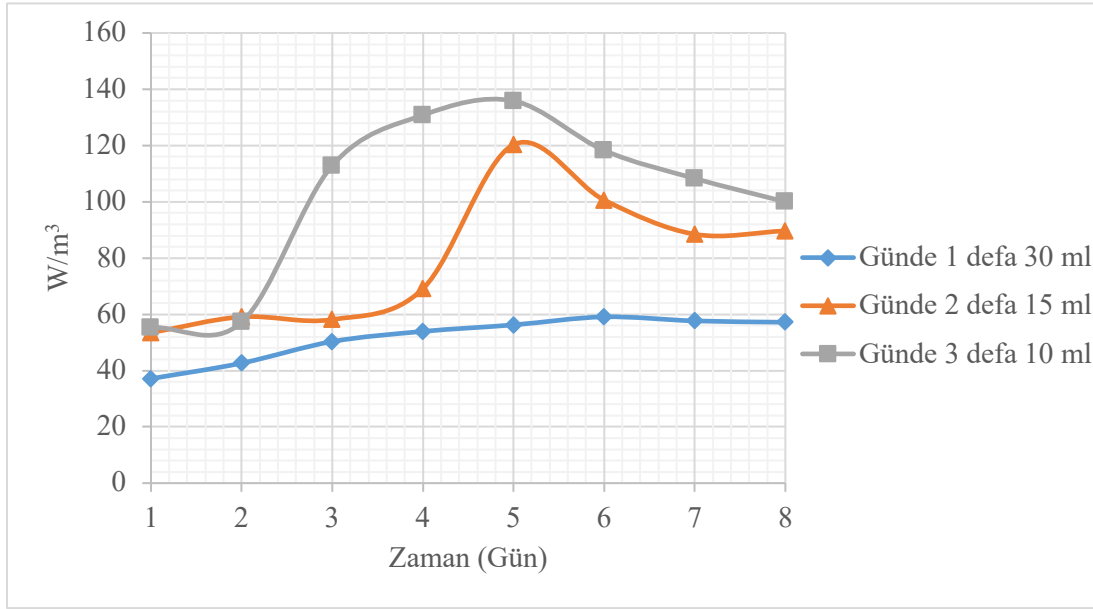
Hücreler içinde bitkisel gliserin tabanlı pazar atığı özü stabil bir yükselme kaydetmiştir. Şekerli su genellikle dalgalı ama ortalamada stabil bir yükseliş kaydetmiştir. Maya özü pazar atığı dalgalı fakat maksimum noktaya ulaştıktan sonra ciddi bir düşüş kaydetmiştir.

Şekil 5'da besleme miktarının hücreye olan güç yoğunluğu çıkışı etkileri görülmektedir. Veriler incelendiğinde güç çıkışı olarak en yüksek değere 30 ml/gün besleme parametresi bulunan hücre ulaşmıştır. Bu hücre maksimum güç noktası olarak 59.10 W/m^3 çıktısını vermiştir. Bu hücre dışında 20 ml/gün ve 40 ml/gün besleme oranlarının güç çıkışları sırasıyla 39.85 W/m^3 ve 54.39 W/m^3 'dür. Veriler incelendiğinde 20 ml/gün ve 30 ml/gün parametresi genellikle stabil yükselişler kaydetmiştir. Fakat 40 ml/gün parametresi 2 gün yükseliş kaydettikten sonra düşüş kaydetmiştir ve çoğunlukla düşüşünü korumuştur.



Şekil 5. Mikrobiyal yakıt hücrelerinde besleme miktarının zamana göre güç yoğunluğu değişimi.

Son deney grubu olan besleme tipine ait grafik Şekil 6'de görülmektedir. Grafik incelendiğinde gözle görülür bir şekilde en yüksek güç yoğunluğuna sahip olan konfigürasyonun günde 3 defa 10 ml beslemeli olan hücre olduğu görülmektedir. Bu hücre çalışma süresince maksimum olarak 135.87 W/m^3 güç yoğunluğunu elde etmiştir. Diğer konfigürasyonlardan günde 1 defa 30 ml ve günde 2 defa 15 ml besleme tiplerindeki maksimum güç çıkışları sırasıyla 59.10 W/m^3 ve 120.31 W/m^3 'dür. Grafik incelendiğinde günde 2 defa beslemeli ve 3 defa beslemeli konfigürasyonlar stabil bir başlangıç yaptıktan sonra yükselişe geçtiği ve bir miktar zaman sonra yavaşça güç yoğunluğu kaybedip stabil olmaya doğru gittiği görülmektedir.



Şekil 6. Mikrobiyal yakıt hücrelerinde besleme tipinin zamana göre güç yoğunluğu değişimi

Deneyisel çalışmalar tamamlanması ile aşağıdaki Tablo 1’deki verile ulaşılmıştır. Çalışmalardan alınan verilere göre BG, MYÖ ve ŞS çalışmalarından alınan sekiz günlük ortalama güç yoğunluğu sırasıyla 51.78 W/m³, 61.91 W/m³ ve 41.80 W/m³’dür. Günlük besleme oranı 20 ml, 30 ml ve 40 ml olan çalışmalardan alınan sekiz günlük ortalama güç yoğunlukları sırasıyla 29.88 W/m³, 51.78 W/m³ ve 43.37 W/m³’dür. Besleme tipi çalışmasında günde 1 defa 30 ml, günde 2 defa 15 ml ve günde 3 defa 10 ml deneylerinden alınan sekiz günlük ortalama güç yoğunlukları sırasıyla 51.78 W/m³, 79.86 W/m³ ve 102.33 W/m³’tür. Bu veriler ışığında en yüksek ortalama güç yoğunluğuna sahip ilk üç çalışma günde 3 defa 10 ml besleme, günde 2 defa 15 ml besleme ve MYÖ çalışmasıdır.

Tablo 1: Deneyisel çalışmada hücrelerin maksimum ve ortalama güç yoğunlukları

	BG	MYÖ	ŞS	20 ml/gün	30 ml/gün	40 ml/gün	Günde 1 defa 30 ml	Günde 2 defa 15 ml	Günde 3 defa 10 ml
Maksimum (W/m ³)	59.10	83.84	54.85	39.85	59.10	54.39	59.10	120.31	135.87
Ortalama (W/m ³)	51.78	61.91	41.80	29.88	51.78	43.37	51.78	79.86	102.33

TARTIŞMA VE SONUÇ

Çalışma kapsamında mikrobiyal yakıt hücrelerinin verimlilik ve pozitif yönlerini güçlendirmek amacı ile besin tarafında deneyisel çalışmalar yapılmıştır. Bu çalışmalarda üç farklı besin çeşidi kendi arasından deneyisel olarak karşılaştırılmıştır ve değerlendirilmiştir. Çalışmanın besin sistemini tam anlamıyla kapsaması amacıyla ikinci aşamada besin miktarının etkilerinin analizi

için üç farklı besleme miktarı kendi içinde deneysel olarak test edilmiştir. Sonraki aşamada ise besleme tipinin hücreye olan etkisinin anlaşılabilmesi için üç farklı besleme tipi deneysel olarak çalışılmış ve karşılaştırılmıştır. Yapılan bu çalışmanın sonucunda şu sonuçlara ulaşılmıştır;

- Yapılan çalışma sonucunda günde üç defa 10 ml besleme hem maksimum güç noktası olarak hem de ortalama en iyi performans gösteren konfigürasyon olarak önce çıkmaktadır.
- En iyi performansta ikinci deneyinde günde iki defa 15 ml olması nedeniyle aralıklı besleme daha iyi performans gösterdiği söylenebilir.
- Deneysel verilere göre en yüksek besleme en iyi performansı veremeyeceği sonucu çıkarılabilir.
- Besleme oranları içinde hücreye en iyi performansı verebilecek olan optimal besleme miktarı hücre performansını artırmada iyi bir etken olabilir.
- Hücrede besin türlerine göre en iyi performans maya özlü pazar atığı ile elde edilmiştir. Bu durum maya bakterilerinin oksidasyona yardımcı olmasıyla alakalı olabileceği düşünülmektedir. Bu durum dışında bitkisel gliserin tabanlı pazar atığı özü şekerli su konfigürasyonundan daha iyi performans gösterdiğini açıkça söyleyebiliriz

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INVESTIGATION OF THE EFFECTS OF DIFFERENT ELECTRODE STRUCTURES ON ELECTRICAL PERFORMANCE IN MICROBIAL FUEL CELLS

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ABSTRACT

Factors such as energy crisis and global warming have led people to research alternative energy sources. Microbial fuel cells, one of these alternative energy sources, are popular with their ability to convert biochemical energy into electrical energy and have many uses. In this study, both the structural and geometric effects of the electrodes used in the cell were examined in order to increase the electrical efficiency of the microbial fuel cell. The experimental study was carried out with three double-chamber microbial fuel cells during an eight-day experimental investigation. As a result of the study, it was seen that increasing the electrode surface area in the cells caused a remarkable increase in the power density of the cell. Among all variations, the highest power density value was achieved in the networked electrode structure with cylindrical geometry. On the other hand, when the 8-day average values were examined, the maximum power density value was obtained as 69.10 W/m³ in the pyramidal electrode with a network structure. As a result of the study, it was observed that cells with networked electrodes generally provide higher power density.

KEYWORDS: Microbial fuel cell, Electrode geometry in microbial fuel cell, Electrode structure in microbial fuel cell.

MİKROBİYAL YAKIT HÜCRELERİNDE FARKLI ELEKTROT YAPILARININ ELEKTRİKSEL PERFORMANS ÜZERİNDEKİ ETKİLERİNİN ARAŞTIRILMASI

ÖZET

Enerji krizi ve küresel ısınma gibi faktörler insanları alternatif enerji kaynaklarını araştırmaya yönlendirmiştir. Bu alternatif enerji kaynaklarından biri olan mikrobiyal yakıt hücreleri biyokimyasal enerjiyi elektrik enerji çevirebilmesi ve birçok kullanım alanı ile popüler bir konumda bulunmaktadır. Bu çalışmada mikrobiyal yakıt hücresinin elektriksel verimliliğini artırmak amacı ile hücrede kullanılan elektrotların hem yapısal hem de geometrik etkisi incelenmiştir. Deneysel çalışma üç adet çift odacıklı mikrobiyal yakıt hücresi ile sekiz günlük deneysel inceleme ile gerçekleştirilmiştir. Çalışma sonucunda hücrelerde elektrot yüzey alanının

artmasının hücrenin güç yoğunluğu üzerinde dikkate değer bir artışa neden olduğu görülmüştür. Bütün varyasyonlar arasında en yüksek güç yoğunluğu değerine silindir geometriye sahip ağ yapılı elektrot yapısında ulaşılmıştır. Diğer taraftan 8 günlük ortalama değerler incelendiğinde maksimum güç yoğunluğu değeri, ağ yapısına sahip piramit yapılı elektrotta 69.10 W/m^3 olarak elde edilmiştir. Çalışma neticesinde, genel olarak ağ yapılı elektrotlara sahip hücrelerin daha yüksek güç yoğunluğu sağladığı görülmüştür.

ANAHTAR KELİMELELER: Mikrobiyal yakıt hücresi, Mikrobiyal yakıt hücresinde elektrot geometrisi, Mikrobiyal yakıt hücresinde elektrot yapısı.

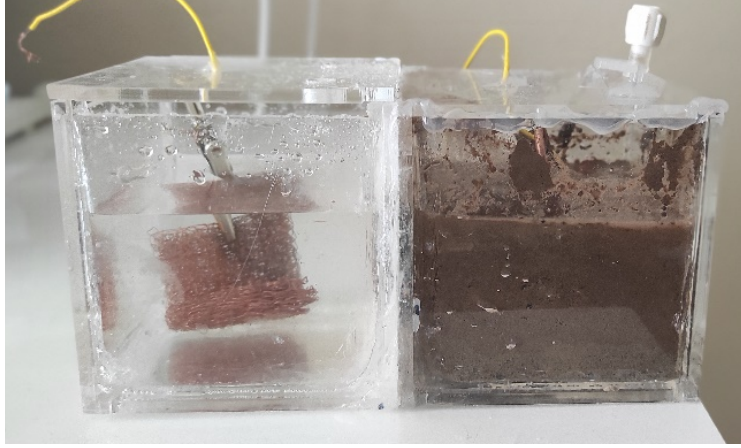
GİRİŞ

Son yıllarda petrol türevi enerji kaynaklarının çevreye verdiği zarar net bir şekilde gözlemlenmektedir. Bu nedenle küresel ısınma tehlikesi ve insanların ölümcül hastalığa yakalanmaları ile sonuçlanmaktadır. Bu durum karşısında insanlar çevreye daha az zararlı olan güneş enerjisi, rüzgâr enerjisi ve hidroelektrik santralleri gibi kaynaklar ile enerji ihtiyaçlarının en azından bir kısmını karşılamaya yönelmiştir. Bunun yanı sıra araştırmacılar kimyasal enerjiyi elektrik enerjisine çeviren yakıt hücreleri üzerinde ciddi oranda çalışma yapmıştır (Kouam Ida & Mandal, 2022). Mikrobiyal yakıt hücreleri son yıllarda giderek dikkat çeken alternatif ve çevreci enerji üretim yöntemlerinden biri olarak görülmektedir. Mikrobiyal yakıt hücrelerinin en büyük avantajları bakteri kültürünün kolay temin edilmesi ve günlük yaşamda kullanılan organik atıklar ile beslenebilmesidir. Diğer taraftan, mikrobiyal yakıt hücrelerinin düşük güç çıkışına sahip olması, bu hücrelerin efektif olarak kullanımını günümüzde sınırlayan en büyük dezavantaj olduğu görülmektedir. Mikrobiyal yakıt hücreleri bakterilerin organik besinler ile beslenmesiyle oluşan oksidasyonlar elektrik üretmektedir (Li et al., 2018). Mikrobiyal yakıt hücrelerinin kullanım alanları incelendiğinde; atıkları değerlendirme, enerji üretimi, atıksu arıtma veya hidrojen üretimi gibi alanlarda kullanılabildiği görülmektedir (Gajda et al., 2018). Temel olarak anaerobik anot ve aerobik katot bölmesinden oluşmaktadır. Anot ve katot bölmesi bir membran vb. ayırıcı ile ayrılmıştır. Anot ve katot tarafına birer elektrot yerleştirilerek anottan katoda elektron geçişi sağlanıp gerilim üretilmesi sağlanmıştır. Anot tarafına koyulan bakteri kültürüne belli periyotlarda organik maddeler aşılanarak bakterilerin beslenmesi sağlanmış olur. Beslenen bakteriler biyokatalizör görevi görerek yaşam döngüsünü devam ettirirken elektrodu oksitleyip elektron ve proton oluşumu sağlar. Ayırıcı proton değişim membranı sadece proton geçişi olmaktadır. Bu sayede anot tarafında oluşan biyolojik tepkime sonucu anottan katoda geçiş yaparak katot tarafında su oluşumu sağlanıp enerji üretim döngüsü oluşmuş olur (Şebnem ERENLER et al., 2018).

Mikrobiyal yakıt hücreleri hakkında literatür incelendiğinde genellikle elektrotun yapısal özellikleri üzerinde çalışmalar yapılmıştır. Elektrodun farklı geometrileri üzerine az sayıda ve yetersiz çalışmaların olduğu tespit edilmiştir. Elektrot yapısı hücrede en önemli parametrelerden biri olduğundan, üzerinde yapılacak yapısal iyileştirmeler hücrenin elektriksel performansını artıracığı düşünülmektedir. Bu çalışmada mikrobiyal yakıt hücrelerinde elektrot geometrisinin ve bu geometrilerin yapısal olarak farklılıklara göre enerji çıkışı ve verimlilik üzerindeki etkileri incelenmiştir.

YÖNTEM

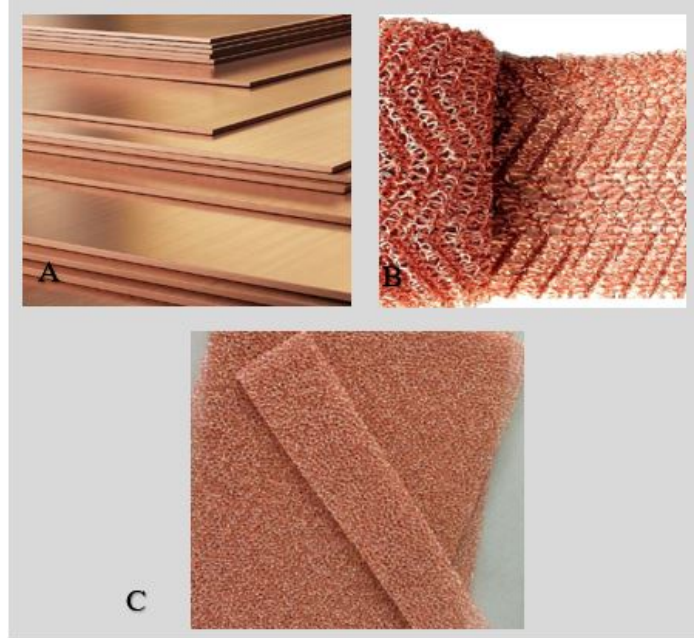
Yapılan bu çalışmada hücre yapısı olarak çift odacıklı mikrobiyal yakıt hücresi kullanılmıştır. Bu hücrenin temel yapısı iki odadan oluşmaktadır. Bu anot ve katot odaları yüksek proton geçirgenliğine sahip Nafion HP tipi membran ile ikiye ayrılmıştır.



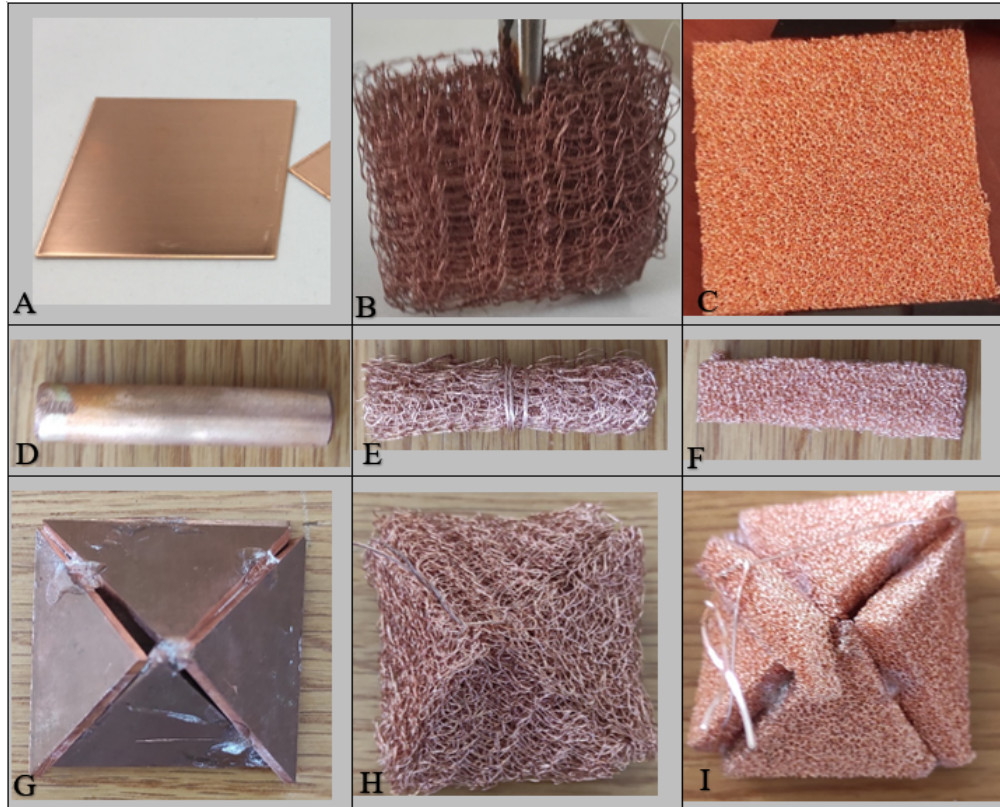
Şekil 7. Çift odacıklı deneysel mikrobiyal yakıt hücresi.

Hücrede anot ve katot odası dış devre aracılığı ile $1\text{ k}\Omega$ direnç ile bağlanmıştır. Hücrenin anot odasındaki bakterilerin beslenmesi günlük 30 ml pazar atıkları solüsyonu ile gerçekleştirilmiştir.

Deneysel çalışmalarda elektrot olarak bakır tabanlı materyal tercih edilmiştir. Bakırın yüksek iletkenlik katsayısı iç direncinin düşük olması bakırın daha fazla elektron toplama, kayıpları minimize etmesi ve maliyeti bakımından bakırın çalışmada ön plana çıkmasını sağlamıştır (*Elektriksel İletken- Vikipedi*, n.d.). Deneylerin yapılmasında üç çeşit yapıda bakır tercih edilmiştir. Bunlar Şekil 8’de görüldüğü üzere levha yapılı bakır, ağ yapılı bakır ve köpük yapılı bakırdır. Şekil 9’te çalışmada kullanılacak olan tüm elektrotların görselleri isimleri ile verilmektedir.



Şekil 8. A) levha yapılı, B) ağ yapılı, C) köpük yapılı bakır materyalleri.



Şekil 9. Deneysel elektrotlar, A) plaka geometrili levha yapılı, B) plaka geometrili ağ yapılı, C) plaka geometrili köpük yapılı, D) silindir geometrili levha yapılı, E) silindir geometrili ağ yapılı, F) silindir geometrili köpük yapılı, G) piramit geometrili levha yapılı, H) piramit geometrili ağ yapılı, I) piramit geometrili köpük yapılı elektrot.

Deneysel çalışma, hücrenin kurulum gününden itibaren 8 günlük ölçüm süresince gerçekleştirilmiştir. Her gün yapılan ölçümler sonucundan alınan veriler kayıt altına alınıp değerlendirilmiştir.

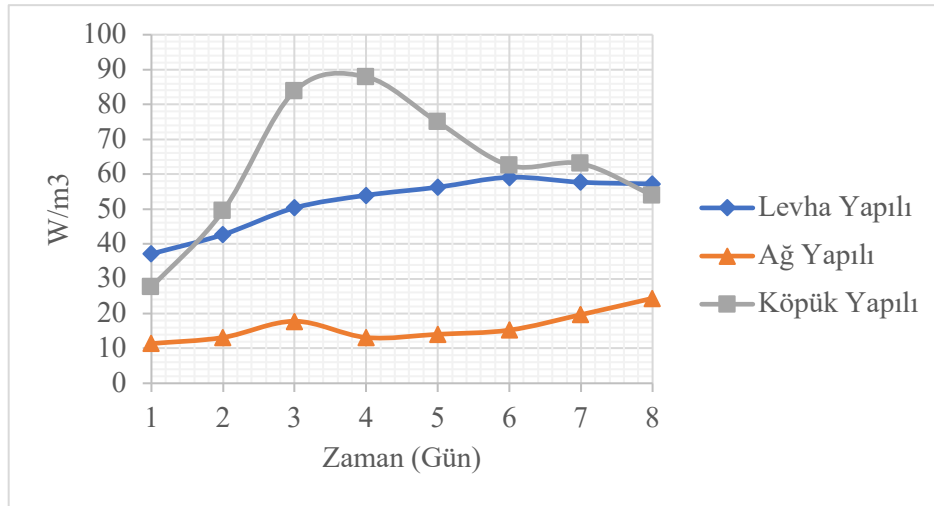
Güç yoğunluğu literatürde genellikle elektrot yüzey alanına üzerinden hesaplanıp metrekare başına düşen güç (W/m^2) veya toplam hücre hacmine göre metreküp başına düşen güç (W/m^3) olarak hesaplanmaktadır. Bu çalışmada standartlaştırılmış metreküp başına düşen güç hesabı yapılarak sınıflandırılmıştır (Logan, 2012; Logan et al., 2006).

$$\text{Güç Yoğunluğu} = \frac{G}{H} = \frac{V^2}{RH}$$

Burada G güç, H hacim, V voltaj ve R direnci temsil etmektedir. Alınan voltaj verileri bu formüle göre düzenlenmiştir.

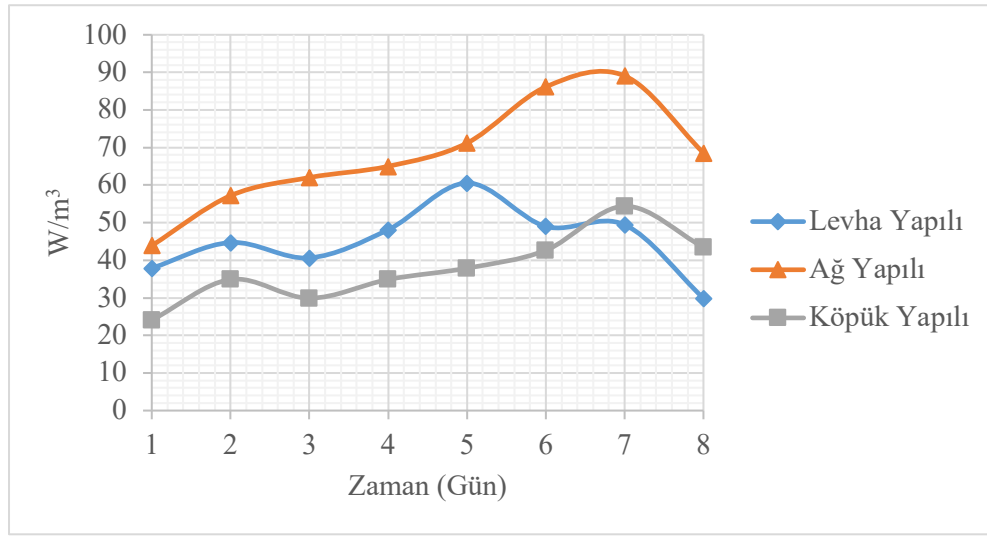
BULGULAR

Şekil 10'teki verilere göre plaka tipi geometriye sahip elektrotlar için en yüksek güç yoğunluğu oluşturan elektrot tipi $87,89 \text{ W/m}^3$ ile köpük yapılı elektrot olduğu görülmektedir. Levha yapılı elektrot, ağ yapılı elektrot ve köpük yapılı elektrot bulunan hücrelerde maksimum güç yoğunluğu değerleri sırasıyla 59.10 W/m^3 , 24.38 W/m^3 ve 87.89 W/m^3 'dür. Hücreler içinde levha yapılı ve ağ yapılı elektrotun bulunduğu hücreler güç yoğunlukları başlangıç gününden itibaren yükselim göstermiştir ve bir süre sonra düşüş kaydedilmiştir. Köpük yapılı elektroda sahip hücre hızlı bir yükseliş ile en yüksek güç yoğunluğuna ulaşmış ve yine radikal bir düşüşle stabil bir seviyeye ulaşmıştır.



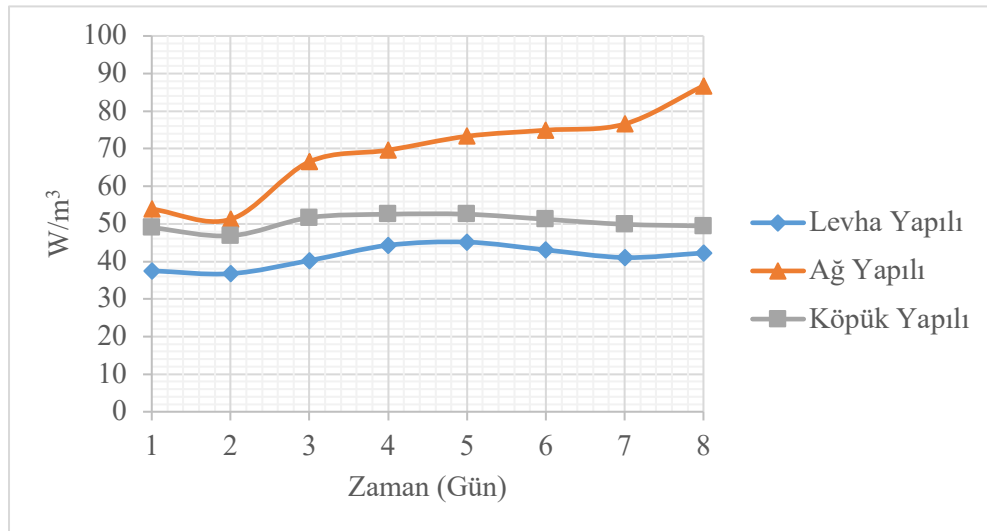
Şekil 10. Plaka geometrili elektrotların zamana göre güç yoğunluğu değişimi.

Şekil 11'de silindir geometrili elektrot tiplerinden yapısal olarak en yüksek güç yoğunluğu 89.07 W/m^3 ile ağ yapılı elektrotta görülmüştür. Sırasıyla levha yapılı, ağ yapılı ve köpük yapılı elektrotların maksimum güç yoğunluğu çıktısı 60.55 W/m^3 , 89.07 W/m^3 ve 54.39 W/m^3 'tür. Güç çıkışları genellikle ani yükseliş göstermeyip bir süre normal örüntüde ilerleme sağlayıp sonrasında deneysel çalışmanın sonlarına doğru düşüş göstermiştir.



Şekil 11. Silindir geometrili elektrotların zamana göre güç yoğunluğu değişimi.

Şekil 12’te piramit geometriye sahip deneysel çalışmaların güç yoğunluğu çıktıları görülmektedir. Yapılan bu konfigürasyonlarda alınan verilere göre hücreler genellikle çok az yükseliş kaydetmiş olup genellikle stabil bir ilerleme kaydetmiştir. İçlerinden sadece ağ yapılı elektrot deneylerin sonuna kadar yükseliş trendini bozmamıştır. Deneysel çalışma içinde en yüksek güç yoğunluğuna 86.72 W/m^3 ile ağ yapılı bakır elektrot ulaşmıştır. Hücrelerden alınan maksimum güç değeri levha yapılı, ağ yapılı ve köpük yapılı elektrotlarda sırasıyla 45.14 W/m^3 , 86.72 W/m^3 ve 52.56 W/m^3 ’dür.



Şekil 12. Plaka geometrili elektrotların zamana göre güç yoğunluğu değişimi.

Plaka geometrili deneylerde, levha yapılı, ağ yapılı ve köpük yapılı elektrotların sekiz günlük ortalama güç yoğunlukları Tablo 2’de görüldüğü üzere 51.78 W/m^3 , 16.11 W/m^3 ve 62.89

W/m^3 'dür. Silindir geometrili deneylerde levha yapılı, ağ yapılı ve köpük yapılı elektrot deneylerinden sekiz günlük ortalama güç yoğunlukları $45.04 W/m^3$, $67.89 W/m^3$ ve $37.77 W/m^3$ 'dür. Piramit geometrili deneylerde levha yapılı, ağ yapılı ve köpük yapılı elektrot deneylerinden sekiz günlük ortalama güç yoğunlukları $41.29 W/m^3$, $69.10 W/m^3$ ve $50.39 W/m^3$ 'dür.

Tablo 2: Deneysel çalışmada hücrelerin maksimum ve ortalama güç yoğunlukları

	Plaka levha Yapılı	Plaka ağ Yapılı	Plaka köpük Yapılı	Silindir levha yapılı	Silindir ağ yapılı	Silindir köpük yapılı	Piramit levha yapılı	Piramit ağ yapılı	Piramit köpük yapılı
Maksimum (W/m^3)	59.10	24.38	87.89	60.55	89.07	54.39	45.14	86.72	52.56
Ortalama (W/m^3)	51.78	16.11	62.89	45.04	67.89	37.77	41.29	69.10	50.39

En yüksek ortalama güç yoğunluğuna sahip deneysel çalışmalar sırasıyla piramit geometrili ağ yapılı bakır elektrot, silindir geometrili ağ yapılı bakır elektrot ve plaka geometri köpük yapılı bakır elektrottur.

TARTIŞMA VE SONUÇ

Bu çalışmada bakır temelli elektrot kullanılarak farklı yapılar ve geometrilerde mikrobiyal yakıt hücresinde deneysel çalışma yaparak güç yoğunluğu analizi yapılmıştır. İncelemeler geometrik şekillere göre kategorize edilmiştir. Levha yapılı, ağ yapılı ve köpük yapılı bakır materyalleri kullanılarak plaka geometrili, silindir geometrili ve piramit geometrili olmaz üzere dokuz adet elektrot hazırlanmıştır. Dokuz adet deney düzeneği ile sekiz gün boyunca güç çıkışı incelenmiştir. Deneysel çalışmadan elde edilen veriler ışığında şu sonuçlara ulaşılabilmektedir;

- Piramit geometrili elektrotlar daha fazla yüzey alanı ile daha fazla güç yoğunluğu elde edilmesini sağlayabilmektedir.
- Ağ yapılı elektrotlar yüzey alanı fazlalığı ile ve bakterilerin daha iyi nüfuziyet sağlaması için yeterli gözenekliliğe sahip olduğu için güç yoğunluğunu artırabilmektedir.
- Köpük yapılı elektrotlar yüzey alanı yüksek olmasına karşın dar gözeneklerden dolayı nüfuziyeti zayıflatmış ve verimliliği düşürdüğü düşünülmektedir.
- Ağ yapılı piramit elektrotlar diğer parametrelerde göz önünde bulundurulduğunda gelecek vaat eden ve üzerinde çalışılması gereken bir elektrot tipi olabileceği düşünülmektedir.

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OPTIMAL PATH SYNTHESIS OF PLANAR FOUR-BAR LINKAGES USING THE BEES ALGORITHM

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ABSTRACT

In this study, optimal path synthesis of planar four-bar linkages is carried out using the Bees Algorithm, one of the meta-heuristic optimization algorithms. The objective function to be minimized is taken as the sum of the squares of the distances between the points forming the coupler curves to be followed during the linkage's cycle and a coupler point on the linkage. The optimal design of the planar four-bar linkage is made in such a way that it meets Grashof's rule and the desired coupler curve is followed with minimum error. In this study, it was thought that without timing the planar four-bar linkage would follow the desired path. Using the Bees Algorithm, the planar four-bar linkage link dimensions is calculated in accordance with the desired constraints. The effectiveness and sensitivity of the algorithm used are demonstrated on an example application. Numerical application results are given graphically.

KEYWORDS: Planar four-bar linkage, path synthesis, optimization, the Bees Algorithm.

DÜZLEMSEL DÖRT ÇUBUK MEKANİZMALARININ ARI ALGORİTMASI KULLANARAK OPTİMUM YÖRÜNGE SENTEZİ

ÖZET

Bu çalışmada, meta-sezgisel optimizasyon algoritmalarından birisi olan Arı Algoritması kullanılarak düzlemsel dört çubuk mekanizmalarının optimum yörünge sentezi gerçekleştirilmiştir. Minimize edilecek amaç fonksiyonu, mekanizmanın bir çevrim yapması süresince takip edilecek biyel eğrisini oluşturulan noktalar ile mekanizma üzerinde bulunan bir biyel noktasının arasındaki mesafelerin karelerinin toplamı olarak alınmıştır. Düzlemsel dört çubuklu mekanizmasının optimal tasarımı, Grashof kuralını karşılayacak ve istenen biyel eğrisi minimum hata ile takip edilecek şekilde yapılmıştır. Bu çalışma, zamanlama olmadan dört çubuk mekanizmasının istenen yörüngeyi takip edeceği düşünülmüştür. Arı Algoritması kullanılarak istenen kısıtlara uygun olarak dört çubuk mekanizması uzuv boyutları hesaplanmıştır. Örnek bir uygulama üzerinde kullanılan algoritmanın etkinliği ve hassasiyeti gösterilmiştir. Sayısal uygulama sonuçları grafiksel olarak verilmiştir.

ANAHTAR KELİMELEER: Düzlemsel dört çubuk mekanizması, yörünge sentezi, optimizasyon, Arı Algoritması.

GİRİŞ

Dört çubuk mekanizması geçmişten bugüne en çok kullanılan mekanizmalardandır. Biri sabit ve üçü de hareketli olmak üzere dört uzuvdan meydana gelir. Uzuvar birbirine döner mafsallar ile bağlanmıştır. Dikiş makinelerindeki iplik alma mekanizmaları, diz dış iskeletlerinde, tarımsal ekim mekanizmalarında, canlılardaki eklemler, insan yürüyüş rehabilitasyon sistemlerinde, su altı manipülatörlerinde, robotik parmaklarda, bisiklet süspansiyonu, pantograf, kapı hidroliği, katlanabilir basamaklar ve katlanabilir sandalyeler, vites değiştirme bağlantıları, basmalı çöp tenekesi, buhar makineleri ve lokomotifler, ön cam sileceği, paketleme makinaları, araç yönlendirme sistemleri gibi bir çok alanda tek serbestlik dereceli olması dolayısıyla sıklıkla kullanılırlar. Dört çubuklu mekanizmalarının sentezi son yıllarda geniş çapta incelenmiştir Genel olarak, dört çubuklu mekanizmalarının yörünge sentezi üç sınıfa ayrılır: fonksiyon üretimi, yörünge üretimi ve hareket üretimi [1-11]. Bu çalışmada yörünge oluşturma sentezi problemi, uzuvarların uzunluğunu ve sabit eklemlerin koordinatlarını, biyelin düzlemindeki belirli bir noktanın istenen yörüngeyi oluşturacağı şekilde belirlenmiştir. İstenilen yörünge, hassas noktalar olarak bilinen bir dizi farklı noktayla tanımlanmıştır. Ayrıca, mekanizma sentezi problemi, optimizasyon problemine dönüştürülmüş ve Arı Algoritması kullanılarak mekanizma boyuları optimize edilmiştir.

YÖRÜNGE TAKİBİ İÇİN MATEMATİKSEL MODELLEME

Şekil 1 'de ele alınan düzlemsel dört çubuk mekanizmasının yörünge takibi için biyel eğrisi şematik olarak görülmektedir [12]. Burada r_1 ; sabit uzvun uzunluğu, r_2 ; giriş uzvunun uzunluğu, r_3 ; biyel uzvunun uzunluğu, r_4 ; çıkış uzvunun uzunluğudur. r_5 ve r_6 , biyel noktası D 'nin sırasıyla A ve B eklemini bağlayan çizgiye izdüşümü ve normal mesafesidir. θ_1 açısı, sabit uzvun yatay eksenindeki eğik açısıdır ve (x_0, y_0) , mekanizmanın X_0Y_0 koordinat sistemi üzerindeki sabit O ekseninin koordinatıdır. Düzlemsel dört çubuk mekanizması üzerinde tanımlanan kapalı vektör çevriminden aşağıdaki denklem yazılabilir:

$$\vec{r}_1 + \vec{r}_2 + \vec{r}_3 + \vec{r}_4 = \vec{0}$$

Bu denklem, θ_3 ve θ_4 için gerçek ve sanal kısımları sıfıra eşitlenerek çözülürse aşağıdaki şekilde elde edilir:

$$\theta_4 = 2 \tan^{-1} \left[\left(B \pm \sqrt{A^2 + B^2 - C^2} \right) / (A + C) \right]$$

$$\theta_3 = \tan^{-1} [(r_4 \sin \theta_4 - r_2 \sin \theta_2) / (r_1 + r_4 \cos \theta_4 - r_2 \cos \theta_2)]$$

burada

$$A = 2r_4(r_1 - r_2 \cos \theta_2)$$

$$B = -2r_2r_4 \sin \theta_2$$

$$C = r_3^2 - r_1^2 - r_2^2 - r_4^2 + 2r_1r_2 \cos \theta_2$$

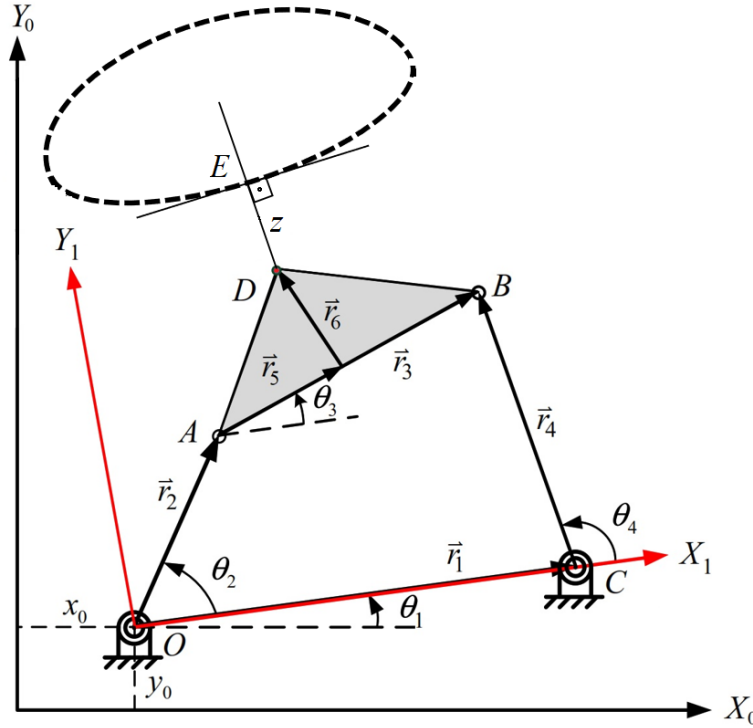
şeklindedir. X_1Y_1 koordinat sistemi üzerindeki D biyel noktasının koordinat bileşenleri (C_{x1} , C_{y1}) ise şu şekilde ifade edilebilir.

$$C_{x1} = r_2 \cos \theta_2 + r_5 \cos \theta_3 + r_6 \sin \theta_3$$

$$C_{y1} = r_2 \sin \theta_2 + r_5 \sin \theta_3 + r_6 \cos \theta_3$$

D biyel noktasının takip edilmesi arzu edilen yöründe üzerindeki nokta is E noktası olarak tanımlanmıştır. D ve E noktaları arasındaki en kısa mesafe z ise aşağıdaki şekilde tanımlanabilir:

$$z = \sqrt{(E_{x1} - D_{x1})^2 + (E_{y1} - D_{y1})^2}$$



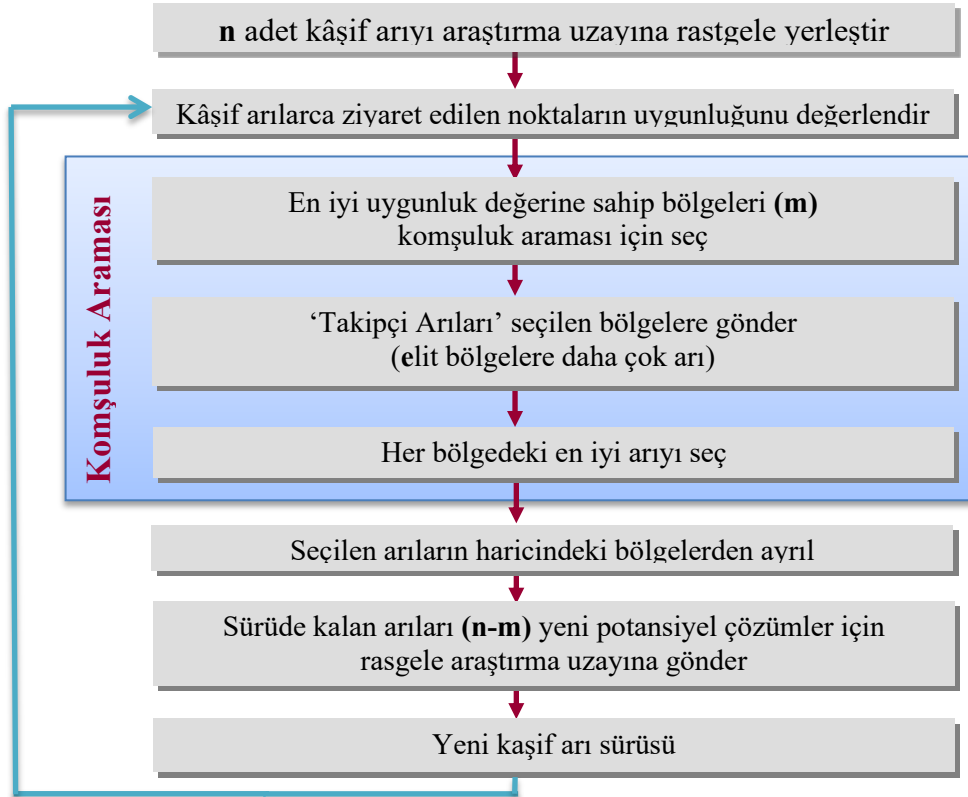
Şekil 1. Düzlemsel dört çubuk mekanizması biyel eğresi

ARI ALGORİTMASI

Bu çalışmada, optimizasyon probleminin çözümü için meta-sezgisel optimizasyon algoritması olan Arı Algoritması kullanılmıştır. İlk olarak 2006 yılında Pham ve ark. tarafından geliştirilmiş olan Arı Algoritması, bal arılarının kaynak (nektar, su vb.) arama davranışını taklit eden sürü zekâsı temelli bir tarama algoritmasıdır [13-27]. Şekil 2 'de Arı Algoritmasına ait akış şeması görülmektedir. Arı Algoritması optimizasyon yapılırken ayarlanması gereken bir dizi parametre içerir. Bunlar, ziyaret edilen n nokta içinden seçilen en uygun tarama bölge sayısı (m), kâşif arı sayısı (n), en iyi e tarama bölgesine gönderilen arı sayısı (nep), seçilen m adet tarama bölgesi içindeki elit tarama bölge sayısı (e), kalan ($m-e$) tarama bölgesine gönderilen arı sayısı (nsp), tarama bölgesi boyutu (ngh) ve durdurma kriteri olarak kabul edilen iterasyon sayısı (itr)'dır.

Optimizasyon problemi n adet kâşif arının tarama uzayına rastgele olarak gönderilmesi ile başlar. İkinci adımda kâşif arılarca taranan noktaların uygunlukları değerlendirilir. Üçüncü adımda n adet tarama bölgesi içerisinde daha uygun değere sahip m adet tarama bölgesi seçilir. Dördüncü ve beşinci adımda m adet tarama bölgesinde en iyi uygunluk değerine sahip elit tarama bölgeleri (e) ve geriye kalan tarama bölgeleri ($m-e$) seçilir. Bu bölgeler için komşuluk tarama boyutu (ngh) belirlenir. Seçilen tarama bölgelerinde komşuluk taraması için, daha gelecek vaateden çözümler

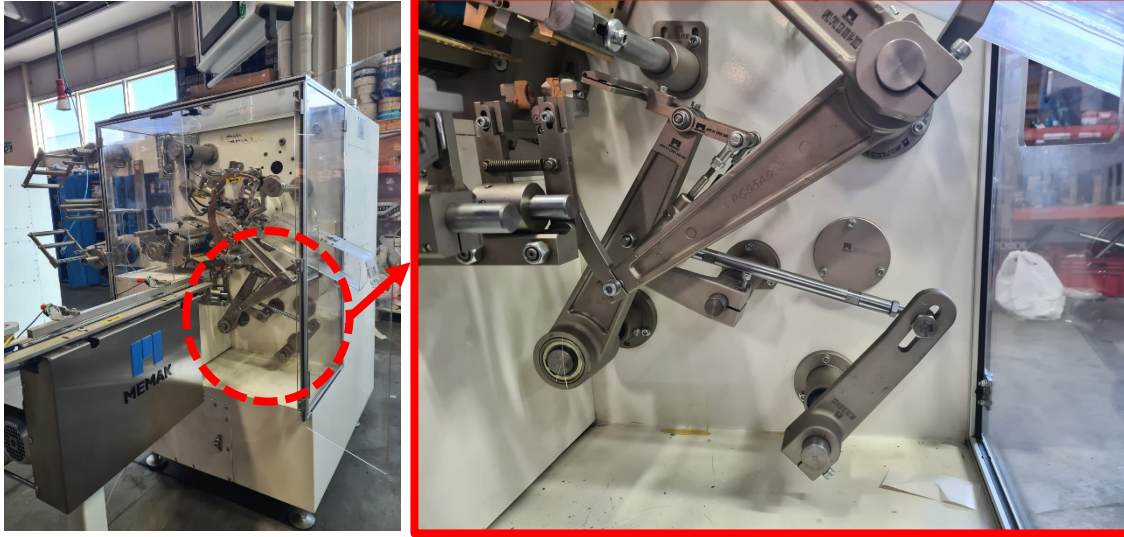
olan en iyi e tarama bölgesine seçilen diğer tarama bölgelerine göre daha fazla takipçi arı (nep), diğer tarama bölgelerine ise daha az takipçi arı (nsp) gönderilerek daha detaylı arama yapılır. Her tarama bölgesi içerisinde en uygun değere sahip arı seçilir. Altıncı, yedinci ve sekizinci adımda ise her tarama bölgesine en uygun değere sahip arı haricindeki diğer arılar tarama uzayından ayrılır. Sürüdeki diğer arılar (n-m) yeni potansiyel çözümler elde etmek için tekrar, rastgele olarak tarama uzayına gönderilirler. Optimizasyonun durdurulma kriteri (itr) sağlanıncaya kadar işlemlere devam edilir. Her bir iterasyondan sonra yeni sürü; seçilen her bir tarama bölgesinin temsilcileri ve rastgele tarama yapan kâşif arılardan oluşur.



Şekil 2. Arı Algoritması akış şeması

SAYISAL UYGULAMA

Ele alınan düzlemsel dört çubuk mekanizması, Memak Plastik Gıda Makina Sanayi Ticaret A.Ş. 'nin üretimi olan bir çikolata ambalajlama makinasında kullanılmaktadır (Şekil 3). Verilen bir yörüngeye karşılık mekanizmanın biyel eğrisinin bu yörüngeyi minimum hata ile takip etmesi istenmektedir. Yörünge takibi sırasında θ_2 açısının 360 derecelik hareketine karşın z mesafesi minimum olacak şekilde mekanizma boyutları optimize edilmiştir. Bu çalışmadaki mekanizma sentesi problemi çözümlerken kullanılan Arı Algoritması parametreleri Tablo 1'de verilmiştir.



Şekil 3. Memak Plastik Gıda Makina Sanayi Ticaret A.Ş. 'nin üretimi çikolata ambalajlama makinasındaki dört çubuk mekanizması

Tablo 1. Arı Algoritması parametreleri

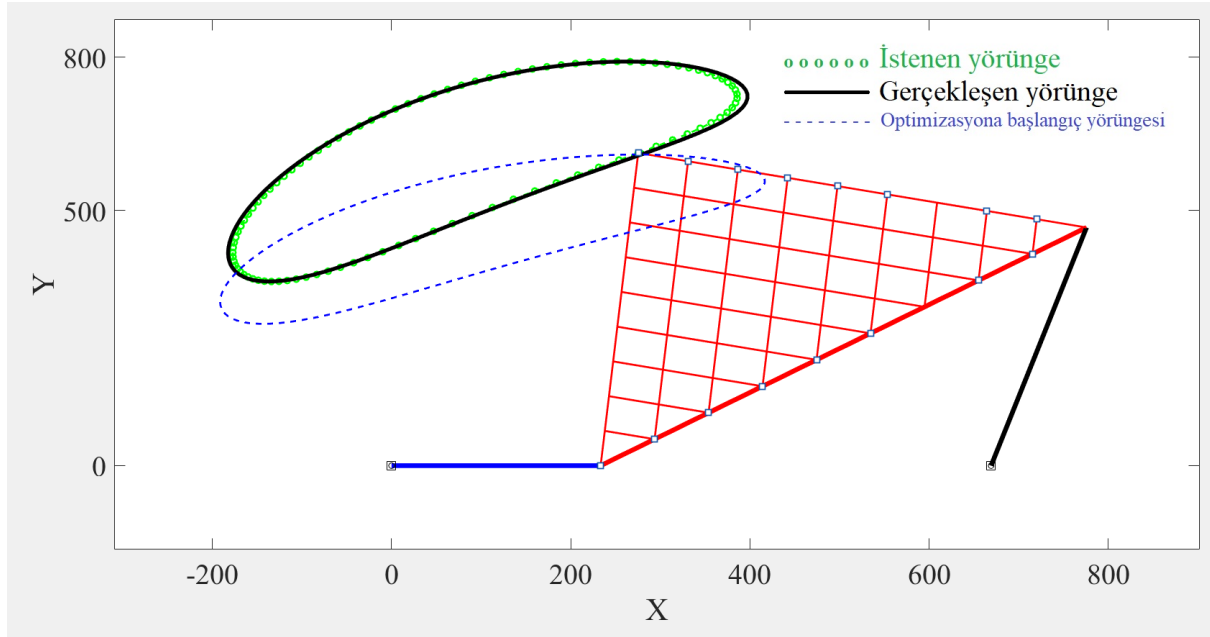
n	m	e	nep	nsp	ngh	itr
30	20	4	9	5	0.02	500

Şekil 3 'te dört çubuk mekanizması istenen yörüngeye karşı gerçekleştiren ve optimizasyon yapılması sırasında başlangıç olarak ele alınan mekanizmanın takip ettiği yörünge görülmektedir. Optimizasyon sonrası elde edilen sonuçlara göre birimleri mm olmak üzere mekanizma boyutları $r_1=669.12$, $r_2=233.32$, $r_3=715.28$, $r_4=478.45$, $D_{X1}=431.14$, $D_{Y1}=436.82$ olarak bulunmuştur.

SONUÇ

Bu çalışmada, meta-sezgisel optimizasyon algoritması olan Arı Algoritması kullanılarak düzlemsel dört çubuk mekanizmalarının optimum yörünge sentezi gerçekleştirilmiştir. Amaç fonksiyonu, mekanizmanın bir çevrim yapması süresince takip edilecek biyel eğrisini oluşturulan noktalar ile mekanizma üzerinde bulunan bir biyel noktasının arasındaki mesafelerin karelerinin toplamı olarak alınmıştır. Düzlemsel dört çubuklu mekanizmasının optimal tasarımı, Grashof kuralını karşılayacak ve istenen biyel eğrisi minimum hata ile takip edilecek şekilde yapılmıştır. Bu çalışma, zamanlama olmadan dört çubuk mekanizmasının istenen yörüngeyi takip edeceği düşünülmüş ve yörünge noktalar şeklinde tanımlanmıştır. Arı Algoritması kullanılarak istenen kısıtlara uygun olarak dört çubuk mekanizması uzuv boyutları hesaplanmıştır. Optimizasyon sonucu; istenen yörünge ile gerçekleşen yörünge arasında determinasyon katsayısı (R^2) 0.97 olmuştur. Grashof kuralını karşılayacak ve istenen biyel eğrisini minimum hata ile takip edilecek şekilde Arı Algoritması kullanılarak mekanizmanın optimum yörünge sentezi başarı ile

gerçekleştirilmiş ve gelecekte dört çubuk mekanizmalarının yörünge sentezi için Arı Algoritması'nın etkili bir optimizasyon aracı olarak kullanılabileceğini gösterilmiştir.



Şekil 3. Dört çubuk mekanizması yörünge takibi

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CENTERS FORMED BY THE DONOR LEVEL *Sb* DOPING IN THE *Ge-Si* CRYSTAL**Sevil LATIFOVA**

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ABSTRACT

A donor level was observed as a result of thermal treatment in antimony-doped Ge-Si solid solution single crystal. It was determined that this level was close to the conduction band, with an energy of 0.04 eV . The activation energies of donors were determined according to the temperature dependence of the concentration of charge carriers. The concentration of silicon atoms in the studied crystal was 18 at\% . It was determined that the donor level in the Ge-Si crystal is formed due to the complete compensation of Sb centers and the thermal activity of the acceptor levels.

In this case, the already V^- singly charged vacancy adds one more electron to itself. As the concentration of free electrons decreases in the conduction band, the value of R increases. The concentration of ionized centers also increases here. This increases the share of scattering from ionized dopant centers. Therefore, at these temperatures, the conductivity decreases appreciably, but the subsequent increase in temperature increases the contribution of scattering from thermal oscillations.

Therefore, the previous law of displacement is restored. It became clear that the thermal donor level is formed due to doubly charged vacancies and positively charged antimony atoms. The temperature dependence of the mobility of charge carriers is well explained by the proposed model. The conductivity of the crystals before and after thermal treatment was n-type. In both samples, it is observed that donor-type dopant centers with small activation energy are formed in the crystals in the low temperature region after thermal processing. The saturation of R near $T=77\text{K}$ in curve 3 indicates that some of the centers of Sb remain uncompensated. This allows to calculate the concentration of thermal donor centers.

The concentration of thermal donors is approximately half that of Sb. From here, the price obtained for the depth of the donor centers coincides with the price we received earlier.

KEYWORDS: thermal processing, donor centers, Hall coefficient charge carriers, scattering fraction, solid solution, additive level, liquid nitrogen.

Ge-Si KRİSTALİNDE DONÖR DÜZEYİNDE Sb DOPİNGİNİN OLUŞTURDUĞU MERKEZLER

ÖZET

Antimon katkılı Ge-Si katı çözeltisi tek kristalinde ısıtma işlemi sonucunda donör seviyesi gözlemlendi. Bu seviyenin 0,04 eV enerjiyle iletim bandına yakın olduğu belirlendi. Donörlerin aktivasyon enerjileri, yük taşıyıcıların konsantrasyonunun sıcaklığa bağımlılığına göre belirlendi. İncelenen kristaldeki silikon atomlarının konsantrasyonu %18 idi. Ge-Si kristalindeki donör seviyesinin, Sb merkezlerinin tamamen dengelenmesi ve alıcı seviyelerinin termal aktivitesinden dolayı oluştuğu belirlendi.

Bu durumda, zaten V^- -tek yüklü boşluk kendisine bir elektron daha ekler. İletim bandında serbest elektronların konsantrasyonu azaldıkça R'nin değeri artar. İyonlaşmış merkezlerin konsantrasyonu da burada artar. Bu, iyonize katkı merkezlerinden saçılmanın payını artırır. Dolayısıyla bu sıcaklıklarda iletkenlik önemli ölçüde azalır, ancak daha sonra sıcaklıktaki artış termal salınımlardan kaynaklanan saçılmanın katkısını artırır.

Bu nedenle, önceki yer değiştirme yasası geri yüklenir. Termal donör seviyesinin çift yüklü boşluklar ve pozitif yüklü antimon atomları nedeniyle oluştuğu ortaya çıktı. Yük taşıyıcılarının hareketliliğinin sıcaklığa bağımlılığı önerilen model tarafından iyi bir şekilde açıklanmaktadır.

Kristallerin ısıtma işlemi öncesi ve sonrası iletkenliği n-tipindeydi. Her iki örnekte de ısıtma işlemi sonrası düşük sıcaklık bölgesindeki kristallerde aktivasyon enerjisi küçük donör tipi katkı merkezlerinin oluştuğu gözlemlenmiştir. Eğri 3'te R'nin $T=77K$ yakınında doyması, Sb'nin bazı merkezlerinin telafi edilmeden kaldığını gösterir. Bu, termal donör merkezlerinin konsantrasyonunun hesaplanmasına olanak sağlar.

Termal donörlerin konsantrasyonu Sb'nin yaklaşık yarısı kadardır. Buradan donör merkezlerinin derinliği için elde edilen fiyat daha önce aldığımız fiyat ile örtüşmektedir.

ANAHTAR KELİMELEER: ısıtma işlemi, donör merkezleri, Hall katsayılı yük taşıyıcıları, saçılma fraksiyonu, katı çözelti, katkı seviyesi, sıvı nitrojen.

INTRODUCTION

During the thermal processing of samples with n-type conductivity, it was revealed that new donor centers appeared in the crystals. This donor level itself is observed when the shallow donor centers created by the addition of *Sb* are practically fully compensated, but the type (n-type) remains unchanged.

The transformation of the sample into n-type after heating and sharp cooling indicates that the concentration of thermal acceptor centers formed at the heating temperature is greater than the concentration of Sb in it.

Some of the more interesting results observed on samples with n-type conductivity are shown in figure 1. The crystal was heated for one hour at $940^{\circ}C$ (curve 2) and $910^{\circ}C$ (curve 3) and then

quenched. The concentration of these crystals was chosen in such a way that it was possible to detect the thermal donor level in them, and that the scattering of charge carriers from the ionized dopant center was noticeable.

The fulfillment of the last condition was achieved by taking the concentration of Sb in the crystal as large as possible. ($N_{Sb} \sim 5 \cdot 10^{16} \text{ cm}^{-3}$).

The conductivity of the crystals before and after thermal treatment was n-type. In both samples, it is observed that donor-type dopant centers with small activation energy are formed in the crystals in the low temperature region after thermal processing. The saturation of R near $T=77\text{K}$ in curve 3 indicates that some of the centers of Sb remain uncompensated. This allows to calculate the concentration of thermal donor centers.

The concentration of thermal donors is approximately half that of Sb. From here, the price obtained for the depth of the donor centers coincides with the price we received earlier.

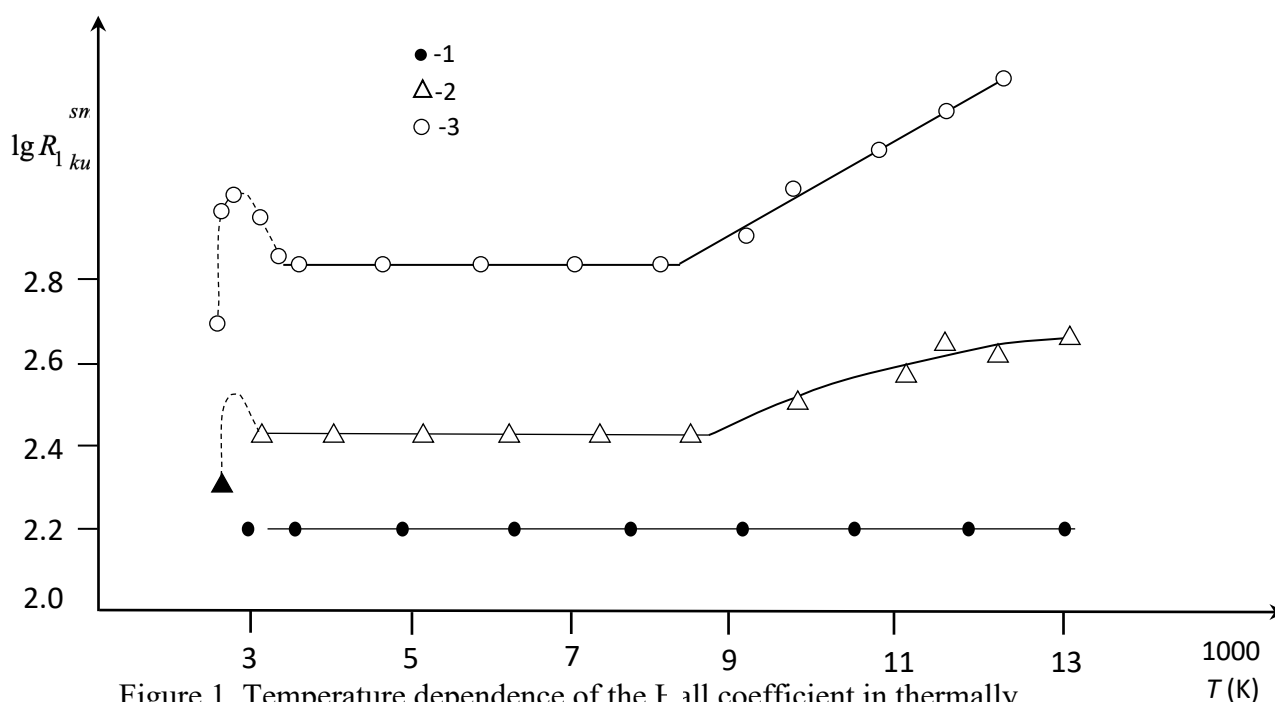


Figure 1. Temperature dependence of the Hall coefficient in thermally treated (2,3) and untreated (1) samples with n-type conductivity

In the upper temperature region in Figure 1, R begins to increase as the temperature is increased. That is, as the temperature increases, the concentration of charge carriers begins to decrease. This seems incomprehensible at first glance. However, studies on the mechanism of formation of thermal donors allow us to understand its cause. Before commenting on this, let us refer to a fact that helps to understand it. In Figure 2, the temperature dependence of the charge carriers' drag (μ) of the samples characterized by curves 1 and 2 in Figure 1 is given with appropriate numbers. As can be seen, creep increases with increasing temperature before thermal treatment (curve 1). Such dependence is typical for the scattering mechanism of charge carriers from ionized additive centers. After thermal processing (curve 2), the temperature dependence of the conductivity is characterized by the scattering mechanism of the charge carriers from thermal oscillations of the crystal and alloy irregularities. In the upper temperature range, the creep (at low temperature)

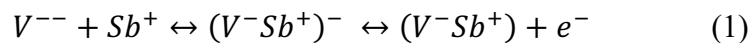
suddenly decreases significantly, and with the subsequent increase in temperature, the previous dependence is restored. Examining the results obtained from thermal processing studies, it is possible to make a reasonable opinion about the mechanism of thermal defects.

First of all, it is clear that the first and second thermal acceptor levels are related to two different degrees of ionization of the same kind of defects. It can be thought that such defects are related to vacancies created in the crystal as a result of heating at high temperatures. Indeed, it is known that vacancies in *Ge* (and in *Si*) (we will denote the vacancy by the letter *V*) can alternately accept one and two electrons. This will lead to the formation of two acceptor levels with different depths in the crystal.

It can be assumed that the acceptor centers formed as a result of thermal processing are related to vacancies. In this case, the concentration of the first and second thermal acceptor centers should be equal to each other. The calculations in the work show that $N_{a_1}^{(T)} = N_{a_2}^{(T)}$ within the error of the experiment.

Thermal donor centers are observed when the conductivity of the crystal is n-type. However, at high temperatures, vacancies appear regardless of the type of crystal.

Therefore, the emergence of thermal donor centers should be related to vacancies. It is possible to observe the thermal donor centers when each of the vacancies is charged with two electrons. In the *Sb*-doped crystal, the *Sb* centers consist of singly ionized positively charged atomic residues. Now imagine that a doubly negatively charged vacancy and a singly positively charged *Sb* atom in the crystal meet each other. I wonder what will happen in this case? It is clear that these centers, having charges of different signs, will attract each other. As a result, a doubly negatively charged vacancy plus a singly positively charged *Sb* atom complex will form. We can show it schematically like this:



Indeed, such a scheme allows to explain all observed empirical facts. After the $(V^{-}Sb^{+})^{-}$ ion pair splits, the second electron for the ion pair, which is neutral in terms of electric charge, seems to be redundant (it is not needed). The second electron can easily leave the ion pair. Therefore, the activation energy of the donor center created by such a complex is small ($\approx 0,04eV$).

For the formation of such an ion complex, at least one of its constituent components must have a sufficient speed of movement (more precisely, diffusion) in the crystal. The diffusion rate of *Sb* in the crystal is very small. However, the vacancy (even in doubly ionized form) can migrate in the crystal with a fairly large speed. It can also be assumed that the vacancy does not need to migrate very far to combine with the *Sb* ion. Because during heating in the crystal, vacancies first appear at such points where there is a certain mechanical stress. Such points are, of course, the immediate vicinity of the nodes where *Sb* atoms are located. Therefore, the created vacancy does not need to travel a great distance to "find" the *Sb* atom.

The scheme of formation of thermal donors described here is also confirmed by the law of dependence of charge carrier mobility on temperature.

In Fig. 2, before thermal processing (curve 1), the scattering fraction of charge carriers from ionized dopant centers (positively charged *Sb* atoms) is significant.

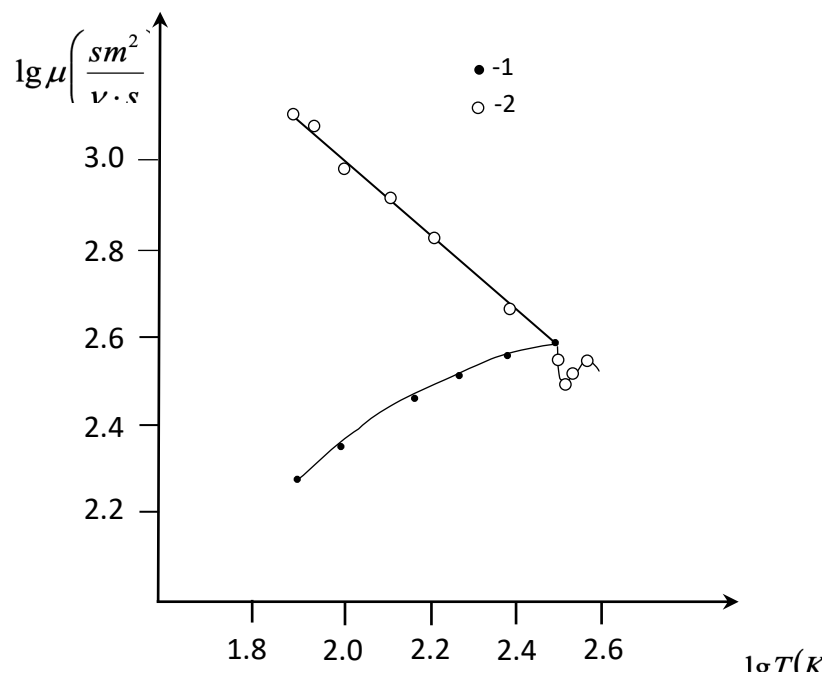
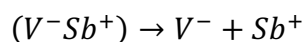


Figure 2. Before thermal operation in a crystal with n-type conductivity (curve 1) and then (curve 2) the temperature dependence of viscosity.

After thermal treatment, the crystal is almost fully compensated. If the resulting ion centers were to act individually, then the scattering at the ionized dopant centers would be even greater and, as a result, the drag would be greatly reduced. However, the opposite happened in the n-type sample (curve 2) after thermal treatment. The cost of this increase in liquid nitrogen temperature is even greater. In addition, in figure 1, at the temperatures corresponding to the observed anomalous increase of R in the upper temperature region, curve 2 (figure 2) shows a significant decrease in creepage and the restoration of the previous regularity with the subsequent increase in temperature. We can explain them as follows: when we start to raise the temperature at the boiling point of nitrogen (Fig. 2, curve 2), the thermal donor centers gradually give their second electrons to the conduction zone and turn into an ion pair ($V^- Sb^+$). After the centers are completely depleted, the concentration of electrons remains unchanged (this coincides with a constant value of R). Finally, the temperature reaches such a value that the neutral ion pairs themselves dissociate:



In this case, the already V^- - singly charged vacancy adds one more electron to itself. As the concentration of free electrons decreases in the conduction band, the value of R increases. The concentration of ionized centers also increases here. This increases the share of scattering from ionized dopant centers. Therefore, at these temperatures, the conductivity decreases appreciably, but the subsequent increase in temperature increases the contribution of scattering from thermal oscillations. Therefore, the previous law of displacement is restored.

If the specific conductivity did not arise in the crystal with the increase in temperature, then saturation in the value of R would be observed after the ion pairs were completely dissociated. However, the formation of specific conductivity does not allow to observe this saturation. So, the proposed mechanism allows to explain all experimental facts obtained as a result of thermal processing.

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FREQUENCY OF HOME ACCIDENTS IN CHILDREN AGED 1-14 AND EVALUATION OF THEIR PARENTS FIRST AID KNOWLEDGE AND HEALTH LITERACY IN HOME ACCIDENTS: KÜTAHYA EXAMPLE

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ABSTRACT

This study aimed to determine the frequency of home accidents in children and to evaluate the relationship between the level of first aid knowledge given in case of accident and health literacy.

This cross-sectional study was conducted between November and December 2022; The population is 97,814 people with children between the ages of 1-14 in the central district of Kütahya province. The sample size was found to be 383 people. The sample was selected by simple random method. Data were collected through a data collection form consisting of sociodemographic characteristics, Home Accident First Aid Self-Efficacy Scale and Health Literacy Scale (HLS-14).

Statistical analyzes were performed with the SPSS 25.0 package program. Mann Whitney U test, Kruskal Wallis Test and Spearman correlation test were used in statistical analyses. $p < 0.05$ was considered significant.

Of the 444 parents participating in the study; 292 (65.8%) were women and 207 (46.6%) were high school graduates. 210 (47.2%) of the participants had children between the ages of 1-4, and 147 (70%) had a home accident in the last year. 189 (42.5%) of the participants had children between the ages of 5-6 and 147 (77.7%) had an accident at least once in the last year. 192 (43.2%) of the participants had children between the ages of 7-14 and 140 (72.9%) had an accident at least once in the last year. The most common accidents in all three age groups are; These were falls, impacts, sprains and insect bites. HLS-14 Score was higher in those who were women, married, employed, and had a university degree or higher ($p < 0.05$). There was a low significant positive correlation between the Home Accident First Aid Self-Efficacy Scale and the HLS-14 scale ($r = 0.116$; $p = 0.014$).

According to this study; It may be beneficial for parents to be informed about prevention and first aid in the types of accidents they may frequently encounter, such as falls, sprains and insect bites. According to this study; education level, health literacy level; Health literacy was also found to positively affect the level of first aid knowledge. Increasing both education and health literacy levels of the society will contribute positively to self-efficacy in first aid application in home accidents.

KEYWORDS: Home accident with children, Health literacy.

1-14 YAŞ ARASI ÇOCUKLARDA EV KAZASI SIKLIĞI VE EBEVEYNLERİNİN EV KAZALARINDAKİ İLK YARDIM BİLGİSİ İLE SAĞLIK OKURYAZARLIĞININ DEĞERLENDİRİLMESİ: KÜTAHYA ÖRNEĞİ

ÖZET

Bu çalışmada çocuklarda ev kazası sıklığının belirlenmesi ve kaza durumunda yapılan ilk yardım bilgi düzeyinin sağlık okuryazarlığı ile ilişkisinin değerlendirilmesi amaçlandı.

Bu kesitsel çalışma Kasım-Aralık 2022 tarihleri arasında yapılmış olup; evreni Kütahya ili Merkez ilçedeki 1-14 yaş arası çocuğu olan 97,814 kişidir. Örneklem büyüklüğü 383 kişi olarak bulundu. Örneklem basit rasgele yöntem ile seçildi. Veriler, sosyodemografik özellikler, Ev Kazalarında İlk Yardım Öz Etkililik Ölçeği ve Sağlık Okuryazarlığı Ölçeği'nden (HLS-14) oluşan veri toplama formu aracılığıyla ile toplandı.

İstatistiksel analizler SPSS 25.0 paket programı ile yapıldı. İstatistik analizlerde Mann Whitney U testi, Kruskal Wallis Testi ve Spearman korelasyon testi kullanıldı. $p<0.05$ anlamlı olarak kabul edildi.

Çalışmaya katılan 444 ebeveynin; 292'si (%65,8) kadın, 207'si (%46,6) lise mezunuydu. Katılımcıların 210'unun (%47,2) 1-4 yaş aralığında çocuğu olup, 147'si (%70) son bir yıl içerisinde ev kazası geçirmişti. Katılımcıların 189'unun (%42,5) 5-6 yaş aralığında çocuğu olup 147'si (%77,7) son bir yıl içerisinde en az bir kez kaza geçirmişti. Katılımcıların 192'sinin (%43,2) 7-14 yaş aralığında çocuğu olup 140'ı (%72,9) son bir yıl içerisinde en az bir kez kaza geçirmişti. Her üç yaş grubunda en sık görülen kazalar; düşme, çarpma burkulma ve böcek sokması idi. Kadın, evli, çalışan, eğitim durumu üniversite ve üstü olanlarda HLS-14 Puanı daha yüksekti ($p<0,05$). Ev Kazalarında İlk Yardım Öz-Yeterlik Ölçeği ile HLS-14 ölçeği arasında pozitif yönde düşük derecede anlamlı bir korelasyon vardı ($r=0,116$; $p=0,014$).

Snuç: Bu çalışmaya göre; ebeveynlere, sıklıkla karşılaşılabilecekleri düşme, burkulma ve böcek ısırıkları kaza türlerinde, korunma ve ilkyardım konusunda öncelikle bilgilendirilmeleri faydalı olabilir. Bu çalışmaya göre; eğitim düzeyi, sağlık okuryazarlığı düzeyini; sağlık okuryazarlığı da ilkyardım bilgi düzeyini olumlu etkilediği saptandı. Toplumun hem eğitim hem de sağlık okuryazarlığı düzeylerinin artırılması ev kazalarında ilk yardım uygulamasında öz yeterliliğe olumlu katkı sağlayacaktır.

ANAHTAR KELİMELER: Çocuklarda ev kazası, Sağlık okuryazarlığı.

EVALUATING THE PROTECTIVE ROLE OF SELENIUM AGAINST CISPLATIN-INDUCED LIVER DAMAGE USING NGAL AND GALECTIN-3 BIOMARKERS

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ABSTRACT

This study was conducted to investigate the effects of selenium on cisplatin-induced hepatotoxicity in rats using NGAL and Galectin-3 biomarkers. The study included 24 Wistar Albino male rats divided into four groups: control, cisplatin, selenium, and cisplatin + selenium. The experimental model was created on the 39th day after the rats were born. The control group was given only physiological saline (SF, 2ml i.p.). A single dose of 7.5 mg/kg cisplatin was administered intraperitoneally (i.p.) to the cisplatin group. The selenium group was given 1mg/kg/day selenium by gavage for 21 days. To the cisplatin + selenium group, 1 mg/kg/day selenium was given by gavage for 21 days and a single dose of 7.5 mg/kg cisplatin was administered. The rats were sacrificed three days after cisplatin administration and their liver tissues were taken. Although there was no significant difference between the groups in the NGAL level in the liver tissue, an increase in the NGAL level was found in the cisplatin group compared to the other groups. There was a significant increase in the galectin-3 level in the cisplatin group compared to the other experimental groups, and a decrease in the cisplatin group with selenium supplementation. As a result, it was found that selenium could reduce NGAL and Galectin-3 expression levels in hepatotoxicity caused by cisplatin. It is also thought that selenium can be used as an inhibitor of NGAL and Galectin-3.

Key Words: hepatotoxicity, NGAL, Galectin-3, cisplatin, selenium.

INTRODUCTION

The liver is our most important organ, which has a close relationship with all systems of the body and has extremely vital functions. Hepatocytes form the basic structure of the liver (Cheng, Nakib, Perciani, & MacParland, 2021). These cells are specialized in regulating toxic effects in the organism (Trefts, Gannon, & Wasserman, 2017). Cisplatin is one of the drugs that can have toxic effects on the body. Cisplatin was approved by the FDA in 1978 and is used as a chemotherapeutic agent in many cancer treatments. (Ghosh, 2019). The mechanism of action of cisplatin involves cross-linking with purine bases on DNA, interfering with DNA repair mechanisms, causing DNA damage and subsequently inducing apoptosis in cancer cells (Dasari & Tchounwou, 2014). Many antioxidant substances (rutin, curcumin, melatonin, N-acetylcysteine, etc.) have been used to prevent or reduce the toxic effects of cisplatin. (Basol, Savas, Meral, & Erbas, 2018; Elsherbiny, Eladl, & Al-Gayyar, 2016; Güntürk; Kandemir, Hanedan, Aktaş, Küçükler, & Çağlayan, 2020).

An antioxidant is the defense mechanism developed by living organisms to prevent and eliminate the harmful effects of free radicals in cells. These mechanisms act by preventing the production of

free radicals or eliminating the harmful effects of the radicals formed, protecting the cell against their toxic effects and preventing diseases. (Gulcin, 2020; Shahidi & Zhong, 2015). Selenium (Se) is an important antioxidant and an essential element for the human body (Du, Zhang, Lu, & Holmgren, 2012; Lu & Holmgren, 2014) (Avery and Hoffmann, 2018). Selenium is found in foods such as grains, nuts, vegetables, fish, meat, dairy and poultry. (Finley, 2006). The primary dietary form of Se is selenomethionine, which is metabolized to selenite in the liver. Selenite is used for the synthesis of selenoproteins and enzymes, including glutathione peroxidase (GPx), which acts as a crucial antioxidant. (Polyzos, Kountouras, Goulas, & Duntas, 2020). Selenium has recently been identified as an anticarcinogen (Murdolo et al., 2017). Selenium levels decrease in cirrhosis and chronic hepatitis and there are significant liver changes in rats with selenium deficiency (Al-Bader et al., 1998; CANORUÇ et al., 2006)

Galectins are members of the newly identified family of animal lectins, of which galectin-3 is the most extensively studied. (Hsu et al., 1999). It has been reported that normal hepatocytes that do not express galectin-3 can differentiate into galectin-3-expressing cells in association with neoplastic transformation. (Hsu et al., 1999). Galectins play an important and complex role in intracellular pathways and disease mechanisms. Galectin-3 is a multifunctional protein involved in many biological processes such as fibrosis, angiogenesis, apoptosis and immune activation, its most important role is in acute and chronic inflammation. (de Oliveira et al., 2017). Different experimental hepatotoxicity models have demonstrated that Galectin-3 plays an important role in oxidative stress, damage and hepatic fibrosis. (D. D. Santos et al., 2023).

Neutrophil gelatinase-associated lipocalin (NGAL) is a 25-kDa protein from the lipocalin family and is synthesized in renal tubular, intestinal, hepatic, and pulmonary tissues. Its synthesis increases markedly with tissue damage, especially in the kidney (Alhaddad et al., 2015; Haase et al., 2009).

The molecular mechanisms by which these two proteins modulate cellular responses, particularly in cisplatin-induced liver toxicity, are not yet known.

In addition, despite several studies that have improved our understanding of the role of NGAL and Galectin-3 in liver injury (Abd Rashid et al., 2021; Diego D Santos et al., 2023), no studies have demonstrated the effect of selenium on NGAL and Galectin-3 biomarkers and cisplatin-induced hepatotoxicity.

In this study, we will attempt to reveal the effect of selenium on possible hepatotoxicity caused by cisplatin through changes in NGAL and Galectin-3 levels.

MATERIAL AND METHOD

Experimental Animals

In this study, we used 24 male Wistar albino rats, aged 60 days and weighing 180-200 g, which were produced at the Experimental Medicine Application and Research Center of Selcuk University. The rats were divided into four groups: the control group, the cisplatin group, the cisplatin + selenium group, and the selenium group.

This study adhered to the guidelines outlined in the Guide for the Care and Use of Laboratory Animals to ensure the protection of animal rights. Approval was obtained from the Animal Experiments Ethics Committee of Selcuk University Experimental Medicine Application and Research Center with decision number 2023-71, dated November 24, 2023. The use of unnecessary experimental animals was avoided, and ethical principles were followed to prevent the infliction of pain on the experimental subjects.

Administration of Cisplatin and Selenium

Control group (n = 6): Only a single dose of 2 ml of serum physiological was intraperitoneally administered to the rats in the control group on the same day as cisplatin administration in two of the experimental groups.

Selenium group (n = 6): Selenium was administered at a dose of 1 mg/kg by gavage every day for 21 days.

Cisplatin group (n = 6): A single dose of 7.5 mg/kg of cisplatin was intraperitoneally administered to the rats in this group only on the 57th day (Kumburovic et al., 2019).

Cisplatin + selenium group (n = 6): A single dose of cisplatin was intraperitoneally administered at a dose of 7.5 mg/kg on the 57th day, and selenium was administered at a dose of 1 mg/kg by gavage every day for 21 days (Antunes, Darin, & Bianchi Nde, 2001; Kumburovic et al., 2019).

Analysis of NGAL and Galectin-3 Levels

Following the homogenization of the tissues that were stored at -80 °C, the samples were treated with 0.01 M phosphate-buffered saline and placed in 96-well plates prepared for each parameter kit. The biotin antibody and horseradish peroxidase conjugate were added, and the samples were incubated at 37 °C. After adding the substrate reagent, each well was analyzed spectrophotometrically for both galectin-3 and NGAL at a wavelength of 450 nm using an enzyme-linked immunosorbent assay device.

Statistical Analysis

Significant differences were determined using the one-way analysis of variance test, and pairwise comparison of the groups was undertaken using the post-hoc Student-Newman-Keuls test. Sigma Stat 3.5 software was used for statistical analysis, and Origin Pro 9.1 software was used to draw graphs. The significance level was accepted as $p < 0.05$.

RESULTS

Analysis of The NGAL Levels by ELISA

Although there was no statistically significant result in the liver tissue NGAL levels of the control and experimental group rats, the NGAL level increased in the cisplatin group. ($p > 0.05$). (Fig.1)

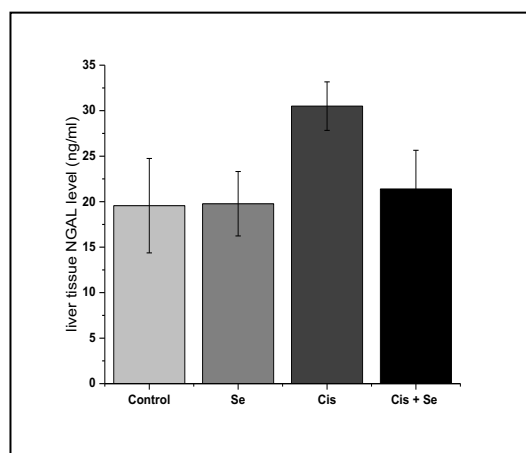


Fig. 1 .: Selenium levels in liver tissue of rats in control and experimental groups. Values are given as mean \pm standard error) (n=6).

Analysis of Galectin-3 Levels by ELISA

Galectin-3 levels in liver tissue increased in the cisplatin group compared with both the control and se groups ($p < 0.001$). Galectin-3 levels decreased in the cis +se group compared with the cis group ($p < 0.001$) (Fig.2)

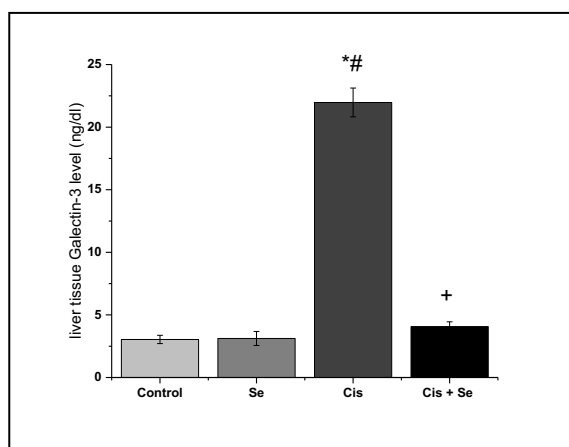


Fig. 2.: Selenium levels in the liver tissue of rats in the control and experimental groups. Values are given as mean \pm standard error) (n=6). *: Indicates a significant difference compared to the control group. #: Indicates a significant difference according to the selenium group. +: indicates a significant difference compared to the cisplatin group.

DISCUSSION AND CONCLUSION

In this study, the effect of selenium on possible hepatotoxicity caused by cisplatin was revealed by changes in NGAL and Galectin-3 levels. NGAL synthesis occurs in very low amounts in healthy people. (Kjeldsen, Johnsen, Sengeløv, & Borregaard, 1993). Cisplatin causes damage to the liver, especially the parenchyma, and degeneration of hepatocytes. (Kaymak et al., 2022). In studies, liver toxicity of cisplatin is observed 5 days after injection (Omar et al., 2016). Another study by

Pezeshki et al. showed that AST increased 75-100 hours after cisplatin injection, but found a decrease in ALT levels 75 hours after cisplatin application (Pezeshki et al., 2017). In our study, the sacrifice of rats occurred 3 days after the injection. Therefore, in our study, no statistical significance was found between ASL and ALT levels between the control group and the cisplatin group.

It has been shown that NGAL is expressed in low amounts in the kidney, prostate, lung, thymus, liver, respiratory and digestive tract epithelium. NGAL expression has been shown to increase in tissues and body fluids in many diseases, including malignant tumors, inflammations, ischemic and metabolic disorders originating from these organs. (Chakraborty, Kaur, Guha, & Batra, 2012) (Alhaddad et al., 2015; Chang et al., 2018). In our study, although the NGAL level was not statistically significant, it was higher in the cisplatin group than in the control group. There was a decrease in the NGAL level in the liver tissue of the cisplatin + selenium group compared with the cisplatin-only group. This suggests that selenium may reduce the possible liver tissue toxicity caused by cisplatin, which has a decreasing effect on NGAL levels.

In studies including alcoholic cirrhosis, non-alcoholic cirrhosis and hepatitis cirrhosis, it has been reported that Galectin-3 is a good marker of fibrosis in cirrhosis and toxic hepatitis, reflecting the stage of liver damage, and that Galectin-3 levels increase in these diseases. (Gudowska et al., 2015; Wanninger et al., 2011). Different experimental hepatotoxicity models have shown that Galectin-3 plays an important role in oxidative stress, damage and hepatic fibrosis (Abu-Elsaad, Elkashef, & pharmacology, 2016; Dragomir et al., 2012). Consistent with these studies, a statistically significant increase in Galectin-3 levels was found in the cisplatin group in our study. However, in the cisplatin+selenium group, Galectin-3 level decreased significantly.

It is thought that selenium may reduce the possible liver tissue toxicity caused by cisplatin by decreasing the Galectin-3 level. The increase in galectin-3 level in the cisplatin group suggests that Galectin-3 can be used as a more important early biomarker in liver toxicity than NGAL. However, there is a need for studies explaining the mechanisms through which selenium is effective in cisplatin-induced liver toxicity

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THE EFFECT OF WORK-FAMILY CONFLICT ON ORGANIZATIONAL CYNISM: A RESEARCH ON THE HEALTH SECTOR

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ABSTRACT

Work-life and family life are critical dimensions that constitute the basic areas of individuals' lives. Individuals' roles in work and family areas significantly affect their living standards. The combination of these roles presents the challenge of balancing the individual's duties and responsibilities, and as a result, conflict may arise. This conflict arises from the diversity of roles in the individual's life and the difficulties arising from the interaction of duties and responsibilities. In this regard, identifying the antecedents of work-family conflict is critical for managers and researchers. Organizational cynicism refers to the negative attitudes and behaviors consciously adopted by working individuals. However, organizational cynicism involves employees' beliefs that their organizations lack moral integrity. These beliefs can be summarized as honesty, sincerity, and fairness sacrificed for organizational interests. In this context, this research discusses whether organizational cynicism can be an antecedent of work-family conflict. For this purpose, data was collected from 145 healthcare professionals living in Istanbul, Turkey, using scales. The results were analyzed using the least squares method through the SmartPLS program. The findings show that trait cynicism explains 49.8% of the variation in work-family conflict. ($R^2=0.498$; $p<0.001$). However, regression analysis results showed that organizational cynicism had an effect of 0.708 on work-family conflict. ($\beta=0.708$; $p<0.001$). The results show that healthcare professionals who want to overcome work-family conflict should first reduce the cognitive, emotional, and behavioral negativities they experience related to organizational cynicism.

KEYWORDS: Work-family conflict, organizational cynicism, health sector.

İŞ-AİLE ÇATIŞMASININ ÖRGÜTSEL SİNİZM ÜZERİNDEKİ ETKİSİ: SAĞLIK SEKTÖRÜNDE BİR ARAŞTIRMA

ÖZET

İş hayatı ve aile hayatı, bireylerin yaşamlarının temel alanlarını oluşturan kritik boyutlardır. Bireylerin iş ve aile alanındaki rol taşıma süreçleri, hayat standartları üzerinde önemli etkiler yaratmaktadır. Bu rollerin bir araya gelmesi, bireyin görev ve sorumluluklarını dengeleme zorluğunu beraberinde getirir ve sonuç olarak bir çatışma ortaya çıkabilir. Bu çatışma, bireyin yaşamındaki rol çeşitliliğinin yanı sıra, görev ve sorumlulukların etkileşiminden kaynaklanan zorluklardan kaynaklanmaktadır. Bu doğrultuda iş-aile çatışmasının öncüllerini saptamak yöneticiler ve araştırmacılar için kritik önemdedir. Örgütsel sinizm, çalışan bireylerin bilinçli olarak benimsediği olumsuz tutum ve davranışları ifade eder. Bununla birlikte örgütsel sinizm, çalışanların örgütlerinin ahlaki bütünlükten yoksun olduğuna dair inançları içerir. Bu inançlar, dürüstlük, samimiyet ve hakkaniyet gibi prensiplerin örgütsel çıkarlar için feda edildiği şeklinde ÖZETlenebilir. Bu çerçevede bu araştırma örgütsel sinizmin, iş-aile çatışmasının bir öncülü olup olamayacağını tartışmaktadır. Bu amaçla İstanbul'da yaşayan 145 sağlık çalışanından ölçek yardımıyla veri toplanmıştır. Elde edilen SmartPLS programı aracılığıyla en küçük kareler yöntemi kullanılarak analiz edilmiştir. Bulgular örgütsel sinizmin iş-aile çatışmasındaki değişimin %49,8'nin açıkladığını göstermektedir. ($R^2=0,498$; $p<0,001$). Bununla birlikte regresyon analiz çıktıları örgütsel sinizmin iş-aile çatışması üzerinde 0,708 oranında bir etkiye sahip olduğunu göstermiştir. ($\beta=0,708$; $p<0,001$). Sonuçlar iş-aile çatışmasının üstesinden gelmek isteyen sağlık çalışanlarının öncelikle örgütsel sinizmle ilgili yaşadıkları bilişsel, duygusal ve davranışsal olumsuzlukları azaltmaları gerektiğini göstermektedir.

ANAHTAR KELİMELE: İş-aile çatışması, örgütsel sinizm, sağlık sektörü.

THE MEDIATION ROLE OF PSYCHOLOGICAL CAPITAL IN THE RELATIONSHIP BETWEEN PROACTIVE PERSONALITY AND ENTREPRENEURIAL TENDENCY

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ABSTRACT

Indicators such as employment, national income and economic development in country economies are directly related to the strengthening and support of entrepreneurship. Therefore, it is critical to continuously develop individuals' entrepreneurial potential. In this context, which personality traits are effective on entrepreneurship tendency is an important research topic. Proactive personality refers to an individual's tendency to actively take action to achieve their goals. Additionally, psychological capital is a concept that addresses the positive aspects of individuals and represents an internal state that people need to be successful and improve themselves. This research analyzes the mediating role of psychological capital in this relationship by examining the effects of individuals' proactive personality traits on their entrepreneurial tendencies. In the study, proactive personality traits, psychological capital levels and entrepreneurial tendencies of 78 adult individuals were measured. The data obtained was analyzed using the Smart PLS 4 program. The results showed that proactive personality had a significant effect on psychological capital ($\beta=0.918$; $p<0.05$) and explained 84.3% of the changes in psychological capital ($R^2=0.843$; $p<0.05$). Additionally, it was determined that proactive personality had a significant effect on entrepreneurial tendency ($\beta=0.340$; $p<0.05$) and psychological capital had an effect on entrepreneurial tendency ($\beta=0.448$; $p<0.05$). The effect of both variables on entrepreneurship explains 59.5% ($R^2=0.595$; $p<0.05$) of the total changes. In addition, it was determined that the indirect effect of psychological capital was significant on the effect of proactive personality on entrepreneurial tendency. The findings show that individuals with proactive personality traits have a higher entrepreneurial tendency, and at the same time, individuals with high psychological capital further strengthen this effect. However, it emphasizes the importance of focusing on proactive personality traits and psychological capital in the development of programs and policies that evaluate entrepreneurial potential.

KEYWORDS: Entrepreneurial Tendency, Proactive Personality, Psychological Capital.

PROKTİF KİŞİLİK GİRİŞİMCİLİK EĞİLİMİ ARASINDAKİ İLİŞKİDE PSİKOLOJİK SERMAYENİN ARACILIK ROLÜ

ÖZET

Ülke ekonomilerindeki istihdam, ulusal gelir ve iktisadi kalkınma gibi göstergeler, girişimciliğin güçlenmesi ve desteklenmesiyle doğrudan ilişkilidir. Bu nedenle, bireylerin girişimcilik potansiyellerinin sürekli olarak geliştirilmesi kritik öneme sahiptir. Bu bağlamda, hangi kişilik özelliklerinin girişimcilik eğilimi üzerinde etkili olduğu önemli bir araştırma konusudur. Proaktif kişilik, bir bireyin hedeflerine ulaşmak için aktif bir şekilde harekete geçme eğilimini ifade eder. Ayrıca, psikolojik sermaye, bireylerin olumlu yönlerini ele alan bir kavramdır ve kişilerin başarılı olmak ve kendilerini geliştirmek için ihtiyaç duyduğu bir içsel durumu temsil eder. Bu araştırma, bireylerin proaktif kişilik özelliklerinin girişimcilik eğilimleri üzerindeki etkilerini inceleyerek, psikolojik sermayenin bu ilişkideki aracılık rolünü analiz etmektedir. Çalışmada, 78 yetişkin bireyin proaktif kişilik özellikleri, psikolojik sermaye düzeyleri ve girişimcilik eğilimleri ölçülmüştür. Elde edilen veriler, Smart PLS 4 programı kullanılarak analiz edilmiştir. Sonuçlar, proaktif kişiliğin psikolojik sermaye üzerinde anlamlı bir etkisi olduğunu ($\beta=0,918$; $p<0,05$) ve psikolojik sermayenin değişimlerinin %84,3'ünü ($R^2=0,843$; $p<0,05$) açıkladığını göstermiştir. Ayrıca, proaktif kişiliğin girişimcilik eğilimi üzerinde anlamlı bir etkisi ($\beta=0,340$; $p<0,05$) ve psikolojik sermayenin girişimcilik eğilimi üzerinde etkisi olduğunu ($\beta=0,448$; $p<0,05$) tespit edilmiştir. Her iki değişkenin girişimcilik üzerindeki etkisi toplam değişimlerin %59,5'ini ($R^2=0,595$; $p<0,05$) açıklamaktadır. Ayrıca, proaktif kişiliğin girişimcilik eğilimi üzerindeki etkisinde, psikolojik sermayenin dolaylı etkisinin de anlamlı olduğu saptanmıştır. Bulgular, proaktif kişilik özelliklerine sahip bireylerin daha yüksek bir girişimcilik eğilimine sahip olduğunu, aynı zamanda yüksek psikolojik sermayeye sahip bireylerin bu etkiyi daha da güçlendirdiğini göstermektedir. Bununla birlikte girişimcilik potansiyelini değerlendiren programların ve politikaların geliştirilmesinde proaktif kişilik özelliklerine ve psikolojik sermayeye odaklanmanın önemini vurgulamaktadır.

ANAHTAR KELİMELE: Girişimcilik Eğilimi, Proaktif Kişilik, Psikolojik Sermaye.

AUTONOMIC NERVOUS SYSTEM ACTIVITY AND RECOVERY AFTER AN OLYMPIC TRIATHLON RACE: A CASE STUDY

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ABSTRACT

Recovery in sports refers to the restoration of the organism to its initial state. It is a crucial physiological process monitored to prescribe training frequency and load, and to reduce the risk of overtraining, particularly in endurance sports like triathlon. The aim of this study was to examine the recovery process through autonomic nervous system activity in a 43-year-old male athlete following a triathlon race.

Resting heart rate variability (HRV) data was collected for seven minutes immediately after waking up in the morning over eleven days, including five days pre-triathlon race, the race day (represented as t_0) and five days post-race (represented as t_1 - t_5) in this study. The collected data was evaluated in the time domain, including mean R-R interval (meanRR), rMSSD and pNN50. Baseline values (represented as t_{baseline}) were calculated by averaging the data collected prior to the race. No differences were observed between t_{baseline} and t_0 for any of the three parameters. The values for meanRR, rMSSD and pNN50 reduced from t_{baseline} to t_1 by 6%, 26%, and 46%, respectively. Additionally, there was a substantial increase observed in the HRV parameters from t_1 to t_2 , with an increase of meanRR of 11%, rMSSD of 48%, and pNN50 of 137%. Furthermore, these values were even higher than those seen at t_{baseline} , with an increase of meanRR of 4.4%, rMSSD of 9%, and pNN50 of 25%. On the third post-race day, meanRR remained unchanged between t_{baseline} and t_3 . However, there was still an increase observed in rMSSD and pNN50 by 8% and 23%, respectively.

Within the first 24 hours after an exhaustive triathlon race, it can be said that parasympathetic activation has not yet fully begun, indicating that the recovery process is in its initial phase. Conversely, the occurrence of parasympathetic overshoot on the second day after the race serves as evidence that the recovery process has been fully activated. In conclusion, changes in autonomic nervous system activation can be useful indicators for tracking the progress of recovery after an exhaustive triathlon race.

KEYWORDS: Triathlon, Recovery, Autonomic Nervous System.

OLİMPİK TRIATLON YARIŞI SONRASI OTONOM SİNİR SİSTEMİ AKTİVİTESİ VE TOPARLANMA: BİR VAKA ÇALIŞMASI

ÖZET

Sporda toparlanma organizmanın başlangıç durumuna dönmesi olarak tanımlanabilir. Özellikle triatlon gibi dayanıklılık branşlarında antrenman sıklığı ve yükünü belirlemek ve aynı zamanda sürantrenman riskini azaltmak için takip edilen önemli bir fizyolojik süreçtir. Bu çalışmanın amacı triatlon yarışı sonrasında 43 yaşındaki erkek bir atletin toparlanma sürecini otonom sinir sistemi aktivitesiyle incelemektir.

Çalışmada triatlon yarışı öncesi 5 gün, yarış günü (t_0) ve yarış sonrası 5 gün ($t_1 - t_5$) olmak üzere 11 gün boyunca sabah uyandıktan hemen sonra dinlenim durumu kalp atım hızı değişkenliği (KAHD) verisi 7 dakika boyunca toplandı. Veriler zaman alanında (ortalama R-R aralığı (meanRR), rMSSD, pNN50) değerlendirilmek üzere hesaplandı ve incelendi. Yarış öncesi toplanan verilerin ortalaması alınarak baz değerler ($t_{baseline}$) oluşturuldu. Her üç parametrede de $t_{baseline} - t_0$ arasında bir fark görülmedi. MeanRR, rMSSD ve pNN50 parametrelerinin $t_{baseline}$ 'den t_1 'e düştüğü gözlemlendi (sırasıyla, %6, %26, %46). Buna karşın, t_1 'den t_2 'ye KAHD parametrelerinde yüksek bir artış gözlemlendi (meanRR %11, rMSSD %48, pNN50 %137). Öyle ki bu değerler $t_{baseline}$ 'a göre dahi yüksekti (meanRR %4.4, rMSSD %9, pNN50 %25). Yarış sonrası 3.günde, $t_{baseline} - t_3$ arasında meanRR değeri değişmezken, rMSSD ve pNN50'de artış gözlemlendi (sırasıyla, %8 ve %23).

Tüketici bir triatlon yarışı sonrasında ilk 24 saatte parasempatik aktivasyonun henüz tam olarak başlamadığı söylenebilir, bu da toparlanma sürecinin başlangıç aşamasında olduğunu göstermektedir. Bunun yanında, yarış sonrası 2. günde gözlenen parasempatik aktivasyondaki yüksek artış toparlanma sürecinin tam olarak aktif olduğunun kanıtıdır. Sonuç olarak, otonom sinir sistemi aktivasyonundaki değişiklikler, tüketici bir triatlon yarışından sonra toparlanma sürecini izlemek için faydalı göstergeler olabilir.

ANAHTAR KELİMELEER: Triatlon, Toparlanma, Otonom Sinir Sistemi.

**THE EFFECT OF REPOSITIONING FREQUENCY DETERMINED ACCORDING TO
BODY MASS INDEX ON PRESSURE INJURY DEVELOPMENT TIME:
RANDOMIZED CONTROLLED TRIAL**

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ABSTRACT

This study was carried out to determine the effect of repositioning frequency determined according to body mass index on the development of pressure injuries.

The research was completed with 71 patients in a university hospital, between July 2022 and January 2023, in Experimental-Randomized Control. Data were collected with a questionnaire prepared. Data are descriptive statistics, demographic quantitative data for comparisons between groups Mann Whitney U, Pearson Chi-square, Fisher exact probability test, chi-square test for relationship between categorical variables, Kaplan Meier-Survival Time analyzes for pressure injury development time, for repeated measurements non-parametric Brunner Langer (F1LDF1model) method analyzes were used.

Intervention and control groups are homogeneously distributed. Pressure injuries developed 2.70% in the intervention group and 14.70% of in the control group, the difference between them was not statistically significant($p=0.098$). Injury development time was 16 days in the intervention group and 6.00 ± 2.0 days in the control group (earliest 3rd day, latest 8th day), the difference between them was not statistically significant($p=0.137$). Pressure injury developed in one underweight, one normal weight, and three obese patient in the control group and one obese patient in the intervention group, the difference between them was statistically significant ($p=0.006$). The risk of pressure injury development is higher in underweight and obese patients, and less in overweight patients.

Pressure injuries developed in the gluteal area and sacrum in the patient in the intervention group, and in the sacrum in 8.8% of the patients in the control group, there was no statistically significant difference between them($p=0.143$).

It was concluded that the frequency of position changes should be done with a personalized program for each patient, and the risk of pressure injury development is higher in low-weight and obese patients, while it is less in overweight patients.

KEYWORDS: Body Mass Index, Moving and Lifting Patient, Nursing Care, Pressure Ulcer.

TREATMENT OF GINGIVAL OVERGROWTH IN A PATIENT WITH CELIAC DISEASE: A CASE REPORT GINGIVAL OVERGROWTH IN CELIAC DISEASE

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ABSTRACT

Celiac Disease (CD) presents a wide variety of clinical signs and symptoms, including oral manifestations. The most reported oral manifestations were recurrent aphthous stomatitis, delayed dental eruption, atrophic glossitis or geographic tongue, dental caries, dental enamel defects and xerostomia/salivary abnormalities. However, data about the other oral manifestations of CD, such as angular cheilitis, atrophic glossitis, glossodynia, and **gingival overgrowth**, are scanty.

The aim of this case report was to illustrate the sometypical oral manifestations of the CD and to describe the successful treatment of this case.

A 24-year-old female was diagnosed with Celiac Disease and appropriate therapy was initiated, and it received a good clinical response, except in the oral cavity. She was referred to the periodontology clinic of the university, aphthous ulceration (mucositis), pain, halitosis, xerostomia, gingival bleeding and **gingival overgrowth** associated with CD. According to the clinical and radiographic findings, periodontal treatment was started with an initial phase of mechanical therapy; including systematic scaling and planning of all accessible root surfaces, improved oral hygiene, use of topical medications and monitored diet.

Healing was uneventful after 4 weeks at the recal visit. There was no sign of gingival hyperplasia and bleeding. The patient was followed for 6 months and no periodontal complications developed during this time.

Dentists must be aware that CD, although thought to be uncommon. Proper periodontal care for CD's patients is essential both for oral and systemic health

KEYWORDS: Celiac Disease; gluten-sensitive enteropathy; Oral manifestations, oral complications; **gingival overgrowth**.

PROGNOSTIC SIGNIFICANCE OF SOME BIOMARKERS IN PATIENTS WITH COVID-19

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ABSTRACT

At the end of the 2019, a new coronavirus infection had happened. The World Health Organization has characterized the global spread of the disease as a pandemic. The coronavirus infection, also known as COVID-19, is a potentially life-threatening infection, with a severe course progression of illness in 15%-25% and fatality in 4%-15% of cases. We decided to study a number of markers that have prognostic significance in the complex course of the disease and mortality in patients treated in intensive care units with viral pneumonia caused by SARS-CoV, respiratory failure. In 2020-2023, we used the statistical data obtained from medical history of 150 patients diagnosed with "Covid-19, pneumonia". 46.0% of patients are men, 54.0% are women. Age of patients is 25-84, height 156-183 cm, weight 55-138 kg.

Concentration of biomarkers was studied in 3 stages. Stage I: initial period of the disease; stage II: peak period of the disease; stage III – covers the recovery period. 30% of patients were in a septic condition. CRP was 165.42 ± 12.76 mg/l in stage I, comparing stage II to stage I the CRP level decreased 1.53 times ($p < 0.01$); at stage III the CRP value decreased 4.85 times ($p < 0.01$) respectively. The concentration of procalcitonin (PCT), which is the main indicator of sepsis in patients, was 11.88 ± 1.13 ng/ml in stage I, which abate 2.33 times in stage II compared to stage I ($p < 0.05$); at stage III it decreased by 18.56 times ($p < 0.05$) and is statistically significant.

We also predict Covid severity based on ferritin (FC) levels in the blood. Thus, proinflammatory cytokines involved in the development of respiratory distress in the lungs increase ferritin synthesis and accelerate the formation of toxic hydroxyl radicals. Although FC was high in stages I and II, in stage III it decreased by 2.74 times ($p < 0.01$) and was at the upper normal limit.

The concentration of IL-6, which enhances the immune response, was high in 8% of patients. Although at the first stage it was at the upper limit of normal, at the second stage it was 12.95 times ($p < 0.001$) higher, and at the third stage it decreased to the normal level, which is statistically significant.

We consider the neutrophil-lymphocyte ratio (NLR) to be an effective marker for predicting the development of COVID-19. The infection was more severe in patients with $NLR > 3.13$ and > 50 years. In addition, we used the combined MxA/CRP test to differentiate the causes of pneumonia. MxA helped diagnose viral and bacterial infections by simultaneously measuring virus-specific markers and CRP levels.

During treatment, a wide range of antibiotics (maxipen, tazorazine, Linezor), anticoagulants (Clexane), antiplatelet agents, *iv* immunoglobulin - IVIG, and vitamin therapy were used. Mortality was observed in 2% of patients. Cause of death: Septic shock. Multiple organ failure developing against the background of a cytokine storm. Disseminated intravascular coagulation syndrome.

Thus, we consider it more informative to study the concentrations of CRP, PCT, ferritin, IL-6, NLN, MxA/CRP as biomarkers in determining the degree of lung damage and severity of the disease in patients with confirmed Covid-19. We once again emphasize the prognostic significance of these markers in choosing the correct treatment regimen for patients with viral pneumonia resulting from Covid-19 infection.

Key words: biomarkers, procalcitonin, ferritin, interleukin-6, IVIG, cytokines.

INVESTIGATION OF THE MINOCYCLINE IMPACT ON THE CELL CYCLE PROGRESSION OF HUMAN MCF-7 BREAST CANCER CELLS

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ABSTRACT

Breast cancer is the most common cancer among women and one of the leading causes of death. Controlling the cell cycle machinery can be helpful in treating cancer as it prevents inappropriate cell proliferation. The semi-synthetic tetracycline antibiotics known as minocycline were developed as more active, effective, and stable tetracyclines with antitumor action. This study aimed to determine minocycline effects on the cell cycle progression of human MCF-7 cells.

Human MCF-7 cells were seeded in a 96-well plate and treated with or without minocycline (0-100 $\mu\text{g/ml}$) for 24 h. Then, cell viability was measured using the MTT assay, and the IC_{50} of the drug was measured. To evaluate the impact of minocycline on the cell cycle progression of MCF-7 cells, a flow cytometry assay was performed. A 24-hour minocycline treatment was applied to the cells, and to analyze the distribution of cells across cell cycle phases, they were stained with PI and RNase A and assessed using a BD FACSCalibur cytometer and FlowJo software.

According to the result of the MTT test, the IC_{50} value of minocycline on MCF-7 cells was 36.1 μM . Based on the flow cytometry assay results, minocycline treatment caused cells to accumulate in the Sub-G1 phase, resulting in a significant decrease in the G0/G1 phase cell population. No significant difference was observed in the S or G2/M cell populations between the control and treated groups. These findings demonstrated that minocycline significantly induces apoptosis in MCF-7 cells.

Minocycline induces apoptosis in MCF-7 cells by stimulating DNA breakage and cell death through a specific cell cycle mechanism.

KEYWORDS: Breast cancer, Cell culture, Minocycline, Cell Cycle.

**USE OF ISSR MARKERS FOR ASSESSING GENETIC DIVERSITY OF APPLE
(*MALUS X DOMESTICA*) CULTIVARS GROWING IN MOROCCO**

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ABSTRACT

Genetic diversity of 29 apple (*Malus x domestica*) cultivars collected from different regions in Morocco was investigated using inter-simple sequence repeat (ISSR) markers. 15 ISSR primers generated 177 bands of which 156 are polymorphic (86.50%). The mean value of PIC, Rp, I and H were 0.46, 4.58, 0.43 and 0.28, respectively, implying important genetic variability between the studied apple cultivars. Furthermore, the coefficient of genetic differentiation among all groups was 0.27, indicating that 27% of total genetic variability was between groups and 73% was within groups. Bayesian analysis grouped the studied cultivars into three major clusters that are not in agreement, in major part, with their geographic origin and did not show any difference between local and introduced cultivars. Also, the problem of synonyms, homonyms, and/or labeling errors appears in the studied cultivars. These results showed that the ISSR markers can be a useful tool for detecting the genetic diversity in this fruit crop.

KEYWORDS: Apple trees, Genetic diversity, ISSR markers, Polymorphism.

POWER QUALITY ENHANCEMENT USING UNIFIED POWER QUALITY CONDITIONER (UPQC) CONTROLLED BY NONLINEAR CONTROLLER

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ABSTRACT

In contemporary times, owing to significant advancements in power electronics, the utilization of non-linear loads has gained prominence. These loads draw distorted (non-sinusoidal) currents from the power supply, leading to the generation of harmonics and an increase in their injection into the power system. This article introduces the Unified Power Quality Conditioner (UPQC) for compensating voltage and current disturbances. Our comprehensive study harnesses the dual benefits of series and shunt active filters, thereby enhancing power quality. The proposed approach involves injecting harmonic currents and voltages into the system, aligning in magnitude and exhibiting inverse phases compared to the load currents and voltages. This process effectively cancels out the undesired harmonic components. The article employs a nonlinear backstepping controller for the DC bus, and simulations conducted using MATLAB/Simulink demonstrate the efficacy of the utilized controller.

KEYWORDS: Backstepping Controller, Harmonic, Power System, Power Quality, UPQC.

DEW COMPUTING IN 5G INTERNET OF MUSIC THINGS

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ABSTRACT

Dew Computing is a paradigm that extends cloud computing to the edge of the network [1]. It focuses on leveraging computing resources at the edge of the network, closer to the data source or user, to address the limitations of centralized cloud computing. The term "Dew" refers to the idea that computing resources are spread like dewdrops, bringing processing capabilities closer to where data is generated [1-2]. The Internet of Things (IoT) involves connecting physical devices and enabling them to communicate and share data. The 5G network represents the latest generation of mobile communication technology, offering higher speeds, lower latency, and increased capacity compared to previous generations [3]. The Internet of Music Things (IoMT) is a specific application of IoT in the music industry. It involves the integration of smart devices, sensors, and connectivity to enhance various aspects of music creation, distribution, and consumption. Here are some potential ways Dew Computing could be relevant in the 5G IoMT [3-4] landscape: (a) Low Latency Processing: Dew Computing can be employed to process music-related data at the edge of the network, reducing latency in music-related applications. This is particularly important in real-time applications, such as live music streaming or collaborative music creation. (b) Bandwidth Efficiency: By processing data at the edge, Dew Computing can help in filtering and compressing data before it is sent to the cloud. This can contribute to more efficient use of bandwidth, which is crucial in 5G networks. (c) Edge Analytics for Music Data: Dew Computing allows for analytics and processing of music-related data close to the data source. This could include analysing user preferences, creating personalized playlists, or providing real-time recommendations based on local data. (d) Decentralized Music Services: Dew Computing can support the decentralization of music services, allowing for distributed processing and storage of music-related data [4-5]. This can enhance reliability and reduce dependence on centralized servers. (e) Enhanced Security: Processing sensitive music data at the edge can enhance security by reducing the need to transmit sensitive information over long distances. This can be crucial in applications where privacy and data protection are paramount. We should keep in mind that the specific applications and implementations of Dew Computing in 5G IoMT may evolve over time, and it's advisable to check the latest research and industry developments for the most up-to-date information.

KEYWORDS: Internet of Music Things; Dew Computing; Edge Analytics ; Latency ; Bandwidth.

ASSESSMENT OF HORIZONTAL WELL PERFORMANCE

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ABSTRACT

Horizontal wells provide an alternative means of extracting natural gas and oil, in situations where drilling vertical wells is not feasible or does not provide enough fuel. Drilling a horizontal well involves starting at the surface and working your way down to a spot just above the intended oil or gas deposit. To reach maximum production, it is essential to anticipate the horizontal well performance precisely. The assumption of a uniform influx profile along the horizontal wellbore has led to an inappropriate well design by ignoring pressure loss in the process of determining the horizontal well flow performance. Horizontal wells have advantages over conventional wells in terms of inflow performance and production rate, particularly in thin layer reservoirs, naturally fractured reservoirs, and reservoirs with gas or water conning problems. Horizontal wells are more productive due to their larger surface area in contact with the reservoir than vertical wells. As the well length increases so does the frictional pressure loss. In most cases there is an optimal well length beyond which a productivity decline will occur. The purpose of this paper is to present a review finding on the assessment of Horizontal well performance, taking into consideration, predictions, model assumptions, length optimization, design completion and other aspects which yields performance processes. Permeability anisotropy and perforation orientation affect the design completion and perforation of a wellbore, as described by the flow pattern shown in the model optimization. A lifting design that is effective aids in achieving maximum production and the main parameters influencing output are the ratio of gas to oil (GOR), well length, horizontal permeability, and oil viscosity, all of which have an impact on the productivity of horizontal wells. A significant quantity of gas liberation can have a major impact on production, tubing lifting, and overall pressure loss in a well with a high producing gas oil ratio.

KEYWORDS: Horizontal well, Production rates, Frictional losses, Perforation, Tubing lifting, Pressure drop.

HEALTH PROMOTION STRATEGY FOR THE PURPOSE OF ESTABLISHING A HEALTHY LIFESTYLE IN GEORGIAN POPULATION

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ABSTRACT

Health promotion is the combination of strategies at individual, group and public level in order to prevent chronic diseases, change behavior, attitude and to increase the level of health education. The main burden of morbidity and mortality in the world comes from non-communicable diseases. Unhealthy lifestyle and associated risky behaviors such as tobacco use, unhealthy eating, low physical activity, and alcohol consumption are the leading causes of chronic diseases.

The research was conducted to study the awareness of the population of Georgia about a healthy lifestyle in order to develop an effective health promotion strategy.

With regards to the study methodology, descriptive, cross-sectional study was chosen. Online survey with close-ended questionnaire was used. Overall, 108 internet-service users took part in the study. The questionnaire was organized in a way to assess the following health indicators: lifestyle (eating patterns, physical activity, smoking, drugs use, emotional health and well-being).

The study revealed that in Georgia it is necessary to plan and develop preventive measures and accordingly, to create an effective health promotion strategy. Even though majority of participants have a high educational level, the rate of smoking, unhealthy diet, overweight is relatively high while, the level of physical activity is significantly low. It has to be emphasized that study revealed serious problems in terms of emotional health and well-being. The level of stress, depression, loneliness, and lack of sleep is common among study participants.

Considering the above explained circumstances, active involvement of public health organizations, state and private agencies, educational institutions is recommended in order to promote healthy lifestyle, to increase health literacy and public awareness of risks associated to obesity, smoking, risky behavior and physically inactive lifestyle.

KEYWORDS: Health promotion, Lifestyle.

EXPOSURE TO POLYCHLORINATED BIPHENYLS (PCBS) FROM FISH CONSUMPTION: EFFECTS ON HUMAN HEALTH

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ABSTRACT

Currently, fish is consumed by a large percentage of the world's population, and fish consumption per capita has risen from an average of 9.9 kg in the 1960s to 20.5 kg in 2018. Fish contain a range of nutrients that can benefit health, such as essential amino acids, omega-3 fatty acids, vitamins, and minerals. Furthermore, fish provides low fat and calories, so it is an ideal food for people who are trying to maintain a healthy weight. Therefore, incorporating fish into a balanced diet can be a healthy way to meet nutritional needs. Polychlorinated biphenyls (PCBs) are synthetic chemicals used in electrical equipment and as additives to paint, plastics, and other products. PCBs are harmful to human health and can cause adverse health effects. Human exposure to high levels of PCBs can result in increased levels of some liver enzymes, dermal lesions, respiratory problems, and increased rates of melanomas, liver cancer, gastrointestinal tract cancer, brain cancer, and breast cancer. The contamination of fish with PCBs can be caused by living near contaminated sediment or eating contaminated food. Eventually, PCBs build up in the fatty tissues of fish and can reach levels thousands of times higher than levels in the water, especially in bottom-feeding fish and predatory fish. PCB concentrations in fish and shellfish have decreased to acceptable ecological concentrations in most assessment areas. However, it is still important to limit the consumption of certain fish based on available data on PCB concentrations in fish. The Environmental Defense Fund recommends avoiding fish that are known to have high levels of PCBs, such as farmed salmon, and instead opting for fish that are low in PCBs, such as wild-caught salmon, sardines, and trout. Moreover, the skin and fat of fish should be removed before cooking because PCBs accumulate in fat.

KEYWORDS: Polychlorinated biphenyls, PCBs, Human Health, Food Safety.

ENHANCING THE IMPORTANCE OF POWER FACTOR CORRECTION BY EXPLORING SOME CONCEPTS RELATED TO STANDARDS THD AND PFC

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ABSTRACT

In alternating current power transmission and distribution, the power factor is the ratio of power to volt-amperes. In the simplest case, when the voltage and current are both sinusoidal, the power factor is equal to the cosine of the phase angle between voltage and current. A power transmission system is working at its greatest efficiency when the power factor is unity. When the power factor is less than unity, the transmission losses increase and the system capacity is reduced. Power companies therefore require customers, especially those with large loads, to maintain, within specific limits, the power factor (PF) of their respective loads or be subject to additional charges. The objective of this research paper is to enhance the importance of power factor correction (PFC) by exploring some concepts related to standards, Total Harmonic Distortion (THD) and PFC circuits and explains the technical terms of PF and a number of different PFI approaches are evaluated by providing step by step explanation.

KEYWORDS: Reactive Power, Apparent Power, Active Power, Capacitor, Power factor , Efficiency, Corrections.

PASTORALISTS' SOURCES OF INFORMATION ON CATTLE DISEASES AND PARASITES IN NORTH EAST, NIGERIA

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ABSTRACT

The study assessed pastoralists' sources of information on cattle diseases and parasites in North east, Nigeria. Multi-stage sampling procedure was used to select 420 pastoralists for the study. Frequency, percentage, mean and logit regression were used in data analysis. Family members ($\bar{x} = 3.93$) and association ($\bar{x} = 3.92$) were pastoralists' major sources of information. Coefficients of community meetings (0.0008), extension workers (0.0033) and friends (0.0042) were significant at 5%. The study recommends that, livestock extension and other development information should be disseminated through pastoralists' associations /organization such as Pulaku kautal hore and Miyetti Allah Cattle Breeders' Association of Nigeria.

KEY WORD: Cattle Diseases and parasites, Pastoralists, North east, source.

INTRODUCTION

Information and communication are essential ingredients needed for the effective transfer of technologies that are designed to boost agricultural production. For farmers to benefit from such information they must first have access to them and learn how to effectively utilise them in their farming systems and practices which should be the function of agricultural extension agencies all over the world. These extension agencies make use of different approaches, such as in transferring improved agricultural technologies to the end users. (Bashir *et al.*, 2020).

According to reports by the Federal Ministry of Agriculture and Rural Development (FMARD, 2018), Nigeria has a cattle population of 19.5 million herds which comprises 1.47 million milking cows, 13.26 million beef cattle as well as 4.77 million for both dairy and beef products (Kubkomawa, 2017). Furthermore, among the cattle population 15.3 million breeds are indigenous to Nigeria which includes the White Fulani, Red Bororo, Sokoto Gudali, Adamawa Gudali, Wadara, Azawak, Muturu, Keteku, Ndama and Kuri (Hassan, 2017). Pastoralists are people who herd animals to sustain their livelihood, they usually migrate from one geographical location to another on seasonal basis in search for greener pasture such as water and grasses to feed their livestock. Pastoralists in north east Nigeria get only limited access to information on both modern and traditional management practices of cattle diseases and parasites (Bashir, 2022). Probably as a result of their level of education, farmers-headers conflict, frequent mobility which may make access by extension service difficult. Cattle diseases and parasites cause reduction in the growth performance, market value and sometimes death of the cattle if not properly managed and controlled. Similarly, zoonotic diseases and parasites such as Tuberculosis, Anthrax, Brucellosis,

and foot and mouth disease among other diseases could affect both the pastoralists and the general public through the consumption of not well handled and processed products of cattle such as meat and milk from the affected animals. There was much imperical study conducted by researcher particularly with regard to sources of information on cattle diseases and parasites To Bridging these gaps reinforces the need to investigate pastoralists' sources of information on cattle diseases and parasites in north east, Nigeria.

Methodology

The study was carried out in North East Nigeria. The region comprises of Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe States. It lies between latitude $6^{\circ}26^1$ and $13^{\circ}45^1$ N and Longitude $8^{\circ}42^1$ and $14^{\circ}39^1$ E (Bashir, 2022). North East Nigeria was created from the Northern region on the 27th of May 1967 and covers close to one-third ($280,419\text{km}^2$) of Nigeria's land area ($909,890\text{km}^2$) with a population of 18,984,299 people that is 13.5% of the country's population (NPC, 2006). The National Population Commission projected an annual growth rate of 13.6% which brought the population figure to 32,137,094 as at 2020. (NBS,2017).

The Population of the study consists of all pastoralists in the study area. Five stage sampling procedure was employed for the study. Stage one: purposive selection of Four (4) states of Adamawa, Bauchi, Gombe and Taraba. This is due to the fact that incessant attacks and insecurity is minimal in these four states. Stage two: purposive selection of six local government areas from Adamawa (Tungo, Yola south, Jada, Ganye, Mayo-Belwa and Mubi) five from Bauchi (Alkaleri, Soro, Darazo, Katagum and Gamawa) four from Gombe (Gombe, Balanga Funakaye and Akko) and five from Taraba (Wukari, Gassol, Ardo-Kola and Gashaka) respectively. In all 20 local government areas with supportive vegetation for cattle rearing were selected for the study. Stage three: purposive selection of one community each that was mostly resided by pastoralists from the 20 local government areas selected for the study that is 20 communities were selected (Toungo ,Ngurore, kojoli, Ganye Mayo-Belwa, in Adamawa State, Alkaleri, Soro, Darazo ,Katagum ,Gamawa, in Bauch state. Gombe, Balanga Funakaye Akko in Gombe State while Wukari, Gassol, Ardo-Kola Bali and Gashaka in Taraba state respectively.

Stage four: : Snow ball technique was employed to select pastoralists for the study as the exact populations of the pastoralists in the communities were unknown. Stage five: 21 pastoralists were selected per community using a snowball technique, in all 420 pastoralists were involved in the study. However only 417 questionnaires were finally analysed as three questionnaires could not be accounted for. The data were collected with the aid of structured interview schedule. to the pastoralists. Frequency, percentage, mean and standard deviation were used to analyze the objective of the study while multinomial logit regression model was used to test the hypotheses of the study.

The regression model is explicitly specified as:

$$P = \exp \frac{(b_0 + b_1X_1 + b_2X_2 \dots \dots + b_pX_p)}{1 + \exp(b_0 + b_1X_1 + b_2X_2 + \dots + b_pX_p)}$$

P = management practices of cattle diseases and parasites such as Vaccination, use of herbs, deworming and smoked (Dependent variable)

X₁-X₁₃= Sources of information (Independent Variables).

- X₁ = Association/Organization
- X₂ = Books
- X₃ = Community meetings
- X₄ = Cattle markets
- X₅ = Access to Extension Services
- X₆ = Family members
- X₇ = Friends
- X₈ = Magazines
- X₉ = Mobile phones
- X₁₀ = Radio
- X₁₁ = Traditional Leader
- X₁₂ = Town Criers
- X₁₃ = Television

RESULTS AND DISCUSSION

Pastoralists Sources of Information on Cattle Diseases and Parasites

Result in Table 1 reveals out of ten items listed pastoralists sources of information on cattle diseases and parasites management, family member($\bar{x} = 2.93$), association/organization($\bar{x} = 2.92$) and friends($\bar{x} = 2.62$) were the major sources of information used by pastoralist in the study area. This implies pastoralist are usually migrating from one geographical location to another. They will have access to more information from different sources such as family members and friends who are relatively closer to them. The findings relate to the study of Brhane *et al.* (2017) and Mosha, *et al.* (2018), who reported that relatives and friends were the major sources of information among pastoralist as a result of farmers-herder clashes that could not permit extension agents to access the pastoralists at different location.

Table 1: Distribution of pastoralists based on sources of information on cattle diseases and parasites

S/N	Sources of information	Yes	Very Common	Common	Not Common	Mean (\bar{X})	STD
i.	Family members	417(100)	386(2.78)	31(0.15)	0.00	2.93	1.7
ii.	Association/Organization	397(95.2)	303(2.29)	37(0.19)	57(0.14)	2.62	1.6
iii.	Friends	325(99.3)	269(2.48)	56(0.34)	33(0.10)	2.92	1.7
iv.	Traditional leaders	414(99.2)	303(3.1)	51(0.25)	70(0.17)	2.54	1.6
v.	Radio	399(95.7)	264(1.98)	47(0.24)	88(0.22)	2.44	1.6
vi.	Community meeting	198(47..5)	105(1.59)	43(0.43)	50(0.25)	2.25	1.5
vii.	Cattle Markets	374(89.7)	185(1.48)	87(0.47)	102(0.27)	2.22	1.5
viii.	Mobile phones	397(95.2)	203(1.52)	79(0.39)	115(0.29)	2.21	1.5
ix.	Extension agents	145(34.7)	83(1.07)	8(0.11)	54(0.37)	2.20	1.5
x.	Town crier announcement	208(49.9)	75(1.08)	32(0.31)	101(0.49)	1.88	1.4

Source: Field Survey, 2021

Testing hypothesis

The result of the analysis presented in Table 2 showed that the coefficient of extension agent (0.0033) and friends (0.0042) were found to be positive and statistically significant at 5% levels, while community meetings (0.0008) were found to be negatively and statistically at 5%. This implies that pastoralists access to information through extension agents, friends and community meetings as well as could also result to increase on the pastoralists access to source of information on cattle diseases and parasites while lack of attending community meetings could also affect their access to information on cattle diseases and parasites management. Pastoralists' shares information among themselves during such a gathering. It could be deduced that more contact with extension agents and friends could results to the increase in pastoralists access to information that could also result to increase the pastoralists' chances of acquiring more information on cattle diseases and parasites. This is in agreement with Colledani *et al.* (2016) who reported extension agents, friends and cooperatives increases pastoralists access to information.

Table 2: Logit regression analysis of relationship between pastoralists sources of information and management practices of cattle diseases and parasites

Variables	Regression Coefficient	Standard error	Z-statistics	Prob.
X ₁ (Association/Organization)	0.871868	0.742986	1.769240	0.0769 ^{NS}
X ₂ (Books)	0.374233	0.681026	-1.422464	0.1549 ^{NS}
X ₃ (Community meetings)	0.342234	0.761828	-3.362206	0.0008*
X ₄ (Cattle markets)	0.052532	0.622019	-1.878231	0.0603 ^{NS}
X ₅ (Extension agents)	0.898680	0.705956	2.938265	0.0033*
X ₆ (Family members)	0.643870	1.212913	-0.431677	0.0660 ^{NS}
X ₇ (Friends)	0.833583	0.577971	2.861767	0.0042*
X ₈ (Magazines)	0.961541	0.582839	1.506331	0.1320 ^{NS}
X ₉ (Mobile phones)	0.826624	0.582586	0.970323	0.3319 ^{NS}
X ₁₀ (Radio)	0.733803	0.551128	-0.318363	0.7502 ^{NS}
X ₁₁ (Traditional Leader)	0.853422	0.551430	1.728623	0.0839 ^{NS}
X ₁₂ (Town Criers)	0.846481	0.735849	1.141181	0.2538 ^{NS}
X ₁₃ (Television)	0.812103	0.721766	0.556011	0.5782 ^{NS}
C	1.188693	1.204553	0.986833	0.3237
R-square	0.315880			
5% level of significance *				
NS - Not significant				

Source: Field Survey Data, 2021

Conclusion and Recommendations

Based on the findings the study concluded pastoralists if not all, majority of the pastoralists access information from family and their Association. On the basis of the major findings, it was recommended that, livestock extension and other development information should be disseminated through respondents' associations /organization such as Pulaku kautal hore and Miyetti Allah Cattle Breeders' Association of Nigeria.

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POLITICAL POLARIZATION AND ITS IMPACT ON DEMOCRACY

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ABSTRACT

Political polarization refers to the widening divide between political groups or parties, characterized by increasingly divergent ideological beliefs and policy positions. A deepening sense of hatred, mistrust, and hostility between these groups often accompanies it. Political polarization has gained significant attention in recent years due to its potential impact on democratic systems. One aspect of political polarization is ideological divisions. As political parties and groups become more ideologically distinct, there is a tendency for individuals to align themselves with like-minded individuals and consume news and information that reinforces their existing beliefs. This "echo chamber" effect can further entrench partisan divisions and hinder constructive dialogue and compromise.

The causes of political polarization are multifaceted and can vary across different contexts. Factors such as socioeconomic inequality, cultural and identity issues, media fragmentation, and the influence of interest groups all contribute to the polarization of political discourse. Additionally, social media and online platforms have played a significant role in exacerbating polarization by enabling the spread of misinformation and facilitating echo chambers. The impact of political polarization on democratic systems is concerning. One consequence is the erosion of trust in democratic institutions. When political parties and leaders engage in extreme rhetoric and partisan gridlock, citizens may lose faith in the ability of democratic systems to effectively address societal challenges. This can lead to apathy, disengagement, and a decline in voter turnout.

Moreover, political polarization can give rise to populism and the rise of fringe or extremist political movements. By exploiting the divisions and frustrations within society, populist leaders often gain support by offering simple solutions to complex issues. This can further polarize public opinion and undermine democratic norms, such as respect for minority rights and the rule of law. The effects of political polarization are also felt in the policymaking process. The inability to find common ground and negotiate compromises can lead to legislative gridlock and hinder the enactment of effective policies. This can impede progress on critical issues such as economic reforms, social welfare, and environmental protection.

Addressing political polarization requires a multi-faceted approach. It involves promoting constructive dialogue, fostering empathy and understanding between opposing groups, and encouraging a more inclusive and diverse political discourse. Additionally, efforts to reduce the influence of money in politics, improve media literacy, and enhance civic education can contribute to mitigating polarization.

Ultimately, the goal is to create a democratic system that values pluralism, embraces diverse perspectives, and encourages collaboration and compromise. By addressing political polarization, societies can work towards strengthening democratic governance and ensuring the effective representation of all citizens.

KEYWORDS: Mistrust, Hostility, Echo-chamber, Inequality, Disengagement, Environmental protection.

EFFICIENT NANOCOMPOSITES WITH SUNLIGHT RESPONSIVENESS (GCN/BC/AW) FOR THE PHOTOCATALYTIC REMOVAL OF DYE COMPOUNDS

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ABSTRACT

In this paper, we synthesize by coprecipitation a recoverable photocatalyst gCN/BC/ AW nanocomposites, as a greatly effective visible-light-active photocatalyst, and they were characterized by XRD, EDX, SEM, UV – vis, and FT- IR analysis. Sun-light-convicted photocatalytic performances were studied by the degradation of MG dye as a pollutant. It was verified that the nanocomposites are effective in the reduction of e^-/h^+ recombination via the matched relations between energy bands of gCN, BC, and AW semiconductors. The loftiest photocatalytic declination effectiveness was observed for the gCN/ BC/ AW nanocomposite after 1h of radiation by more than 96% degradation of MG, more than every semiconductor independently.

In addition, a mechanism for photocatalytic performances was proposed using reactive species scavenging trials and characterization results.

KEYWORDS: nanocomposite photocatalyst; coprecipitation; degradation.

MILITARY AND INTERNAL SECURITY OPERATIONS IN THE NORTH CENTRAL ZONE OF NIGERIA

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ABSTRACT

This term paper explores the intricate dynamics surrounding military and internal security operations in Nigeria's North Central Zone. The study examines the factors influencing the success or failure of these operations, the concept of internal security, the effectiveness of security operations, and their impact on socio-economic and political stability. Through an in-depth analysis of existing literature, empirical evidence, and theoretical frameworks, the study identifies key findings that underscore the multifaceted nature of security interventions in the region. The research reveals that the effectiveness of military operations is influenced by a confluence of factors, including political support, intelligence sharing, resource allocation, community engagement, and adherence to human rights principles. These factors impact the outcomes of operations and highlight the interconnectedness between security, socio-economic conditions, and political stability. The study emphasizes the need for a holistic approach that balances security objectives with wider implications for communities and governance. The study's findings yield recommendations for policymakers and security agencies, advocating for a comprehensive strategy that encompasses community-centered approaches, resource allocation, interagency collaboration, and adherence to human rights standards. By integrating these recommendations into security policies and operational practices, stakeholders can foster lasting stability, mitigate socio-economic disruptions, and ensure the well-being of the North Central Zone's populace.

KEYWORDS: North Central Zone, Nigeria, military operations, internal security.

SOCIODISCURSIVE REPRESENTATIONS IN THE DEBATE OF THE BILL OF HISTORIC REPARATION FOR TRANVESTITES AND TRANS ELDERLY PEOPLE IN ARGENTINA

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ABSTRACT

This paper aims as a general objective to analyze the sociodiscursive representations arising in the legislative debate of the bill of historic reparation for transvestites and trans elderly people in Argentina as tools of recognition from the creation of the Pension Reparatoria for Elderly Transvestites and Trans of which would be possible beneficiaries.

In the global south, and specifically in Latin America, the experiences, demands, and interests of the transvestite, transformist population have been articulated in the public sphere through various strategies in the last thirty years, from the negotiation of figures of suffering and unprotection, through gadgets of celebration and scandal, and finally reaching the politicization of street life, sex work, and the affirmation of gender-generic dissent.

In Argentina, eleven years after the adoption of Law 26,743 establishing the right to gender identity of persons, various transvestite and trans activist groups demand a Law of Historical Reparation as a way of compensatory compensation that would seek to repair the damage caused by institutional violence suffered by this group for attacking their gender identity and the violation of their human rights. The analysis of socio-discursive representations in the discursive treatment of this bill in the Chamber of Deputies is of great importance to distinguish and study tools against discrimination, the processes of impoverishment of transvestites and trans people and the recognition of rights.

The analysis of the legislative speeches that took place on May 24, 2023. It seeks to deepen the evolution of the resignifications of the recognition of the rights of this group with the possibility of the granting of a life-long reparation pension.

KEYWORDS: Public policies, LGTBIQ+ rights, social protection, sociodiscursive representations.

BIOCHAR APPLICATION TO ENHANCE PLANT GROWTH, MITIGATE HEAVY METALS POLLUTION, AND REDUCE METHANE EMISSIONS: A COMPREHENSIVE REVIEW

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ABSTRACT

The global rise in population and urbanization has escalated heavy metals pollution and greenhouse gas emissions, particularly methane (CH₄), prompting a call for sustainable agricultural practices. Biochar, a carbonaceous material produced through organic matter pyrolysis, offers a promising solution. This review synthesizes current knowledge on biochar's application in agricultural systems to enhance plant growth, remediate heavy metals pollution, and reduce methane emissions. Biochar's production and properties, such as high surface area, porosity, and stable carbon content, make it an ideal soil amendment. It enhances soil fertility by improving soil structure, nutrient retention, and microbial activity. Mechanisms supporting plant growth include increased nutrient availability, enhanced water retention, and stimulation of beneficial microbial communities. Heavy metals pollution, largely a result of industrial activities and improper waste disposal, can be mitigated by biochar. Biochar's adsorption and immobilization properties sequester heavy metals, reducing their bioavailability and preventing plant uptake. Additionally, biochar aids in the restoration of contaminated sites and long-term soil remediation. Methane emissions, a potent greenhouse gas, contribute significantly to global warming. Biochar has been studied as a novel approach to mitigate methane emissions from rice paddies and wetlands by inhibiting methanogenic archaea and promoting methanotrophic bacteria. Despite its potential, challenges such as heterogeneous properties, feedstock variability, and volatile organic compound release should be considered, emphasizing the need for site-specific approaches and ongoing research to optimize biochar application. In conclusion, biochar presents a multifaceted solution to address pressing environmental challenges in agriculture. Its capacity to enhance plant growth, remediate heavy metals pollution, and reduce methane emissions underscores its potential as a sustainable and environmentally friendly soil amendment. This review highlights the importance of continued research and development to harness biochar's full potential for promoting sustainable agriculture and mitigating environmental degradation.

KEYWORDS: Biochar, Plant growth enhancement, Heavy metals pollution, Methane emissions, Soil fertility, Soil remediation, Environmental sustainability, Soil health, Contaminated soils.

**THE DEPARTMENT OF ENERGY'S TRAINING AND DEVELOPMENT
PRACTICES: A PROSPECT FOR ENHANCED HUMAN RESOURCE
DEVELOPMENT AGENDA**

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ABSTRACT

This study examines the training and development practices of the Department of Energy (DOE), their impact on employee performance and productivity, and areas that need improvement to provide evidence-based recommendations for enhancing its Human Resource Development Plan.

This study employed quantitative research design to assess the training and development practices of the DOE as perceived by its employees. It highlights the importance of continuous improvement in training and development practices to foster employee growth and development, ultimately enhancing overall organizational productivity. The findings have significant implications for the DOE's human resource development agenda, suggesting a path towards a consistent, enhanced, and holistic approach to employee development and organizational performance.

Based on the findings, it can be said that the DOE recognizes the importance of providing effective training and development opportunities for its employees. However, there are several areas that need improvement to ensure that the training programs meet the needs of the employees and the organization as a whole. An action plan is proposed outlining the steps that the DOE can undertake to enhance its training and development program and policy to improve employee satisfaction, increase participation in training programs, and provide employees with opportunities for career growth based on the assessment of the employee-respondents of the study. Specifically, the proposed action plan intends to address the following: 1) Design and implementation of comprehensive training programs; 2) Continuous improvement of training and development practices; 3) Investment in training and development to enhance employee performance; 4) Regular evaluation of training and development programs; and 5) Explore other factors influencing employee performance and productivity.

KEYWORDS: training and development, human resource development, employee performance, organizational performance.

MEMA -MEDICAL EMERGENCY AND MANAGEMENT APPLICATION

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ABSTRACT

Many road accidents occur nowadays as a result of increased traffic or rash driving on highways. In many cases, family members or ambulance authorities are not notified in a timely manner. This causes a delay in providing medical assistance to the victim, which can be fatal at times. The primary goal of our paper 'Ambulance Tracking and Accident Notification System' is to prevent such blunders. The vehicle tracking system protects all vehicles by continuously tracking them, whereas accident notification saves people who have been in an accident by detecting accidents with the help of various sensors. Both systems improve vehicle security and prevent death due to delayed treatment by utilizing the Global Positioning System

KEYWORDS: GSM, GPS, GPRS, accelerometer, smoke sensor, shock sensor.

VIRTUAL VOICE ASSISTANT MAX

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ABSTRACT

An AI Assistant, also called AI Virtual Assistant or digital assistant, is an application program. It understands natural language voice commands and completes tasks for the users. This is a private assistant for individual users. The Artificial Intelligence Virtual Assistant uses advanced Artificial Intelligence (AI), RPA, natural language processing, and machine learning to extract information and complex data from conversations to understand and process them accordingly. Some virtual assistants are equipped to comprehend spoken language and answer with synthetic voices. Users can use voice commands to manage other basic chores like email, to-do lists, and calendars in addition to asking their assistants questions, controlling home automation devices, and controlling media playing and other day-to-day activities. These virtual assistants are becoming part of human life these days

KEYWORDS: Artificial Intelligence (AI), RPA, natural language processing, and machine learning.

CQDs@NiO: AN EFFICIENT TOOL FOR METHANE SENSING**Marilena Carbone**

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ORCID ID: <https://orcid.org/0000-0000-0000-0000>**ABSTRACT**

Methane gas is extensively employed as fuel in houses and industries, and as a propellant for automotive vehicles. As a chemical raw material, it also finds application in the production of carbon black, acetylene, carbon disulfide, and methanol, among others. CH₄ is the main gas component in coal mines, and it is extremely dangerous, since it easily explodes when it reaches a volume concentration between 4.9% and 15.4% in air. Because of the odorless and flammable nature of this asphyxiant gas, the development of sensitive detectors for real-time detection at concentrations lower than its explosive limit is in pressing need. In this framework, a composite material based on carbon quantum dots (CQDs) and NiO was prepared and tested for methane sensing. The synthesis procedure is simple and foresees the preparation of the CQDs by citric acid pyrolysis and NiO by hydrothermal synthesis. A phase sonication and stirring procedure yielded the composite CQDs@NiO at different loads. The composites were characterized by X-ray diffraction, ultraviolet–visible light (UV–Vis) spectroscopy, SEM microscopy, energy-dispersive spectroscopy (EDS) mapping, and surface area, porosity, and impedance measurements. A gas sensor was built in-house and used to probe the response of the synthesized samples to CH₄ detection, at constant environmental humidity. The CQDs@NiO at 1% weight load displayed excellent performances in terms of gas response both vs. temperature and vs. concentration, whereas higher loads resulted in CQD aggregation and diminished output. Response/recovery times of the 1%CQDs@NiO sample were good, as well as the selectivity and the stability over time and for variable environmental humidity. The estimated limit of detection was 0.1 ppm.

KEYWORDS: NiO, CQDs, hydrothermal synthesis, gas sensor, methane, LOD.

STOCK PRICE PREDICTION USING MACHINE LEARNING

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ABSTRACT

In today's economy, there is a profound impact of the stock market or equity market. Stock market prediction is an act of trying to determine the future value of a stock other financial instrument traded on a financial exchange. Prediction of stock prices is extremely complex, chaotic, and the presence of a dynamic environment makes it a even Stock market prediction is an act of trying to determine the future value of a stock other financial instrument traded on a financial exchange challenging.

Stock prices are correlated within the nature of market; hence it will be difficult to predict the costs. Recently, many researchers have implemented several machine learning approaches to forecast the future stock market prices more accurately and precisely. Behavioural finance suggests that decision-making process of investors is, to a very great extent influenced by the emotions and sentiments in response to a particular news.

Thus, to support the decisions of the investors we have more apps which contains features like full-day coverage of news related to markets, easy portfolio management, daily updates, advanced technical charting etc..... In addition to those existing features, we would like to present an approach for some additional ones.

1. Calculating instant profit and loss
2. Enhancing the alerting system configuration via suggesting related video.

KEYWORDS: Machine learning, Prediction, Local language, Alerting system configurations.

KWAME NKRUMAH'S CONTINENTAL VISION FOR THE UNIFICATION OF AFRICA

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ABSTRACT

The present study examines Kwame Nkrumah's Pan-African vision for the unification of Africa. My purpose is to show Nkrumah's socio-economic and political projects for the unification of the entire continent. Through an historical perspective, the study agrees that Nkrumah played a significant role through reflexion and action, theory and practice with his passionate Pan-African vision, because he organized many conferences across Africa in order to let the people understand his vision. So, Nkrumah wanted to link Africa with roads, railways, waterways and air-lines, as well as to improve the standard of living of Africans, abolish disease, poverty, illiteracy, frontier troubles between Africans and expand the provision of education. He also wanted the Africans to co-operate in educational schemes and to adopt common standards. The study also reveals that Nkrumah envisaged a Union Government of African States (or the United States of Africa). His socio-economic and political projects for the unification of Africa consisted of the following common processes and institutions: Continental Economic Planning leading to the creation of an African Common Market; a Common Currency, a Monetary Zone, and a Central Bank of Issue; a Foreign Policy and Diplomacy; a Continental Parliament and Constitution; a Federal President and Government. Including a Continental Communication System. In 1960, when Nkrumah became the President of the Gold Coast (now Ghana), he succeeded to implement his vision, especially his political project for the unification of Africa for a few moments in the case of Ghana-Guinea-Union and Ghana-Guinea-Mali-Union and later on his dream failed.

KEYWORDS: Nkrumah, Vision, Unification, Project, African-unity, Union-Government.

GENES GOVERNING COAT COLOUR CHARACTERISTICS FOR IMPARTING CLIMATE RESILIENT POTENTIAL IN GOATS

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ABSTRACT

Goats play a crucial role in various aspects of human life and their importance extends across different domains including agriculture, economy, nutrition and sustainable development. Goats are known for their resilience and adaptability to a variety of climate, making them valuable livestock in diverse environmental conditions. Coat colour is one of the important morphological traits which imparts adaptive ability to heat stressed animals. Animals with light/white coloured coats have an advantage in tropical regions, because the coat reflects 50–60% of direct solar radiation, in contrast to dark-coloured animals. Coat colour characteristics in goats are primarily determined by combination of genes that control the production and distribution of pigments. The main pigments responsible for coat colour are eumelanin (black or brown) and pheomelanin (red or yellow pigment). For example, Agouti Signaling Protein (ASIP) gene which regulates the distribution of pigments, influencing the banding of colours along the hair shaft. Other genes include Melanocortin-1 receptor (MC1R) gene, Extension(E) gene, Pheomelanin (Red) colour gene, Premelanosome protein (PMEL), Tyrosinase (TYR) gene, KIT gene, KITLG (KIT Ligand), ASIP locus variants. It's important to note that the influence of coat colour in goats follows a complex pattern involving multiple genes and alleles. The study of goat coat colour genetics is an active area of research, and ongoing discoveries continue to refine our understanding of the specific genes and mechanism involved in determining the coat colour. Understanding the interaction between genetic factors and environmental conditions is essential for developing sustainable breeding programs aimed at improving the adaptability of goat population to different climate.

KEYWORDS: Climate resilience, Coat colour, Genes, Goat, Pigment.

ANTIOXIDANT SUPPLEMENTATION TO RELIEVE HEAT STRESS IN SHEEP

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ABSTRACT

Sheep rearing is considered as one of the primary livelihood option for the small scale livestock farmers especially in dry and semi-arid areas. Several research reports documented an increase in the prevalence of heat stress in sheep and recorded the negative impacts such as reduced feed intake, decreased weight gain, fall in conception rate and impacted animal health.

This warrants more research efforts towards increasing the productive and reproductive performance of sheep by utilizing cost-effective methods. Sheep subjected to heat stress suffers with oxidative stress due to more production of reactive oxygen species (ROS). Thus supplementing antioxidants could be a reliable strategy to reverse the impact of heat stress on sheep production. Studies have shown that utilizing antioxidants as feed supplements improved the oxidative status and reduced the negative effects of heat stress in sheep. Supplementation of

Vitamin E and C, selenium and plant tannin in the diet of sheep at supranutritional level has protected the body's defense system against excessively produced ROS and free-radicals during heat stress. The positive impacts of antioxidant supplementation includes the increase in the growth rate of lambs, live weight, carcass weight and fleece production; improves the carcass characteristics, meat quality, oxidative stability and shelf life, reproductive performance of the ewes and blood-serum anti-oxidant capacity; decreases the oxidative stress index by 30% and the levels of malondialdehyde, cortisol and HSP-70. Thus, utilizing antioxidants as feed supplements is considered as the most economical and strategic method to alleviate heat stress and improve adaptation, production and reproductive performance in sheep.

KEYWORDS: Anti-oxidants, Adaptation, Free-Radicals, HSP-70, Selenium.

CLASSICAL HEAT SHOCK PROTEINS DETERMINING THERMO-TOLERANCE IN SHEEP

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ABSTRACT

Sheep rearing is a profitable venture among small and marginal-scale farmers with minimum initial investment across the globe. It is raised mainly for wool, meat, milk, and hides. However, global warming and climate change create havoc resulting in ill effects on the growth and productive aspects of the animal. The phenotypic markers have been assessed to identify and mitigate the induced effect of heat stress. Strategies to identify the thermo-tolerant and climate-resilient genes have gained momentum under the changing climate scenario. The Heat Shock Proteins (HSPs) are ubiquitous families of proteins responsible for chaperone-like activities preventing protein aggregation within the cell. They are called cellular thermometers, which have a key feature to thermo-tolerance in all species. Overexpression of HSPs provide protection against hyperthermia, circulatory shock, and cerebral ischemia during heat stroke which signifies the central role of HSP in cryoprotection. Most importantly, the *HSP70* and *HSP90* are produced in all cells that sustain the impact of heat stress as prominent biomarkers. The components of heat shock response include heat shock factors (HSFs), heat shock elements (HSE), and HSP. These levels and quantity of HSP expression are pivotal currently to evaluate the potent molecular response from the affected cells. Consequently, the approach of targeting the genotypic markers in the quest of climate change is of superior importance to develop thermo-tolerant breeds, that would thrive well in different agro-ecological zones.

KEYWORDS: Global warming, thermo-tolerant, heat shock proteins, biomarker, heat stress.

QUANTITATIVE EXPRESSION PATTERN OF MEAT QUALITY GOVERNING GENES IN HEAT STRESSED SHEEP

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ABSTRACT

In the global context, sheep have a greater ability to cope with environmental stress factors, which can be attributed to the presence of sheep in various geographical and topographical locations. However, global temperatures are projected to increase, and sheep will therefore be exposed to higher temperatures more frequently and for longer periods. As a result, heat stress has been identified as one of the key vulnerabilities confronting the sheep meat production industries. Heat stress not only causes physiological and metabolic changes in live animals but also has a significant impact on meat production, affecting carcass yield, composition, and meat quality attributes. Chronic heat stress increases the meat's ultimate pH, myofibrillar fragmentation, and decreases drip losses, making the meat appear darker. To counteract the heat-stressed condition, Heat Shock Proteins (HSP) play a significant role by preventing cellular damage and protein degradation. There is an upregulation of mRNA expression of *HSP70*, *HSP90*, and *HSP27* in the skeletal muscles of heat-stressed sheep. Another indicator for heat stress expression is the Calpain system (*CAPN1* and *CAPN2*), which is a proteolytic system affecting meat tenderness, wherein there is a reduced expression of these genes. Further, there is an additional indicator called the Myostatin gene (*MSTN*) where there is a downregulation of these genes during heat stress as these are involved in muscle development and differentiation. Thus, the significant alteration in the expression patterns of the *MSTN*, *CAPN1*, *CAPN2*, *HSP27*, *HSP70*, and *HSP90* genes clearly indicates the significance of these genes for reflecting the meat quality of heat stress in sheep. As a result, the expression pattern of various meat quality-governing genes aids in controlling heat stress, improving meat quality, and assisting the farming community in maintaining production.

KEYWORDS: Climate change; Heat stress; Heat shock proteins; Meat quality.

EFFECTS OF CLIMATE CHANGE ON PESTS AND DISEASES OF SELECTED CROPS; IMPLICATION FOR AI-DRIVEN TECHNOLOGIES

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ABSTRACT

The claim that most of the available studies on the effects of climate change on pests and diseases of crops are not empirical research calls into question whether climate effects on crop pests and diseases are real. This paper seeks to establish the facts about the effects of climate change on diseases and pests of crops in Nigeria and other African countries, and the implications of AI-driven technologies for mitigating these effects. It employs Preferred Reporting Items for Systematic Reviews and Meta-Analyses to ensure evidence-based findings. Boolean expressions were used to identify 153 articles of which 99 were used from trusted databases including Research for life, Scopus, Web of Science, Google scholar and AJOL databases. Special attention was given to empirical studies based on field or lab experiments, concrete observation, and policy reports. Findings revealed that an incidence of pests and diseases with links to changes in climatic factors has been witnessed. More fall armyworms, corn earworms, stem borers, tar spot complexes, cocoa pod borers, black pod diseases, witches' broom, swollen shoot virus, vascular wilt, termite and mirid invasions, brown streak diseases, bogomoviruses, cassava witches' broom, and red mite and mealy bug invasions have been observed in maize, cocoa, and cassava. Improved varieties for identified crops, more extension supports, and agroforestry were major coping strategies. This study further identified that AI-driven technologies are the best options for adapting and mitigating the effects of climate change on crop diseases and pests and therefore recommends gender-inclusive AI-driven technologies for climate mitigation and adaptation.

KEYWORDS: Maize, cassava, cocoa, AI, temperature, humidity, and carbon dioxide.

BIOCOMPOSITE BASED ON POLYMER AND DRY FRUIT WASTE FOR TOXIC DYE REMOVAL TO TREAT WASTEWATER

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ABSTRACT

The biocomposite based on polymer and bio-waste such as polyindole@Walnut Shell (PI@WS) was synthesized and used as an effective adsorbent for the adsorption of refractory organic contaminant such as malachite green (MG) from aqueous solution. The effect of pH, adsorbate initial concentration, adsorbent (PI@WS) dose, and temperature were studied to identify the optimized condition for MG adsorption. The MG dye was adsorbed within a few minutes under optimized experimental conditions with good reusability performance of the biocomposites upto five cycles.

HOMOGENOUS CATALYSIS BY TERT-BUTANOL FOR SENSITIZER-MEDIATOR ELECTRON TRANSFER IN WATER

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ABSTRACT

The interaction between the sensitizer and the mediator is one of several components that keeps the oxidation-reduction process running in a DSSC, which converts solar energy into electrical energy. Therefore, this core oxidation-reduction reaction should have high rate that can be achieved by homogenous catalysis. Homogenous catalysis may improve a DSSC's efficiency, cost-effectiveness, and environmental friendliness by use of non-toxic environmental friendly solvent in small proportion to water. This may catalyze the rate of reaction and may increase its stability and cost-effectiveness because of water. As a result, this study is based on the use of 10% (v/v) tertiary butyl alcohol as a catalyst to enhance the rate of reaction of dicyanobis(2,2'-dipyridyl) iron(III)-iodide in 90% (v/v) aqueous/water medium. The rate law and mechanism was proposed in the selected reaction media.

**MIR-320A TARGETS JAK/VEGFA AXIS COMPONENTS IN NON-SMALL CELL
LUNG CANCER: A BIOINFORMATIC TARGETOME EVALUATION****Alireza Ahmadi**University of Tabriz, Faculty of Natural Sciences, Department of Animal Biology, Tabriz,
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IranORCID ID: <https://orcid.org/0009-0006-8221-8637>**Mohammad Khalaj-Kondori**University of Tabriz, Faculty of Natural Sciences, Department of Animal Biology, Tabriz,
IranORCID ID: <https://orcid.org/0000-0001-9231-889X>**ABSTRACT**

Lung cancer is the leading cause of cancer-related deaths worldwide. Many studies have shown that the activation of the VEGFA pathway is associated with the proliferation and angiogenesis of non-small cell lung cancer (NSCLC). Various miRNAs play important roles in the occurrence and development of lung cancer. By combining with corresponding target genes and regulating their expression levels, miRNAs can function as tumor suppressor genes or oncogenes to regulate the biological processes of lung cancer. In the study, we aimed to find miRNAs targeting JAK/VEGFA signaling components to suppress cancer properties. The genes enrolling in the JAK/VEGFA signaling pathway were discovered using KEGG pathways. The miRNAs that target JAK1/2/3, STAT1/3, and VEGFA genes were pulled out using the miRWalk version 3.0 database. MiRNAs with the highest binding score were selected. The common miRNAs targeting those genes were chosen using the InteractiVenn web tool. Finally, miRNAs that play a role in NSCLC and had experimental validation were discovered utilizing the miRCancer database. Using miRWalk, 1291, 397, 997, 981, 1143, and 952 miRNAs were discovered which target JAK1/2/3, STAT1/3, and VEGFA, respectively. Thirty-three common miRNAs were chosen. Then, hsa-miR-320a was validated to be downregulated in NSCLC based on miRCancer evidence. MiR-320a targets all JAK1/2/3, STAT1/3, and VEGFA with a high binding probability in NSCLC which might be considered a therapeutic approach suppressing angiogenesis and proliferation.

KEYWORDS: bioinformatics, JAK/STAT, miR-320a, NSCLC, targetome, VEGFA.

**COMPARATIVE INVESTIGATION OF THE EFFECT OF SORAFENIB AND
TUCATINIB DRUGS ON DIFFERENT CHAINS OF VEGFA AND VEGFR2: A
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VEGFA and its receptor, VEGFR2, could promote proliferation, migration, and angiogenesis in different types of cancer. Sorafenib is an inhibitor of many proteins, such as VEGF receptor 2 and 3 kinases, tyrosine kinase, etc. Tucatinib is a tyrosine kinase inhibitor that targets the HER2 and is used in the treatment of advanced cancers. In this descriptive-analytical study, we investigated the effects of Sorafenib and Tucatinib drugs on different chains of VEGFA and VEGFR2. The most appropriate three-dimensional structures of VEGFA and VEGFR2 were downloaded from the uniprot database. Utilizing the Chimera software, best-fitting chains have been selected. Water molecules were removed from the protein and hydrogen molecules were added to its structure. Further, the three-dimensional structures of Sorafenib and Tucatinib were downloaded from the PubChem database. The interactions of the drugs and the proteins were investigated using HDOCK Server, an online web tool. VEGFA and VEGFR2 each have 6 chains including “A, B, V, W, X, Y” and “A, B, C, D, E, R” respectively. The X and Y chains of VEGFA and the E and R chains of VEGFR2 were chosen for better conformity and their interactions with Sorafenib and Tucatinib were evaluated. VEGFA-Y chain and VEGFR2-R chain were more possible to bind to Sorafenib (docking score = - 165.60, confidence score = 0.58 for Y, docking score = - 161.70, confidence score = 0.56 for R) and Tucatinib (Docking Score = - 167.47, confidence score = 0.59 for Y, Docking Score = - 163.13, confidence score = 0.56 for R) compared to X and E chains. VEGFA-Y and VEGFR2-R chains are more likely to bind to Sorafenib and Tucatinib to suppress cancer progression caused by VEGFA and VEGFR2. In addition, Tucatinib could be a more effective option due to its more negative docking score compared with Sorafenib.

KEYWORDS: Anti-cancer, Anti-VEGF, Molecular docking, VEGFA, VEGFR2.

EARTHQUAKE-INDUCED BUILDING DAMAGE DETECTION USING SATELLITE IMAGES WITH ARTIFICIAL INTELLIGENCE

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ABSTRACT

The devastating earthquakes of February 6, 2023, in Turkey which are highlighted the critical need for rapid and accurate damage assessment methodologies. This study presents a novel approach for automatically detecting earthquake-induced building damage using satellite imagery and Artificial Intelligence (AI).

We trained a deep learning model on a dataset of 2,735 images comprising screenshots of damaged buildings from the Turkish General Directorate of Mapping (HGM KURE) application and undamaged buildings from Google Maps. The model achieved high accuracy in differentiating between damaged and undamaged structures, demonstrating its potential for large-scale damage assessment after natural disasters. This research paves the way for efficient and timely post-earthquake response mechanisms. The proposed AI-powered solution offers several advantages over traditional methods, including:

- **Rapid assessment:** Covering large areas rapidly and efficiently compared to manual inspections.
- **Accessibility:** Leveraging readily available satellite imagery, eliminating dependence on ground-based personnel.
- **Scalability:** Adaptable to various earthquake scenarios and regions with minimal reliance on local data availability.

This study contributes to advancing AI-driven disaster response technologies. Future work will involve further model refinement, exploring multi-modal data integration and enhancing accuracy for diverse building types and damage severities. The ultimate goal is to develop a robust and widely applicable system for rapid earthquake damage detection, ultimately helping save lives and expedite post-disaster recovery efforts.

The deep learning model with different methods is trained on the dataset which is achieved high accuracy in distinguishing between damaged and undamaged buildings. The model achieved

high accuracy for various building types and damage severities. These results demonstrate the potential of deep learning to automatically detect earthquake-induced building damage.

KEYWORDS: Artificial Intelligence, Building and Earthquake, Damage Detection.

A NEW RENEWABLE ENERGY EFFICIENCY FORECASTING SYSTEM FOR SUMMERHOUSES

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ABSTRACT

This study focuses on leveraging data from wind turbine charge controllers, solar panel charge controllers and battery management systems to implement time series algorithms for predicting energy production and forecasting battery depletion for residential buildings. The goal is to develop a robust renewable energy efficiency system enhancing the reliability of renewable energy for summerhouses. Real-time data from wind turbines and solar panels including wind speed, solar irradiance and battery state of charge which are used for preprocessing phase of the system and relevant features are extracted to capture temporal patterns influencing energy production.

Time series algorithms like ARIMA and SARIMA analyze historical data to predict energy creation for the next months. The model considers battery discharge patterns to estimate the anticipated time of energy storage depletion. Validation using historical data ensures accurate and reliable predictions. Results provide valuable insights for proactive energy management, optimizing renewable energy utilization and contributing to sustainable energy practices. The developed forecasting system offers a practical tool to anticipate renewable energy availability and manage energy storage system depletion, enhancing overall resilience and efficiency of renewable energy installations. In conclusion, development of forecasting systems for hybrid renewable energy systems has a big importance for cities and countries' economies due to renewable energy production and energy efficiency.

KEYWORDS: Energy Efficiency, Forecasting System, Renewable Energy.

HIGH TECHNOLOGY CONNECTIONS IN AVIONICS SYSTEMS

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ABSTRACT

Today's aviation sector is adopting a range of high-tech solutions to ensure the safety and efficient management of aircraft. One such solution is satellite communication employed in avionics systems. Satellite communication facilitates aircraft control, monitoring, and data exchange, offering significant advantages to the aviation industry. The broad coverage area, continuous connectivity, and high data transfer speed make satellite communication indispensable in aviation. Applications of this technology encompass flight control, data transfer, internet access, and emergency communication. Aircraft can communicate with flight control systems through satellite connections, swiftly transfer data, and effectively communicate in emergency situations. Satellite connections also provide internet access to onboard systems, enabling passengers to use the internet during flights. Key technologies in satellite communication include satellite service providers, satellite antennas, modems, and integration software. Companies like Iridium, Inmarsat, Thuraya offer various services to the aviation sector. Satellite antennas and modems are utilized in aircraft to establish satellite connections, and these technologies work seamlessly integrated with avionics systems, playing a critical role in aircraft safety and efficiency. Satellite communication stands out as a technology contributing significantly to modern air transportation. By enabling safer, more efficient, and effective aircraft management, this technology opens new horizons in the aviation industry. In the continually evolving aviation sector, the role and impact of satellite communication are expected to become even more crucial in the future.

KEYWORDS: Satellite Technology, High Technology, Modern Aviation, Satellite Antenna.

AVİYONİK SİSTEMLERDE YÜKSEK TEKNOLOJİ BAĞLANTILARI

ÖZET

Günümüz havacılık sektörü, hava araçlarının güvenliğini ve etkin yönetimini sağlamak adına bir dizi yüksek teknoloji çözümünü benimsemektedir. Bu çözümlerden biri, aviyonik sistemlerde kullanılan uydu haberleşmesidir. Uydu haberleşmesi, uçakların kontrolünü, izlenmesini ve veri alışverişini sağlayarak, havacılık endüstrisine önemli avantajlar sunmaktadır. Geniş kapsama alanı, sürekli bağlantı imkanı ve yüksek veri transfer hızı gibi avantajlar, uydu haberleşmesini havacılıkta vazgeçilmez kılıyor. Bu teknolojinin uygulama alanları arasında uçuş kontrolü, veri transferi, internet erişimi ve acil durum haberleşmesi bulunmaktadır. Uçaklar, uydu bağlantıları aracılığıyla uçuş kontrol sistemleri ile iletişim kurabilir, verileri hızlı bir şekilde aktarabilir ve acil durum durumlarında etkili bir haberleşme sağlayabilirler. Uydu bağlantıları aynı zamanda uçak içindeki sistemlere internet erişimi sağlayarak, yolcuların uçuş sırasında internet kullanımını mümkün kılar. Uydu haberleşmesinin temel teknolojileri arasında uydu sağlayıcıları, uydu antenleri, modemler ve entegrasyon

yazılımları yer almaktadır. İridium, Inmarsat, Thuraya gibi uydu sağlayıcıları, havacılık sektörüne çeşitli hizmetler sunmaktadır. Uydu antenleri ve modemler, uçaklarda uydu bağlantılarını sağlamak için kullanılır ve bu teknolojiler, aviyonik sistemlerle entegre bir şekilde çalışarak, uçakların güvenliği ve etkinliği açısından kritik bir rol oynar. Uydu haberleşmesi modern hava taşımacılığına önemli katkılarda bulunan bir teknoloji olarak öne çıkmaktadır. Bu teknoloji, hava araçlarının daha güvenli, verimli ve etkili bir şekilde yönetilmesini sağlayarak, havacılık sektörüne yeni ufuklar açmaktadır. Sürekli gelişen havacılık endüstrisinde, uydu haberleşmesinin rolü ve etkisi gelecekte daha da önem kazanmaya devam edecektir.

ANAHTAR KELİMELER: Uydu Teknolojisi, Yüksek Teknoloji, Modern Havacılık, Uydu Anten.

HIGH TECHNOLOGY CONNECTIONS IN AVIONICS SYSTEMS

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ABSTRACT

Today's aviation sector is adopting a range of high-tech solutions to ensure the safety and efficient management of aircraft. One such solution is satellite communication employed in avionics systems. Satellite communication facilitates aircraft control, monitoring, and data exchange, offering significant advantages to the aviation industry. The broad coverage area, continuous connectivity, and high data transfer speed make satellite communication indispensable in aviation. Applications of this technology encompass flight control, data transfer, internet access, and emergency communication. Aircraft can communicate with flight control systems through satellite connections, swiftly transfer data, and effectively communicate in emergency situations. Satellite connections also provide internet access to onboard systems, enabling passengers to use the internet during flights. Key technologies in satellite communication include satellite service providers, satellite antennas, modems, and integration software. Companies like Iridium, Inmarsat, Thuraya offer various services to the aviation sector. Satellite antennas and modems are utilized in aircraft to establish satellite connections, and these technologies work seamlessly integrated with avionics systems, playing a critical role in aircraft safety and efficiency. Satellite communication stands out as a technology contributing significantly to modern air transportation. By enabling safer, more efficient, and effective aircraft management, this technology opens new horizons in the aviation industry. In the continually evolving aviation sector, the role and impact of satellite communication are expected to become even more crucial in the future.

KEYWORDS: Satellite Technology, High Technology, Modern Aviation, Satellite Antenna.

AVİYONİK SİSTEMLERDE YÜKSEK TEKNOLOJİ BAĞLANTILARI

ÖZET

Günümüz havacılık sektörü, hava araçlarının güvenliğini ve etkin yönetimini sağlamak adına bir dizi yüksek teknoloji çözümünü benimsemektedir. Bu çözümlerden biri, aviyonik sistemlerde kullanılan uydu haberleşmesidir. Uydu haberleşmesi, uçakların kontrolünü, izlenmesini ve veri alışverişini sağlayarak, havacılık endüstrisine önemli avantajlar sunmaktadır. Geniş kapsama alanı, sürekli bağlantı imkanı ve yüksek veri transfer hızı gibi avantajlar, uydu haberleşmesini havacılıkta vazgeçilmez kılıyor. Bu teknolojinin uygulama alanları arasında uçuş kontrolü, veri transferi, internet erişimi ve acil durum haberleşmesi bulunmaktadır. Uçaklar, uydu bağlantıları aracılığıyla uçuş kontrol sistemleri ile iletişim kurabilir, verileri hızlı bir şekilde aktarabilir ve acil durum durumlarında etkili bir haberleşme sağlayabilirler. Uydu bağlantıları aynı zamanda uçak içindeki sistemlere internet erişimi sağlayarak, yolcuların uçuş sırasında internet kullanımını mümkün kılar. Uydu haberleşmesinin

temel teknolojileri arasında uydu sağlayıcıları, uydu antenleri, modemler ve entegrasyon yazılımları yer almaktadır. İridium, Inmarsat, Thuraya gibi uydu sağlayıcıları, havacılık sektörüne çeşitli hizmetler sunmaktadır. Uydu antenleri ve modemler, uçaklarda uydu bağlantılarını sağlamak için kullanılır ve bu teknolojiler, aviyonik sistemlerle entegre bir şekilde çalışarak, uçakların güvenliği ve etkinliği açısından kritik bir rol oynar. Uydu haberleşmesi modern hava taşımacılığına önemli katkılarda bulunan bir teknoloji olarak öne çıkmaktadır. Bu teknoloji, hava araçlarının daha güvenli, verimli ve etkili bir şekilde yönetilmesini sağlayarak, havacılık sektörüne yeni ufuklar açmaktadır. Sürekli gelişen havacılık endüstrisinde, uydu haberleşmesinin rolü ve etkisi gelecekte daha da önem kazanmaya devam edecektir.

ANAHTAR KELİMELER: Uydu Teknolojisi, Yüksek Teknoloji, Modern Havacılık, Uydu Anten.

GIS-BASED MULTICRITERIA SITE SELECTION FOR DETERMINING RETAIL STORE LOCATIONS

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ABSTRACT

With the increasing population and diversifying consumer needs, the issue of accurate site selection becomes more critical every day, especially in rapidly urbanizing cities. Rapid advancements in technology, particularly in the household appliance sector, shape consumer needs and transform home technologies. In parallel with this transformation, investments in stores that meet consumer needs have become strategically crucial. Site selection is a fundamental element in creating advantageous competitive opportunities for commercial establishments and increasing the return on investment.

In this context, accurate location selection in the site selection process is more precise with GIS and Multicriteria Decision Analysis. Additionally, demographic structure and competitive analysis are of great importance among the criteria for correct site selection.

This study focuses on store location selection in the household appliance sector, identifying the most suitable locations for household appliance stores by conducting demographic analyses and competition analyses with demographic data and other retail points. The study area selected is the Cekmekoy district in Istanbul, which is rapidly urbanizing and undergoing commercial transformation.

The study uses demographic data at the neighborhood scale covering the Çekmeköy district in Istanbul, including Total Number of Households, Average Household Income (TL/Month), Furniture, Household Appliances, and Home Care Expenditure (TL/Month), and Total Population Change by 2025 (Person). Additionally, Retail Stores, Transportation Points, and Retail Streets at the neighborhood scale are included in the scope of the study.

The Grid Modeling method is used to overlap the data, dividing it into 500x500 meter grids for scoring. In the weighting of the grids, the Best-Worst Method (BWM) is used in conjunction with expert opinions. Furthermore, suitability analysis is conducted for the determination of the most suitable locations for household appliance stores using the existing Retail Streets data.

KEYWORDS: GIS, MCDA, Site Selection, Retail

PERAKENDE MAĞAZA KONUMLARININ BELİRLENMESİ İÇİN CBS TABANLI ÇOK ÖLÇÜTLÜ YER SEÇİMİ

ÖZET

Artan nüfus ve çeşitlenen tüketici ihtiyacıyla birlikte özellikle hızlı şehirleşen kentlerde çok fazla ticari işletmenin açılmasıyla doğru yer seçimi konusu her geçen gün daha fazla önem kazanmaktadır.

Hızla değişen ve gelişen teknolojiyle birlikte özellikle beyaz eşya sektöründe gerçekleşen ilerlemeler tüketicilerin ihtiyaçlarını şekillendirmekte ve ev teknolojilerini dönüştürmektedir. Bu dönüşüm paralelinde tüketici ihtiyaçlarını karşılayacak mağaza yatırımları oldukça stratejik bir noktaya ulaşmıştır. Ticari kuruluşların avantajlı rekabet imkanı yaratması ve yatırımın geri dönüşünü artırmasında yer seçimi en temel taşlardır.

Bu kapsamda yer seçimi sürecinde doğru lokasyon seçimi CBS ve Çok Ölçütlü Karar Verme Analizleriyle daha isabetli olmaktadır. Bununla beraber doğru yer seçiminin kriterlerinden demografik yapı ve rekabet analizi büyük önem arz etmektedir.

Bu çalışmada beyaz eşya sektöründe mağaza yer seçimi için, demografik verilerle birlikte beyaz eşya ve diğer perakende noktalarıyla rekabet analizleri yapılarak beyaz eşya mağazaları için en uygun lokasyonlar tespit edilmiştir. Çalışma alanı olarak İstanbul ilinde hızla konutlaşan ve ticari dönüşüm yaşayan Çekmeköy ilçesi seçilmiştir.

Çalışmada İstanbul ili Çekmeköy ilçesini kapsayan mahalle ölçeğinde Toplam Hane Sayısı (Adet), Ortalama Hane Geliri (TL / Ay), Mobilya, Ev Aletleri ve Ev Bakımı Harcaması (TL / Ay), Toplam Nüfus 2025 Değişimi (Kişi) demografik verileri kullanılmıştır. Ek olarak mahalle ölçeğinde Perakende Mağazaları, Ulaşım Noktaları ve Perakende Caddeleri çalışma kapsamına dahil edilmiştir.

Verilerin birbiri ile örtüştürülmesinde Grid Modelleme yöntemi kullanılmış olup 500x500 metre gridlere bölünerek puanlama yapılmıştır. Gridlerin ağırlıklandırılmasında uzman görüşleriyle birlikte En İyi En Kötü Yöntemi (BWM) kullanılmıştır. Mevcut Perakende Caddeler verisiyle de beyaz eşya mağazaları için en uygun yer tespitinde uygunluk analizi yapılmıştır.

ANAHTAR KELİMELER: CBS, ÇÖKA, Yer Seçimi, Perakende.

GIS BASED SITE SELECTION MODEL FOR PARCEL LOCKERS: A CASE STUDY IN ISTANBUL

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ABSTRACT

The rapid technological advancements since the last quarter of the twentieth century have profoundly impacted various aspects of our lives, introducing the concept of electronic commerce. The Covid-19 pandemic that emerged at the beginning of 2020 and swiftly spread worldwide further accelerated the impact of technology, resulting in the closure of physical stores in the countries and encouraging consumers to stay at home. This shift significantly influenced the volume of retail e-commerce, reaching unprecedented levels. The increased volume of e-commerce led to a substantial rise in last-mile deliveries, prompting several companies to focus on new delivery models to cope with the associated operational costs. Parcel lockers, also known as automated parcel terminals, provide a solution to the challenges of last-mile delivery. In Europe, several delivery companies have successfully implemented parcel lockers nationwide. In Turkey, the use of parcel lockers, which began in 2010, is becoming increasingly widespread. The locations of parcel lockers play a crucial role in the success of their usage. The criteria used to determine these locations vary from country to country due to local conditions. The study aims to identify site selection criteria specific to Turkey that could play crucial roles in the placement of parcel lockers and to develop a model based on these criteria. The focus is on five districts in Istanbul, which account for 36% of Turkey's e-commerce volume. Site selection criteria commonly used in the literature were evaluated in the context of Turkey and supported by expert opinions. Grid areas were established within the five districts, and potential areas for parcel lockers were identified based on the weights assigned to the criteria. The study results indicate that grids with high concentrations of residential areas, business centers, supermarkets, and gas stations hold high potential for parcel lockers.

KEYWORDS: E-commerce, Last-mile delivery, Parcel lockers, GIS, Site selection, Istanbul.

A MIXED REVIEW ON ETHICAL AND SECURITY ISSUES OF ARTIFICIAL INTELLIGENCE (AI) TECHNOLOGY

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ABSTRACT

Artificial Intelligence (AI) is rapidly unmasking its potentials and finding long lasting solutions to the multi-dimensional challenges of human race. The ability of AI systems to unleash answers to long held secrets and perform ambiguous tasks have ensure its applications across numerous industries. According to Halal (2003), AI has become an important component in virtually all fields including science, engineering, education, business, medicine, accounting, finance, economics, marketing, law and many more. While AI tools present limitless range of functionality for these industries, the application of AI raises a number of security and ethical concerns. This paper is a descriptive survey on the applications of AI. The paper evaluated specific applications of AI and highlighted some security and ethical related issues with AI. For the purpose of gathering vital information for the paper discussion, online Google form questionnaire instrument was used to collect relevant data from respondents. The responses gathered were subjected to reliability analysis. Conclusively, affirmed that AI systems have the potentials that can identify vulnerabilities, detect anomalies and recommend appropriate security measures. However, the ethical considerations surrounding AI includes fairness, transparency and privacy protection.

KEYWORDS: Artificial Intelligence, AI, Application, Security, Ethical Concerns.

INTRODUCTION



Breakthroughs introduced by Artificial Intelligence (AI) systems have helped to unleash solutions to long held challenges and perform complex activities in various industries. AI tools have also present a huge range of functionality in several industries and geared up drastic

societal changes in fields such as science, engineering, education, business, medicine, accounting, finance, economics, marketing, law and many more across the globe. However, great caution is expected to be taken in the development and deployment of AI systems so as to partake in its societal benefits. AI systems must therefore be trusted and carefully regulated in line with professional codes, moral values, social norms and ethical considerations which includes fairness, transparency and privacy protection in the same scenario.

RELATED LITERATRE

The term Artificial Intelligence (AI) refers to the ability of a machine that can demonstrate the intelligence of human beings such as logical reasoning, learning and problem-solving (Singh & Jain, 2018). According to [Aiken & Epstein \(2000\)](#), artificial intelligence is a discipline of science and technology that capacitates computer programs and intelligent computers to perform activities that requires human intelligence. [Chien et al. \(2020\)](#) & [Kumar et al.\(2023\)](#) express that AI is a major advancement in technology that has enabled humans to replace manual work with intellectual levels and superior mental capacities in numerous industries. However, AI makes use of relevant sources of information such as Big Data to execute superior performance for specified tasks ([Kaplan & Haenlein, 2020](#)). Artificial intelligence works in several dimensions as humans do: Thinking Humanly (Haugeland, 1985); Acting Humanly (Kurzweil, 1990); Thinking Rationally (Chamlak & McDermott, 1985) and Acting Rationally (Poole, et al., 1998). AI has swiftly advanced in recent years and has been applied to offer many benefits across countless industries ([Strachna & Asan, 2020](#)).

Some Applications of Artificial Intelligence in the Society

The use of Artificial intelligence has span through variety of ways in AI today's society. AI is increasingly becoming important in the modern world because it has the potentials that can efficiently handle complicated problems in various areas including Healthcare, E-Commerce, Finance, Marketing and many more. Viz:-

1. Healthcare:
So many healthcare institutions are adopting AI technologies in their vein to save life of patients under intensive care. An example of artificial intelligence in healthcare is Patience Health Monitoring System.
2. E-Commerce:
The application of AI in eCommerce is increasingly becoming a competitive advantage, as customers can use AI to find related products in their preferred brand, size or colour.
3. Finance:
A lot of applications in Artificial intelligence are useful in assisting financial industries to streamline and optimize routine procedures. The AI technology provides features such as fraud detection, risk assessment, financial advisory services and automated trading in Finance.
4. Marketing:
Artificial intelligence (AI) applications are frequently utilized in marketing campaigns where speed is critical as AI systems learn how to efficiently engage customers based on customer and data profiles without the need for marketer's intervention thereby ensuring optimal productivity.
5. Social Media:
Social networking firms use artificial intelligence for content creation as well as demographics. AI is also useful in analyzing large amounts of data to determine different hashtags, patterns and what's trending.
6. Agriculture

The application of AI technology in Agriculture includes airborne surveillance, remote sensing, proximity sensing, pest and weed control, harvesting and many more.

7. Robotics:

Artificial intelligence is more effectively used in robotics to developing more efficient robots. AI provides robots with computing visuals thereby allowing them to sense, react and navigate appropriately.

8. Education

AI chatbot can be used to communicate with students as a teaching assistant. AI is equally useful in the automation of student grading so that tutors will have time to do other tasks. It is also crucial to emphasize that AI can work as personal virtual tutor for students in the nearest future.

Security and Ethical related Issues with AI

There are so many issues related with AI as discussed in the study of Yapo & Weiss (2018). Viz:-

1. Security

Countless number of monitoring devices and powerful weapons based on automated mechanisms and AI are found all around the world. These weapons are very destructive and can win wars without human presence. The possibility of having such weapons in the hands of terrors has posed great global concerns.

2. Unemployment

The biggest threat of having excessive automation is on human labor. Imagine a scenario where more workload are being carried out by machines at various production units, the implication is that less human service will be required.

3. Inequality

It will be very difficult to assess the income sharing if the machines are playing a vital role in earning for a company. Most of the companies will be in a dilemma to decide the wages as it can depend more on the machines as compared with human work force. In other words the company providing AI based facilities will earn more money as compared to human beings.

4. Artificial Stupidity

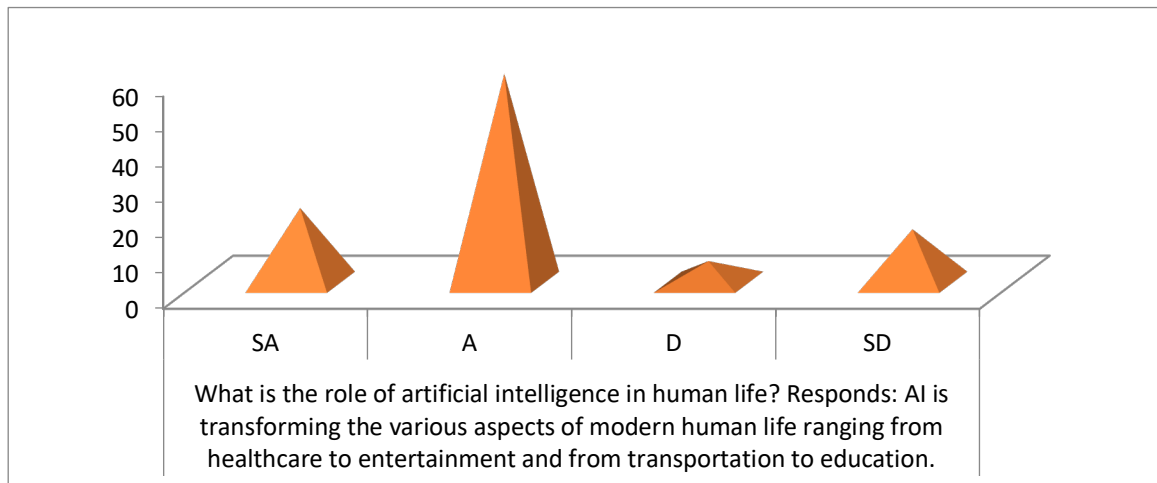
Guiding against machine error is a very difficult task. It will be a great disaster for machine to make mistakes in delicate areas such as finance, security and healthcare industries which will in return have serious impact on humans and the society at large.

MATERIALS AND METHODS

This paper adopts a descriptive survey on the applications of AI. Specific applications of AI were mentioned in the paper as retrieved from textbooks and educational magazines. The researcher also interviewed some selected AI professionals in the field of education. In order to gather more information for the paper write-up, drafted copies of questionnaires were formulated and administered to respondents using online Google form questionnaire instrument. The obtained responses were collated and subjected to Cronbach's alpha reliability analysis. The result of 0.82 gave a good reliability index of the instrument. The entire exercise took place within the space of three weeks before completion.

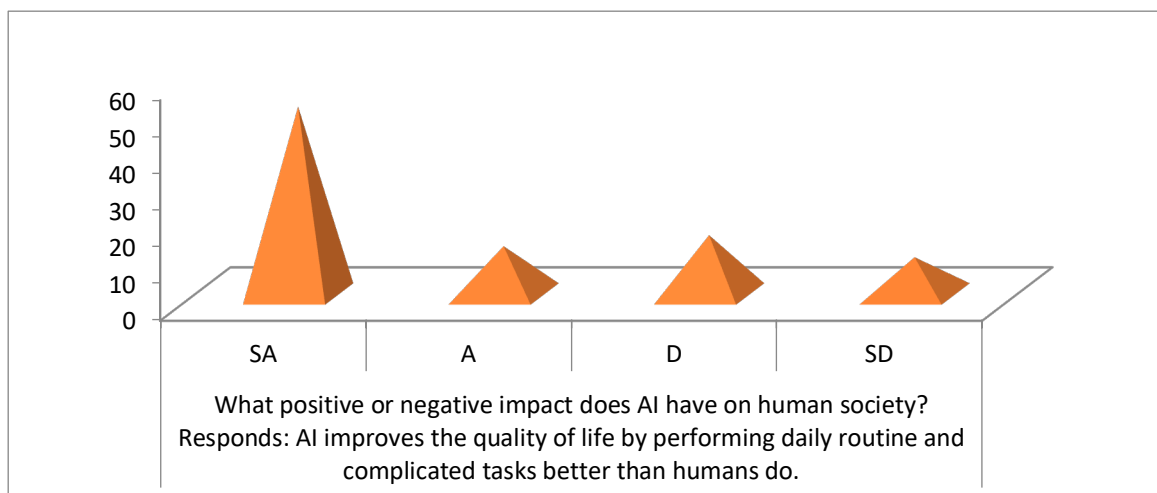
RESULT AND DISCUSSION

Fig.1: Chat Analysis

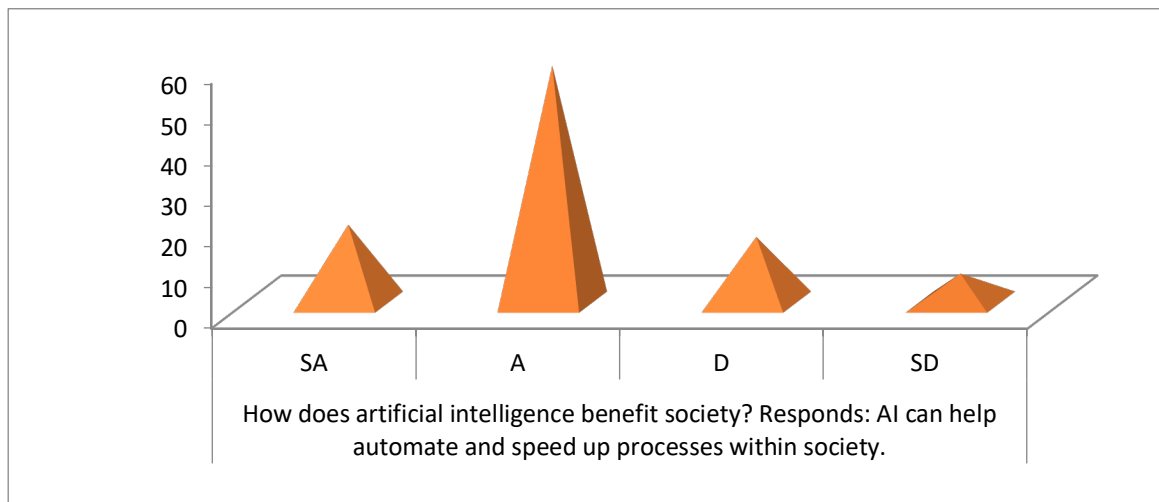


The graph plotted in figure 1 clearly depicts that a very high amount of respondents have a clear understanding of AI technology. According to the respondents, AI is transforming the various aspects of modern human life ranging from healthcare to entertainment and from transportation to education. The respondents explained further that AI technology offers many benefits such as improved accuracy, enhanced personalization and increased efficiency.

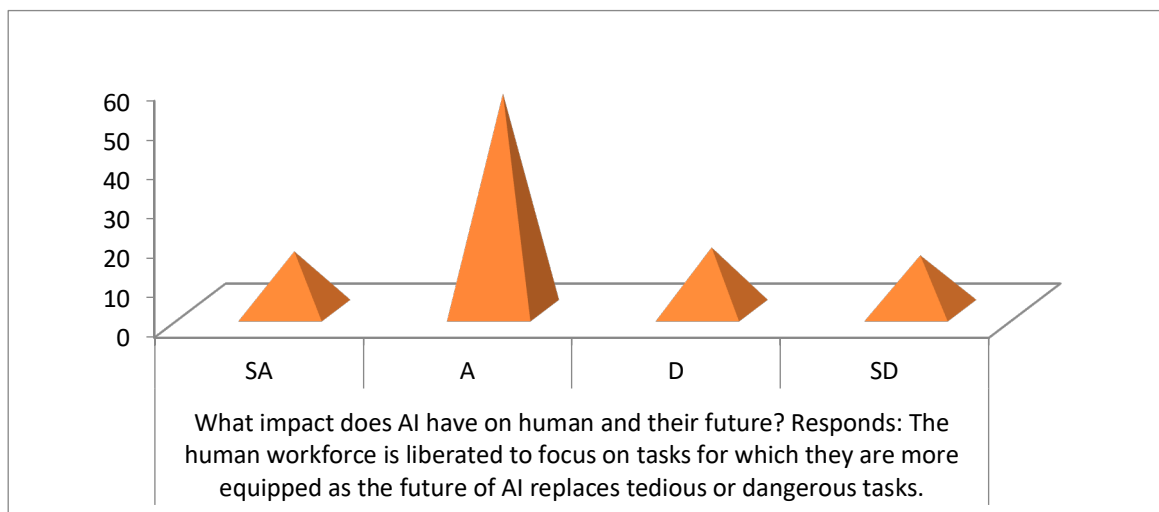
Fig.2: Chat Analysis



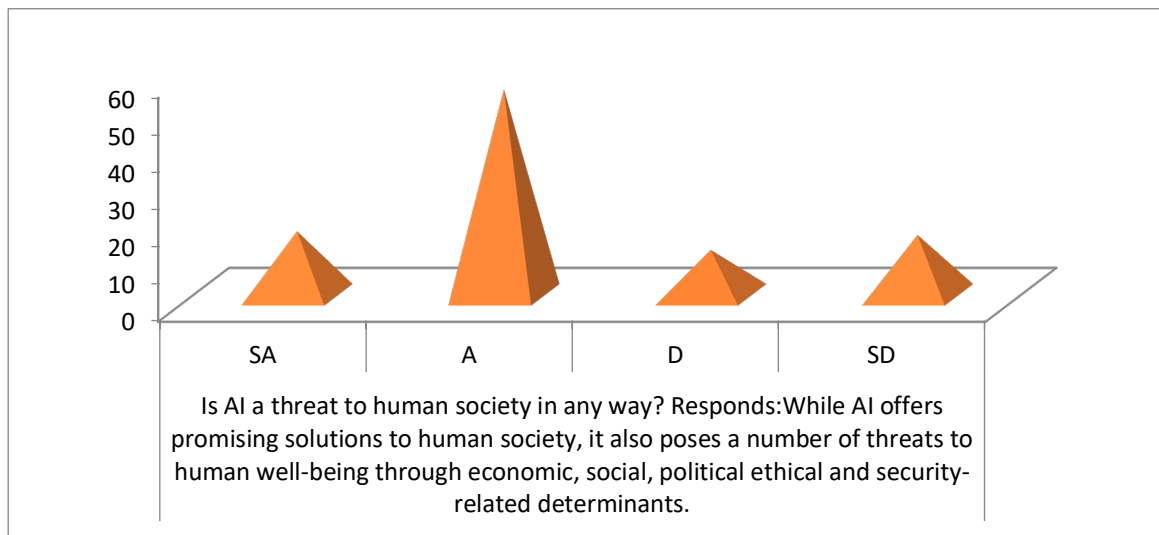
The analysis chat shown in figure 2 indicate that a higher number of respondents are of the opinion that AI helps to improve the quality of life as it aids the execution of day to day routine and complicated tasks better than humans do. According to the respondents, AI has the potentials that contribute towards making life simpler, safer, and more efficient. The respondents also express that AI-powered technologies have helped to revolutionize the way humans interact and mediate with media. With AI, there will be improved and faster way to process and analyze vast amounts of data thereby making it easier to find and access important information.

Fig.3: Chat Analysis

The graph plotted in figure 3 depicts that a greater amount of respondents concur with the statement that AI can help automate and speed up processes within society such as improving decision making or increasing the level of efficiency in the place of work. The respondents also express that AI is effectively used to help identify and find solutions to problems that humans may not ordinarily be able to tackle. The respondents mentioned that AI can help to detect and reduce unfair biases based on gender, race, nationality and many more. More so, in terms of security and ethics, AI systems help to ultimately keep data safe. Ethical AI-designed systems can help to efficiently provide data governance and model management systems.

Fig.4: Chat Analysis

The graph plotted in figure 4 shows that a significant number of respondents agree that AI highly impactful in the life and activities around humans. According to the respondents, human workforce is eventually free to concentrate on other tasks deemed necessary as AI systems are deployed to handle tedious or dangerous tasks. The development of artificial intelligence is aimed at boosting human effort in workplaces and improving work creativity and productivity.

Fig.5: Chat Analysis

The chat analysis in figure 5 depicts that a very large number of respondents agree that while AI technology offers promising solutions to human society, the same spectrum also poses a number of threats to human wellness through socio-economical, political, ethical and security related conditions.

CONCLUSION

This paper discussion is focused on the applications of Artificial Intelligent (AI). The paper evaluates some of the applications of AI and discussed some security and ethical related issues with AI. In conclusion, the paper affirmed that AI systems can be used to systematically identify vulnerabilities, detect anomalies and recommend appropriate security measures. However, the paper finally stated that the ethical considerations surrounding AI includes fairness, transparency and privacy protection.

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USING COMPUTER-ASSISTED INSTRUCTION TO IMPROVE STUDENTS' ACADEMIC PERFORMANCE IN WOODWORK TECHNOLOGY

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ABSTRACT

It has been a common topic of discussion how quickly information and communication technology is evolving and how important it is to the field of education. ICT is becoming more and more in demand in the classroom. The dependence of educational success on information and communication technologies has been demonstrated by numerous recent studies. The general public expects educational institutions to give students the skills and traits they need to succeed in the workforce before they graduate. However, this study looks at the necessity of using computer-assisted training to raise students' academic performance in woodworking technology. The study also emphasized the significance and benefits of employing CAI computer-assisted instruction to improve the instructional process in the teaching and learning of woodwork technology. Furthermore, the benefits of CAI as well as its uses for improving students' academic performance in woodwork technology were discussed. Additionally, this paper recommends among others, that for effective teaching and learning activities, the usage of CAI for instructional facilitation for woodwork technology and other vocational and technical subjects/courses should be made mandatory.

KEYWORDS: computer-assisted instruction, academic performance and woodwork technology.

COMPARISON OF FOUR NATURE INSPIRED METAHEURISTIC OPTIMIZATION FUNCTIONS

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ABSTRACT

Optimization problems are a crucial aspect of various fields, including e-commerce. In this paper, we compare the performance of four optimization algorithms for minimizing the functions I. $(x-1)*(x-1)+7$ function and II. Sphere function. The four algorithms compared are migrating birds optimization (MBO), quantum-inspired migrating birds optimization (QIMBO), particle swarm optimization (PSO), and quantum-inspired particle swarm optimization (QIPSO). We evaluate the algorithms based on the number of iterations required for convergence and the quality of the solutions obtained.

KEYWORDS: optimization, metaheuristic, mbo.

ÖZET

Optimizasyon sorunları, e-ticaret de dahil olmak üzere çeşitli alanların çok önemli bir yönüdür. Bu yazıda, I. $(x-1)*(x-1)+7$ fonksiyonu ve II. Sphere fonksiyonunu minimize etmek için dört optimizasyon algoritmasının performansını karşılaştırıyoruz. Karşılaştırılan dört algoritma göç eden kuşlar optimizasyonu (MBO), kuantumdan esinlenen göç eden kuşlar optimizasyonu (QIMBO), parçacık sürüsü optimizasyonu (PSO) ve kuantumdan ilham alan parçacık sürüsü optimizasyonu (QIPSO). Algoritmaları yakınsama için gerekli yineleme sayısına ve elde edilen çözümlerin kalitesine göre değerlendiriyoruz.

ANAHTAR KELİMELER: optimizasyon, metaheuristic, mbo.

UTILIZATION OF OKRA PROCESSING WASTE AS OKRA GUM: EXTRACTION AND PURIFICATION

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ABSTRACT

The use of natural polymers and gums has gained importance as disposable plastics and waste plastics are increasing day by day. The fact that natural polymers and gums are easily degraded in nature and are not harmful has led to an increase in their use and applications. In the world, okra gum is generally obtained from okra fruits. Using okra waste instead of these fruits that can be used as food will be beneficial in terms of both zero-waste case and economical approach. Okra gum is a natural polymer found in the milky liquid of the okra plant and is used in many areas as a binder, hydrophilic polymer and bio-adhesive. In this study, it was aimed to obtain okra gum by using the stem parts that are produced as waste during okra processing. The resulting wastes were washed with pure water, dried and ground. The gum content of the stem parts was obtained by treating the milled wastes in pure water at 70 °C. Since okra gum dissolves in water, it was separated from its solid by filtering with a coarse filter and muslin cloth. The solubility of the resulting liquid was reduced with pure ethanol (95%) and precipitated as okra gum. The resulting precipitate was separated from the liquid by filtering with filter paper. The precipitate was washed with pure ethanol to remove any impurities that may be present in its solution. Okra gum was dried in a laboratory type oven at 45 °C until it reached a constant weight, then it was ground and stored in a desiccator. The obtained okra gum was characterized by average molecular weight by viscosity values. Characterization results showed that okra gum can be obtained in high quantity and purity from okra processing wastes. The obtained okra gum is aimed to be used in hydrogel and polymer synthesis.

KEYWORDS: Polymer, Gum, Okra Waste, Okra Gum, Molecular weight.

BAMYA İŞLEME ATIĞININ BAMYA GAMI OLARAK EKSTRAKSİYONU VE SAFLAŞTIRILMASI

ÖZET

Doğal polimerlerin ve sakızların kullanımı, kullan-at plastiklerin ve atıkların her geçen gün artması ile önem kazanmıştır. Doğal polimer ve sakızların doğada kolay bozunması ve zararlı olmaması, kullanımlarının ve uygulamalarının artmasını sağlamıştır. Dünyada bamy gamı genel olarak bamy meyvelerinden elde edilmektedir. Gıda olarak kullanılabilen bu kısımların yerine bamy atıklarının kullanılması hem sıfır atık hem de ekonomi yönünden faydalı olacaktır. Bamy gamı bamy bitkisinin yapısındaki sütsü sıvıda bulunan doğal bir polimerdir ve bağlayıcı, hidrofilik polimer ve biyo-yapışkan olarak birçok alanda kullanılmaktadır. Bu çalışmada, bamy işleme sırasında atık olarak çıkan, sap kısımları kullanılarak, yapısındaki bamy gamının elde edilmesi amaçlanmıştır. Elde edilen atıklar saf su ile yıkanmış ve

kurutularak öğütülmüştür. Öğütülen atıkların, 70 °C sıcaklığındaki saf su içerisindeki muamelesi ile gam içeriğinin alınması sağlanmıştır. Bamya gamı su içerisinde çözündüğünden, kaba filtre ve müslin bez ile süzülerek katısından ayrılmıştır. Elde edilen sıvının saf etanol (%95) ile çözünürlüğü düşürülmüş ve bamya gamı olarak çöktürülmüştür. Elde edilen çökelek, filtre kâğıdı ile süzülerek çöken katı sıvısından ayrılmıştır. Çökelek, saf etanol ile yıkanarak yapısında bulunabilecek yabancı maddelerden uzaklaştırılmıştır. Laboratuvar tipi etüvde 45 °C 'de sabit tartıma gelene kadar kurutulan bamya gamı, daha sonra öğütülerek desikatörde saklanmıştır. Elde edilen bamya gamının viskozite değerleri ölçülerek ortalama molekül ağırlığı karakterize edilmiştir. Karakterizasyon sonuçları, bamya işleme atıklarından yüksek miktarda ve saflıkta bamya gamı elde edilebileceği göstermiştir. Elde edilen bamya gamının, hidrojel ve polimer sentezinde kullanılması hedeflenmektedir.

ANAHTAR KELİMELEER: Polimer, Doğal Sakız, Bamya Atığı, Bamya Gamı, Moleküler Ağırlık.

GİRİŞ

Polimerler, kökenlerine bağlı olarak doğal ve sentetik olarak sınıflandırılabilen basit yapısal birimlerin birden fazla birleşiminden oluşan makromoleküllerdir. Polimerlerin yapısal, mekanik ve fonksiyonel özellikleri, çeşitli fonksiyonel grupların düşük ve yüksek molekül ağırlıklı zincirlerle farklı amaçlarla karıştırılması yoluyla değiştirilebilir. Hem sentetik hem de doğal polimerler, sağlık sektöründe, kozmetik sektörlerinde, gıda sektöründe, plastik ve kauçuk üretim sektörlerinde vb. sektörlerde kullanılmaktadır. Günümüzde ise sürekli ilaç salımı ile kontrollü ilaç salımı vb. özelliklere sahip çeşitli ilaç dağıtım sistemlerinde sıklıkla uygulama alanı bulmaktadırlar. Bunun başlıca nedeni bu polimerlerin ilacın içeriğinin korunarak vücut genelinde dağılımını stabilize etmeleri ve ayrıca ilacın hoş olmayan tadını maskelemeleridir. Sıvı dozaj formasyonlarının ve katı dozaj formlarının akış özellikleri, bu polimerik malzemeler kullanılarak değiştirilebilir(Gomes ve diğ., 2015).

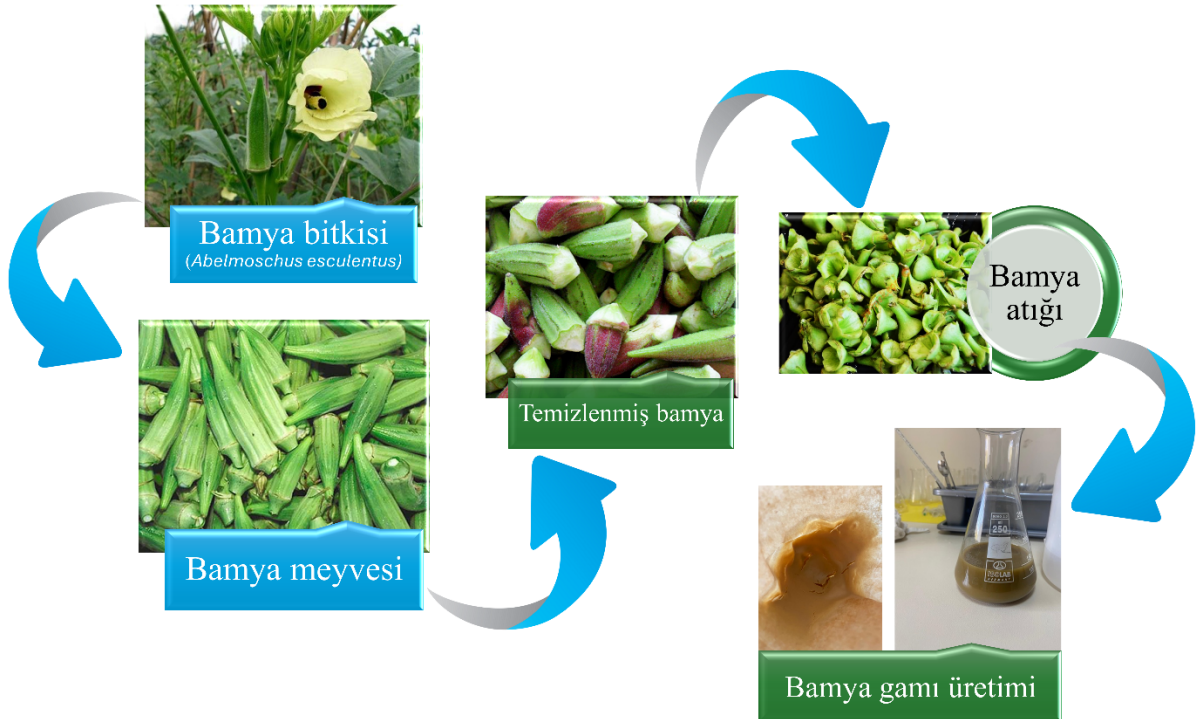
Birçok gelişmiş bitkide polisakkarit hidrokolloidler sakızlar (gam), zamklar, müsilaajlar ve gluklanlar formunda bulunur. Bu polisakarit hidrokolloidler, çok yönlü fizikokimyasal özellikleri ve yapısal çeşitlilikleri nedeniyle araştırma alanında yaygın olarak kullanılmaktadır (Giri ve diğ., 2018). Doğal sakızlarda monomerik birimler karmaşık bir şekilde bir araya getirilir. Doğal sakızların fiziksel özellikleri, şekilsiz, yarı saydam olmaları ve çoğu organik çözücüde pratik olarak çözünmez olmalarıdır; ancak yoğun, viskoz çözeltiler elde etmek için su ve diğer sulu çözeltilerde çözünürler ve jöle ürünü üretmek için suyu emerek şişerler(Choudhary ve Pawar, 2014).

Doğal gamlar yani sakızlar ve bunların türevleri, güvenli doğa, biyolojik olarak parçalanabilirlik, biyoyumluluk, toksik olmayan, immünojenik olmayan, nispeten daha ucuz ve insan tüketimine uygun olma gibi elverişli özellikleri nedeniyle gıda ve ilaç gibi çeşitli endüstrilerde yaygın olarak kullanılmaktadır (Aduba ve Yang, 2017; Badwaik ve diğ., 2013; Nehra ve diğ., 2023; Prajapati ve diğ., 2013). Gamlar çoğunlukla bitkilerden, hayvanlardan ve mikroorganizmalardan elde edilir. Bitki bazlı gamlar çoğunlukla bitkinin zarar görmesi veya olumsuz büyüme koşulları nedeniyle üretilen atıpkı veya atık ürünlerdir (Amiri ve diğ., 2021; Patten ve diğ., 2010). Patolojik durum temel olarak bitkilerin hücre duvarında meydana gelen ve gamlara dönüşen değişikliklerle karakterize edilir. Bireysel bitkilerde gam oluşum süreci aynı zamanda bitkinin ezilmesi ya da yaralanması durumunda bir tür savunma mekanizması olarak nitelendirilmektedir. Bu durum, güneş ışığı ve hava varlığında sertleşen yoğun/kalın bir sıvının sızmasına yol açar. Ortaya çıkan turuncu/bej/açık kahverengi, şeffaf ve camsı yoğun

kütleye doğal sakız adı verilir (Choudhary ve Pawar, 2014; Patten ve diğ., 2010; Williams ve Phillips, 2009).

Doğal gamlar kimyasal olarak, L-arabinoz, D-galaktoz, L-ramnoz ve D-glukuronik asit gibi şeker tuzları ile potasyum, sodyum ve magnezyum gibi bazı metal katyonlarından oluşur (Ahmed ve Ali, 2023; Dave ve Gor, 2018; Mahfoudhi ve diğ., 2012). Gamlar çoğunlukla, polimer zincirindeki dallanmanın uzunluğu, derecesi ve bağlantı türlerine göre çeşitli muhtemel varyasyonlara sahip farklı şeker birimleri içeren oldukça dallanmış yapılardan oluşur. Farmasötik ve gıda endüstrisinde formülasyon yardımcı maddesi olarak doğal polimerlerin uygulanmasına yönelik talebin artmasıyla birlikte, doğal gamlar yaygın olarak emülsifiye edici (Kadkhodae ve Mahfouzi, 2022; Yadav ve diğ., 2007), koyulaştırıcı ve (Petri, 2015), bağlayıcı (Chang ve diğ., 2023) ve ayrıca film oluşturmaya maddeler olarak tercih edilmeye başlanmıştır (Raj ve diğ., 2022). Doğal gamların aynı zamanda ağız yolu ile alınan ilaç dağıtım araçları için de güvenli olduğu raporlanmıştır (Deshmukh ve Aminabhavi, 2014; Koyyada ve Orsu, 2021).

Doğal sakızlar arasında *Abelmoschus esculentus* olarak adlandırılan bamya meyvesine ait doğal gam (sakız), yeni formülasyonların ve farmasötik yardımcı maddelerin hazırlanmasında kullanılabilecek doğal bir polimer olarak ortaya çıkan hammaddelerden biridir (Kesharwani ve diğ., 2023). Bamya gamının yapısı, farklı alanlardaki uygulamaların gereksinimlerini karşılayacak şekilde uyarlanabilir. Çok sayıda araştırmacı bamya bitkisinin farklı kısımlarının özelliklerini ve biyokütle enerjisi, kozmetik sektörü, atıksu arıtımı vb. alanlarda kullanım potansiyelini araştırmıştır (Carneiro-Marra ve diğ., 2019; Gulsen Akbay, 2024; Nagpal ve diğ., 2019). Bu çalışmada ise bamya atıklarından yüksek miktarda ve saflıkta doğal bamya gamı elde edilebileceği gösterilmiştir (Şekil 1). Üretilen bamya gamına ait viskozite değerleri analizlenerek ortalama molekül ağırlığı karakterize edilmiştir. Böylece üretilen polimerin kalitesi incelenmiştir. Elde edilen bamya gamının, ileri çalışmalarda hidrojel ve polimer sentezinde kullanılması hedeflenmektedir.



Şekil 1. Çalışmada kullanılan bamya bitkisi (*Abelmoschus esculentus*), atığı ve bamya gamı üretimi

YÖNTEM

Çalışmada Mersin bölgesinde yetişen yerel bir çiftlikten temmuz ayında hasat edilen bamya meyveleri kullanılmıştır. Bamya meyvesinin sap bölümü, konserve sebze üreten fabrikalarda olduğu gibi koni şeklinde el ile kesilmiştir. Bu kapsamda, ayıklanan bamya meyvesinin sap bölümü çalışmada bamya atığı olarak değerlendirilmiştir.

Temizlenen bamya sapsarı distile su ile yıkanarak, pislik ve atıklardan temizlenmiştir. 50 °C etüvde kurutulan sapsarı, laboratuvar tipi öğütücü kullanılarak öğütülmüştür. Öğütülen bamya sapsarı toz halinde elde edilmiştir.

Bamya kabuğu tozları, saf su ile 70 °C sıcaklıkta manyetik karıştırıcı vasıtası ile karıştırılarak 5 saat boyunca ısıtılmıştır. Elde edilen sıvının kendi halinde oda sıcaklığına gelmesi beklenmiştir. Soğuyan karışım bir müslin bez vasıtası ile katısından ayrılmıştır. Müslin bez içinden geçen küçük katıların ayrılması için bir kez de filtre kağıdında süzme işlemi uygulanmıştır.

Elde edilen sıvı, başka bir behere alınarak, etanol oranı %70 olacak şekilde %95' lik etanol ile karıştırılmıştır. Çökelek olarak çöken bamya gamı, filtre kâğıdı ile süzülerek sıvısından ayrılmıştır. Elde edilen bamya gamı, 45 °C' de etüvde kurutulmuş ve buzdolabında saklanmıştır. Elde edilen bamya gamının polimer özelliklerinin ve ortalama molekül ağırlığının belirlenmesi için Mark-Houwink Eşitliğinden faydalanılmıştır.

$$[\eta] = K \cdot M^a \quad (1)$$

Eşitlik 1' de $[\eta]$, içsel viskozite değerini, M, ortalama molekül ağırlığını, K ve a değerleri de Mark-Houwink sabitlerini belirtmektedir. Eşitliğin çözümü için, viskozite değerlerine ihtiyaç vardır. Deneylerde Oswald tipi viskozite kullanılmış ve çözücü olarak su kullanılmıştır. Polimer çözeltilerinin viskozite değerleri, saf su ile orantısal olarak hesaplanmıştır. Hesaplanan viskozite değerlerinden, Eşitlik 1'in çözümü için iki ayrı değerin hesaplanması gerekmektedir.

$$(t/t_0 - 1)/C \quad (2)$$

2 nolu eşitlikte, t, örneğin Oswald viskozimetresinden geçiş süresini, t_0 , referans çözeltinin Oswald viskozimetresinden geçiş süresini ve C, örnek konsantrasyonunu belirtmektedir.

$$\frac{1}{C} * \ln(t/t_0) \quad (3)$$

3 nolu eşitlikte, t, örneğin Oswald viskozimetresinden geçiş süresini, t_0 , referans çözeltinin Oswald viskozimetresinden geçiş süresini ve C, örnek konsantrasyonunu belirtmektedir.

Bu değerler elde edildikten sonra, konsantrasyona karşı 2 ve 3 nolu eşitlikler grafik edildiğinde, grafiklerin kayma değerlerinin kestiği nokta içsel viskozite $[\eta]$ değerini verecektir. Eşitlik 1' de bulunan değerler ilgili polimerik K ve a değerleri ile çözülerek M değeri çekilmiştir.

BULGULAR

Yapılan çalışma kapsamında, elde edilen bamya tozu, ilk olarak yüzde verim açısından değerlendirilmiştir. Ham kabuk, kurutma ve gam eldesi için elde edilen verilen Tablo 1'de verilmiştir

Tablo 1. Elde edilen ürünlerin ağırlıkları

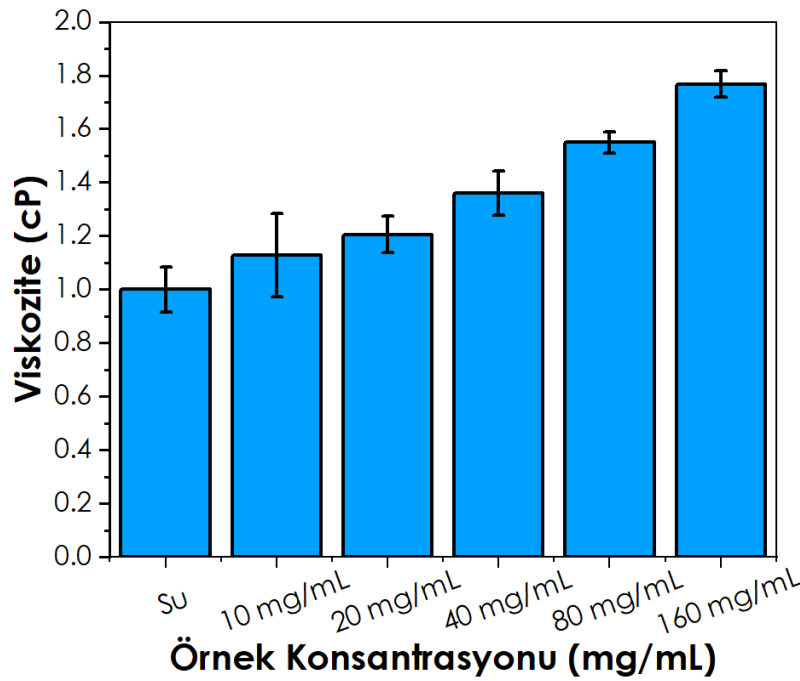
Başlangıç Sap Ağırlık (g)	Toz Ağırlık (g)	Gam Eldesi (g)
150,000	14,854	1,512

Yapılan işlem neticesinde başlangıçtaki sap miktarına göre %1,01 değerinde ve toz ağırlığa göre % 9,82 oranında gam eldesi yapılmıştır. Yapılan çalışma neticesinde kullanılan bölüme göre elde edilen gam miktarlarının literatüre uygun olduğu görülmektedir (Dantas ve diğ., 2021).

Elde edilen bamy gamlarının değişik konsantrasyon değerlerindeki viskozite değerleri hesaplanmıştır (Şekil 2). Deneyler üç tekrarlı olarak yapılmıştır. Hesaplanan viskozite değerleri, Mark-Houwink eşitliğinin çözümünde kullanılmaktadır.

Şekil 2’de belirlenen viskozite değerlerine göre, beklenildiği üzere polimer çözeltilerinde görülen konsantrasyona bağlı bir artış görülmektedir. Hata değerlerinin konsantrasyon arttıkça azaldığı da görülebilmektedir.

Mark-Houwink parametrelerinin hesaplanabilmesi için gerekli Eşitlik 2 ve 3 için gerekli olan verilerin hesaplandığı Tablo 2. aşağıda sunulmuştur.



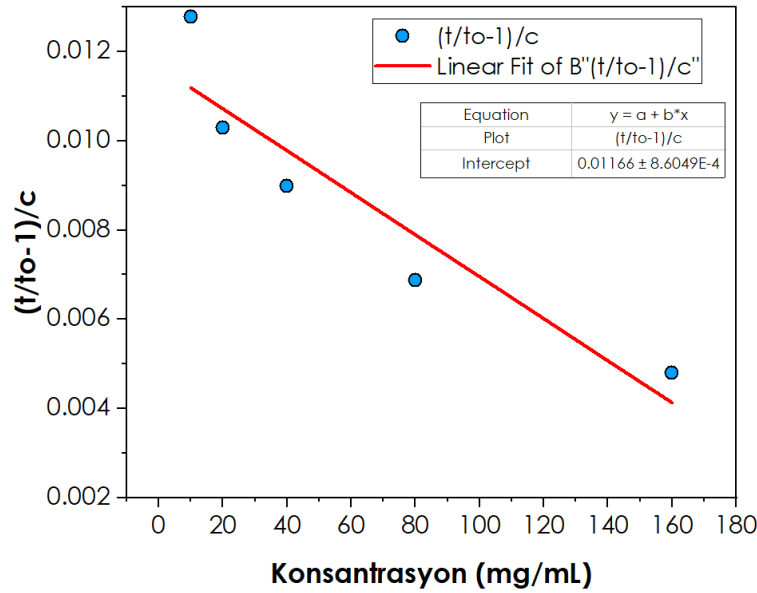
Şekil 2. Örnek konsantrasyonuna göre viskozite değerleri

Tablo 2. Mark-Houwink parametreleri

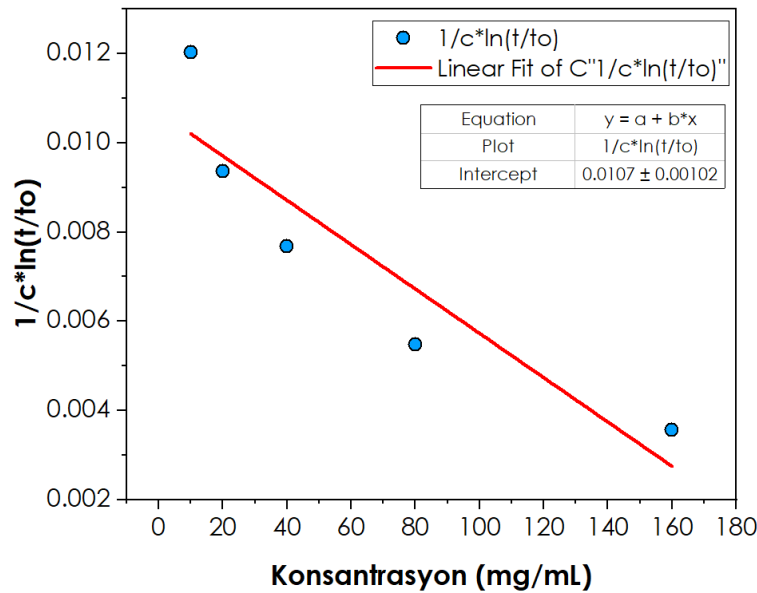
Konsantrasyon (mg/mL)	t/to	(t/to-1)/c	1/c*ln(t/to)
Su	1	--	--
10	1.127801	0.01278	0.012027
20	1.205809	0.01029	0.009358
40	1.359336	0.008983	0.007675
80	1.549378	0.006867	0.005473
160	1.767635	0.004798	0.00356

Tablo 2’de verilen değerler incelendiğinde, konsantrasyona bağlı olarak orantısal viskozite değerinin azaldığı ve logaritmik viskozite değerinin de konsantrasyona bağlı olarak azaldığı görülebilmektedir. Bu veriler ışığında iki değer konsantrasyona bağlı grafikleri çizilerek kayma değerlerinden içsel viskozite değerine geçilebilecektir.

Şekil 3’ te verilen konsantrasyona bağlı Mark-Houwink grafiğinde, değerlerin konsantrasyona bağlı olarak azaldığı görülmektedir. Bu sonuçlar ışığında, kayma verisi incelendiğinde, 0.01166 değeri elde edilmiştir.



Şekil 3. Konsantrasyona bağlı Mark-Houwink grafiği



Şekil 4. Logaritmik konsantrasyona bağlı Mark-Houwink grafiği

Şekil 4’te verilen logaritmik konsantrasyona bağlı Mark-Houwink grafiğinde, değerlerin konsantrasyona bağlı olarak azaldığı görülmektedir. Bu sonuçlar ışığında, kayma verisi incelendiğinde, 0.0107 değeri elde edilmiştir. İki grafikte incelendiğinde, kayma değerlerinin standart sapmalarının düşük olduğu görülebilmektedir. İçsel viskozite değeri, bu ik grafiğin

kesiřtięi noktadaki deęeri olarak alınabilir. Bu iki grafięin kayma deęerlerinin kesiřtięi nokta, eęilim çizgileri uzatılarak elde edildięinde, 0.00112 deęeri elde edilmiřtir. Bu deęerin birim dőnüşümleri yapılarak literatüre uygun olarak verilirse deneyde elde edilen bamyaya gamının içsel viskozite deęeri 11.2 mL/g olarak hesaplanmıřtır.

Mark-Houwink parametrelerinin hesaplanmasında Eřitlik 1 kullanılmaktadır. Burada K ve a deęerleri, elde edilen içsel viskozite deęeri ile kullanıldıęında, çok farklı deęerler elde edilebilmektedir. Yapılan çalışmalarda, ilgili polimerin K ve a deęeri bulunamadıęında, benzer polimerlerin K ve a deęeri kullanılarak ortalama molekül aęırlıęı hesaplanabilmektedir. Yapılan çalışmada ksantam gamının 25 °C’deki verileri kullanılmıřtır (Masuelli, 2014). Yapılan hesaplamada üretilen bamyaya gamlarının ortalama molekül aęırlıęı olarak $9,16 \cdot 10^5$ Da olarak bulunmuřtur. Literatürde yapılan çalışmalarda deęiřik bamyaya bölümlerinin ortalama molekül aęırlıęı deęerleri incelendięinde $2.7 \cdot 10^4$ ile $2.99 \cdot 10^6$ Da arasında deęerler aldıęı görölmektedir (Dantas ve dię., 2021).

TARTIřMA VE SONUÇ

Yapılan çalışmada, atık olarak nitelendirilen bir ürün olan bamyaya meyvesi saplarından ekonomik deęeri yüksek bamyaya gamının üretilmesi amaçlanmıřtır. Elde edilen saplar, çeřitli işlemler ile bamyaya gamı olarak elde edilmiřtir. Elde edilen gam, müslin bez ve süzgeç kâğıdı ile saflařtırılmıřtır. Elde edilen verim deęerlerinden, literatüre uygun deęerler elde edilmiř ve yüksek oranda bamyaya gamı eldesi deęerlerine ulařılmıřtır. Viskozitesi ölçölen bamyaya gamının, konsantrasyonu arttıkça viskozite deęerinin de arttıęı görölmüřtür. Mark-Houwink parametreleri de incelenmiř ve elde edilen bamyaya gamının ortalama molekül aęırlık deęeri hesaplanmıřtır. Hesaplanan deęer, literatür deęerleri ile de kıyaslanmıř ve literatüre uygun bir deęer elde edilmiřtir. Yapılan çalışma kapsamında ilaç salımı, gıda katkı maddesi ve kaplama gibi birçok alanda kullanılabilecek yüksek ortalama molekül aęırlıęına sahip bamyaya gamı eldesi yapılmıřtır. İlerleyen çalışmalarda hidrojel ve polimerik malzemelerin sentezinde kullanılması planlanmaktadır.

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INVESTIGATION OF THE SPATIAL VARIATION OF WATER REPELLENCY IN COTTON AND POLYESTER FABRIC TYPES USING IMAGE CLASSIFICATION METHOD

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ABSTRACT

The image classification process is predominantly used in geosciences (such as agriculture, forestry, etc.) as a significant method. For this purpose, satellite data is classified, and the results are employed as a base map in the creation of maps for soil, forests, and similar applications. Image processing techniques are utilized in various fields, including textile industry for tasks such as detecting fabric quality control errors, measuring yarn densities, and assessing pilling resistance. In the realm of apparel, these techniques are applied for detecting sewing damages. This study focuses on the application of the image classification method to determine the water repellency of fabrics, a significant topic in the textile industry, and to map the spread of water on the fabric. In this context, a fluorocarbon-based finishing agent that imparts water repellency to fabrics was applied to cotton and polyester fabrics at concentrations of 30 g/L and 60 g/L. Subsequently, sample photographs were taken after water repellency tests using the spray method. Water repellency tests were also conducted on reference fabrics without finishing treatment, and sample photographs were taken. After each sample was geo-referenced in QGIS 3.16.2 software, they were classified in Erdas 8.4 software into 20 classes. Two colors were assigned to the wet and dry areas within the classification, each having the same color. Thus, the distinction between wet and dry areas in the samples has been achieved. In the image classification process, after colorizing the photographs of the sample fabrics, the percentage distribution of wet and dry areas was calculated based on the maps created for each sample. Accordingly, for the reference sample of untreated cotton, the wet area ratio was 69%; for the cotton sample treated with finishing agent at a concentration of 30 g/L, it was 22%, and for the cotton sample treated with finishing agent at a concentration of 60 g/L, it was 9%. For the reference sample of untreated polyester, the wet area ratio was 100%; for the polyester sample treated with finishing agent at a concentration of 30 g/L, it was 8%, and for the polyester sample treated with finishing agent at a concentration of 60 g/L, it was 0%. As a result, it has been observed that the image classification method, commonly used in natural sciences, is a viable approach in the textile field to map the water repellency effect created by water repellent finishing applications on different fabric types. The method allows for the detection and proportional assessment of the spread of water repellency. In future studies, the findings

obtained in this research can be further enriched by applying different water repellent finishing agents to various fabric types at varying concentrations.

KEYWORDS: Image classification, Water repellency, Cotton, Polyester, Finishing, Fluorocarbon.

PAMUK VE POLYESTER KUMAŞ TÜRLERİNDE SU İTİCİLİĞİN ALANSAL DEĞİŞİMİNİN GÖRÜNTÜ SINIFLAMA YÖNTEMİ İLE ARAŞTIRILMASI

ÖZET

Görüntü sınıflama işlemi ağırlıklı olarak yer bilimlerinde (tarım, orman vb) kullanılan önemli bir yöntemdir. Bu amaçla uydu verileri sınıflandırılarak toprak, orman vb haritaların çiziminde altlık olarak kullanılmaktadır. Görüntü işleme teknikleri, tekstilde kumaş kalite kontrol hatalarının tespiti, iplik sıklıklarının ve boncuklanma direncinin ölçümü gibi alanlarda, konfeksiyonda ise dikiş hasarlarının tespiti gibi alanlarda kullanılmaktadır. Bu çalışma, görüntü sınıflama yönteminin, tekstil sektöründe önemli bir konu olan kumaşların su iticiliklerinin belirlenmesi ve kumaş üzerinde yayılımlarının haritalanması üzerine yoğunlaşmıştır. Bu çerçevede, kumaşlara su iticilik özelliği veren fluorokarbon esaslı apre maddesi pamuk ve polyester esaslı kumaşlara 30 g/L ve 60 g/L konsantrasyonlarda uygulanmıştır. Ardından püskürtmeli su iticilik test yöntemiyle su iticilik testleri sonrasında numune fotoğrafları alınmıştır. Apre işlemi uygulanmamış referans kumaşların da su iticilik testleri sonrası numune fotoğrafları çekilmiştir. Her numune QGIS 3.16.2 yazılımında koordinatlandırıldıktan sonra, Erdas 8.4 yazılımında 20 sınıf olacak şekilde sınıflandırılmıştır. Sınıflandırmada oluşan ıslak ve kuru alanlara kendi içlerinde aynı renk olacak şekilde iki renk verilmiştir. Böylece, numunelerde ıslak ve kuru alanların ayırt edilebilmeleri sağlanmıştır. Görüntü sınıflama işleminde örnek kumaşlara ait fotoğrafların renklendirilmesinden sonra numuneler üzerinde her bir numune için oluşturulan haritaya dayanarak ıslak ve kuru alanların % dağılımları hesaplanmıştır. Buna göre; apre işlemi uygulanmamış pamuk esaslı referans numunede ıslak alan oranının %69; 30 g/L konsantrasyonda apre uygulanmış pamuk numunede %22 ve 60 g/L konsantrasyonda apre uygulanmış pamuk numunede ise %9 olduğu görülmüştür. Apre işlemi uygulanmamış polyester esaslı referans numunede ıslak alan oranının %100; 30 g/L konsantrasyonda apre uygulanmış polyester numunede %8 ve 60 g/L konsantrasyonda apre uygulanmış polyester numunede ise %0 olduğu tespit edilmiştir. Sonuç olarak; doğa bilimlerinde yaygın olarak kullanılan görüntü sınıflama yönteminin, tekstil alanında farklı kumaş türlerinde su itici apre uygulamasının kumaşlarda yarattığı su iticilik etkisinin haritalanabilir ve yayılımlarının oransal olarak tespit edilebilmesinde kullanılabilir bir yöntem olduğu görülmüştür. İleride yapılacak çalışmalarda farklı su itici apre maddelerinin değişen konsantrasyonlarda farklı cins kumaşlara uygulanmasıyla bu araştırmada elde edilen bulgular daha da zenginleştirilebilir.

ANAHTAR KELİMELEER: Görüntü sınıflama, Su iticilik, Pamuk, Polyester, Apre, Fluorokarbon.

INTEGRATION OF FINITE ELEMENT ANALYSIS AND ARTIFICIAL INTELLIGENCE FOR OPTIMIZING PATIENT-SPECIFIC BIOMECHANICAL IMPLANTS WITH CONSIDERATION OF FATIGUE PERFORMANCE

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ABSTRACT

This study delves into the convergence of two powerful technologies, Finite Element Analysis (FEM) and Artificial Intelligence (AI), to advance the design and optimization of patient-specific biomechanical implants. As medical science progresses towards personalized healthcare, the integration of FEM and AI offers a promising avenue for tailoring biomechanical implants to individual patient needs. This paper explores the synergies and challenges of combining these methodologies to enhance the precision, reliability, and long-term efficacy of orthopedic interventions.

The paper outlines the motivation behind integrating FEM, AI, and fatigue analysis to address the challenges associated with biomechanical implants' long-term durability. It emphasizes the potential for this integrated approach to advance the field, ensuring that implants not only meet immediate biomechanical requirements but also withstand the rigors of long-term cyclic loading, ultimately improving patient outcomes.

FEA simulations are extended to include fatigue analysis, and AI algorithms are adapted to account for fatigue-related parameters, such as cyclic loading and stress concentrations, in the optimization process. By harnessing AI's ability to identify complex patterns and relationships within large datasets, the optimization process becomes more efficient and capable of producing implants that better align with individual patient biomechanics.

KEYWORDS: Finite Element Analysis, Artificial Intelligence, Biomechanics, Fatigue Analysis, Patient-Specific Implants, Personalized Healthcare, Optimization, Orthopedic Engineering.

1. Introduction

With the use of artificial intelligence technology, facilities such as simulation, data analysis, prediction and optimization of the construction process have been provided. One of the advantages of using artificial intelligence in the industrial parts manufacturing industry is to increase the speed of construction and reduce costs. By using smart algorithms, the manufacturing process can be done in a more optimal way. In addition, improving the quality of the manufactured part is another advantage of this technology. By using intelligent methods,

it is possible to more accurately map which part of the project should be completed and also accurately predict project costs. In general, with the introduction of artificial intelligence into the industrial parts manufacturing industry, this industry will significantly improved form. This technology also provides possibilities such as increasing the speed and quality of construction, reducing costs and improving the management of construction projects. With the advancement of technologies related to artificial intelligence, many industries are looking for the applications of this technology in the production of their industrial parts. In this article, the advantages and challenges of using artificial intelligence in the manufacturing industry of industrial parts will be discussed (Markou, 2021).

The integration of AI into 3D FEM analysis represents a transformative leap forward for structural simulations (Javadi, 2009). Through a comprehensive exploration of AI applications in each stage of the simulation workflow, this paper seeks to contribute to the burgeoning field of AI-driven structural engineering, emphasizing the collaborative potential of this symbiotic relationship to redefine the frontiers of structural analysis.

Simulation techniques, especially the Finite Element Method (FEM), have become potent tools for predicting how systems respond in a wide range of industries, including aerospace, automotive, biomedical, chemical processes, and geotechnical engineering. The effectiveness of numerical analysis lies in its capacity to mimic the behavior of actual materials by using idealized counterparts governed by constitutive relationships. In this context, the careful selection of a suitable constitutive model is crucial as it significantly influences the precision and dependability of numerical predictions (Shin, 2001).

Over the recent decades, several researchers have endeavored to employ artificial neural networks (ANN) for the modeling of constitutive material behavior (Ghaboussi, 1991).

This paper presents a new methods approach to constitutive modeling, focusing on the optimization of patient-specific biomechanical implants while considering fatigue performance.

2. Material and Method

Performing Finite Element Analysis (FEA) using artificial intelligence (AI) involves the integration of AI techniques to enhance various aspects of the simulation process. AI can be applied in different stages of the FEA workflow such as Geometry and Meshing, Material Property Assignment, Boundary Conditions and Load Assignment, Solver Optimization, Adaptive Mesh Refinement, Post-Processing and Result Analysis, Model Updating and Calibration, Predictive Maintenance, Knowledge Transfer and Collaboration and Automated Report Generation to improve efficiency, accuracy, and automation (Yu, Qian, 2022).

Integrating AI into FEM optimizes simulations, reducing manual effort, and expediting product development. Tailoring AI techniques to specific simulation needs is crucial for effective integration.

Integrating Finite Element Analysis (FEA) and Artificial Intelligence (AI) for optimizing patient-specific biomechanical implants with consideration of fatigue performance is a cutting-edge approach. This synergy aims to enhance the design and performance of implants by leveraging advanced computational techniques and machine learning algorithms.

The primary objective of this study was to design L type Maxillofacial Implants with a size of 6mm and incorporating four strategically placed holes to enhance their biomechanical properties.

Evolutionary Polynomial Regression (EPR) is a data-driven technique rooted in evolutionary computing, designed to seek polynomial structures that represent a system. The overall expression for EPR can be formulated as follows (Giustolisi, Savic, 2006):

$$(y)=\sum_{j=1}^n F(X, f(X), a_j+a_0 \quad (1)$$

Here, y represents the estimated output vector of the process, a_j is a constant, Fj is a function constructed during the process, X is the matrix of input variables, f is a user-defined function, and n is the number of terms in the target expression.

Python code for L type Maxillofacial Implants with a size of 6mm in boundary conditions and load assignment created. Material properties given in table 1.

Table 1. Material Properties (Osman, Swain, 2015), (Kim, See, 2020)

Material	Modulus of Elasticity (Gpa)	Poisson Ratio	Ultimate Tensile Strength (Mpa)	Density (g/cc)
Ti-6Al-4V	113	0.34	930	4.4



Combining AI with FEM in the context of maxillofacial implants can lead to more accurate simulations, better understanding of implant performance, and potentially improved design and functionality. It's likely that this type of modeling is aimed at advancing the development and optimization of L-type maxillofacial implants for enhanced patient outcomes and safety.

3. Results and Discussion

Figure 2 shows the von Mises stress distribution along the L-type titanium maxillofacial implant.

The results of this review can help to optimize the part design. The location or critical nodes where the probability of crack growth is higher can be checked by von Mises stress analysis. Fatigue failure almost always starts from local discontinuities such as cracks or other areas of stress concentration. When the amount of stress in the place of discontinuity exceeds the elastic limit, plastic strain occurs. In the fatigue failure state, there must be periodic or oscillatory plastic strains. Therefore, we need to investigate and analyze the behavior of the body in periodic or alternating deformation (Biancolini, Brutti, 2003)

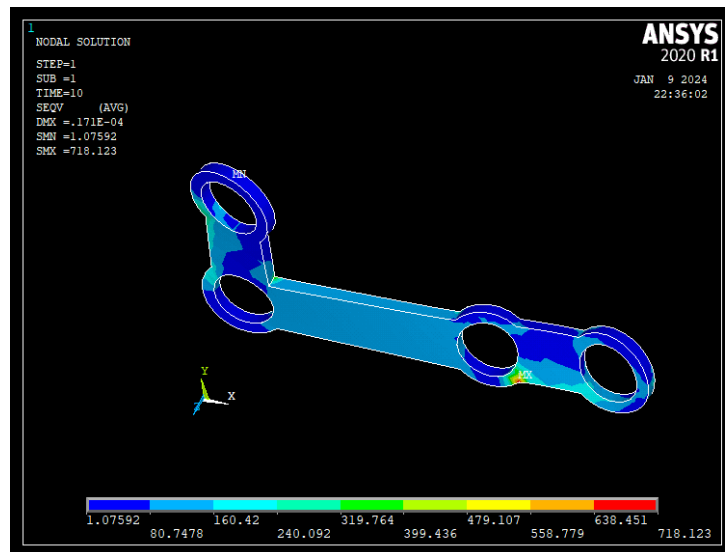


Figure 2. Von Mises Stress Distribution

S-N curve, showing the relationship between stress and fatigue life for the model. This curve use to predict the fatigue life of components under different stress levels. Intrgration of AI with FEM made progress in plate fatigue life. In this research, the fatigue rate of the implant was calculated with Ansys Program Package and its useful life was obtained after 10^8 loadings.

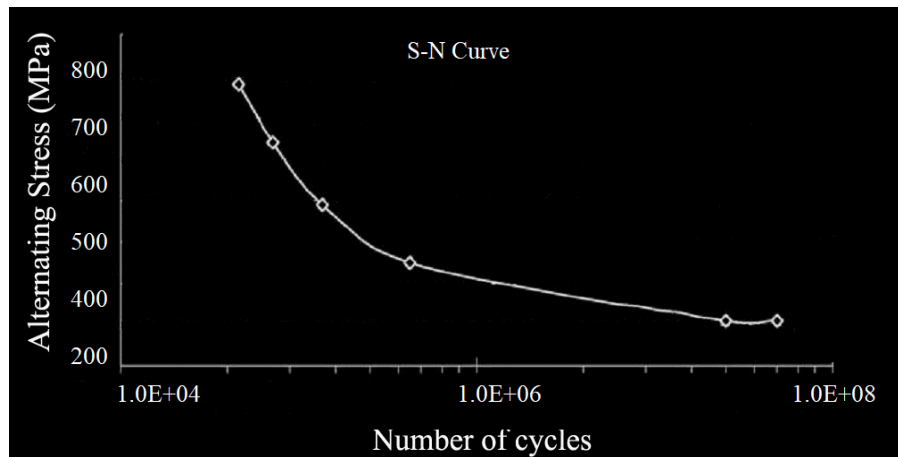


Figure 3. Fatigue Curve

4. Conclusions and Recommendations

The integration of Finite Element Analysis (FEA) with Artificial Intelligence (AI) in the optimization of patient-specific biomechanical implants, particularly emphasizing fatigue performance, marks a transformative leap in medical technology. The synergistic collaboration between these advanced tools has yielded profound insights and tangible benefits for implant design, addressing critical aspects of precision, durability, and patient-centric outcomes.

The amalgamation of FEA and AI has demonstrated its capability to refine implant designs with an unprecedented level of precision. By incorporating patient-specific biomechanical data, this approach ensures a tailored fit that aligns with individual anatomical nuances, minimizing complications, and enhancing overall patient outcomes.

The integration enables a sophisticated exploration of design parameters critical to implant performance. By harnessing AI algorithms alongside FEA simulations, we gain a nuanced understanding of the complex interplay between factors such as geometry, materials, and patient-specific conditions, allowing for optimization beyond conventional boundaries.

The incorporation of fatigue analysis into the optimization process stands as a pioneering achievement. FEA coupled with AI not only predicts potential fatigue failure points but also actively contributes to the development of implants exhibiting heightened durability. This breakthrough significantly extends the functional lifespan of biomechanical implants, addressing a crucial aspect of long-term performance.

Given the dynamic nature of patient health, continuous monitoring and adaptation of implant designs based on real-world performance data should be a key consideration. Implementing feedback loops that allow for iterative improvements will contribute to the ongoing refinement of patient-specific implants and their long-term success in diverse clinical scenarios.

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EXAMINATION OF DETERMINING AND LIMITING ELEMENTS IN ARCHITECTURAL SPACES

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ABSTRACT

The concept of space in the field of architecture; It is defined as "the space that separates the human being from the environment to a certain extent and is suitable for him to continue his actions in it". Space is the protagonist of architecture. Space is a void whose external forms are limited and filled from the inside. In addition to the formal features of the concept of space, it also has features related to human life. While space is formed by the combination of bounding space and limiting elements, it is the structure formed by the existence of the relationships of people living inside or outside. Space is one of the most important elements of architecture. Space is an area formed by structural elements such as stone or wood. One of the turning points in the history of architecture began in the last century when the concept of space was considered as the essential element of architecture. The concept of space, which is the basic subject of architecture, depends on human perception and space limitation, and the concepts of natural, artificial and mixed space are used depending on the differences in the limiting elements.

Within the scope of this article, the place of the concept of space in the architectural sense and the elements of space are discussed. In this context, the determining and limiting elements of the exterior and interior spaces were examined. The meaning of the concept of space with the recently developing technology has been discussed. In this context, the concepts of limited and unlimited space were examined.

As a result of the research, the components and elements that make up the space are divided into limited and unlimited. It distinguishes the exterior and interior spaces from each other through the limiting, directing, focusing, unifying or separating features of the spatial elements. Furthermore, with the developing architectural technology, the area expressed as space has gained a new meaning beyond the need for shelter and shelter.

KEYWORDS: Place, Interior, Outdoor, Architectural Design, Physical Space Items, Perception Of Space.

MİMARİ MEKÂNLARDA BELİRLEYİCİ VE SINIRLAYICI UNSURLARIN İNCELENMESİ

ÖZET

Mimari alanda mekân kavramı; “insanı çevreden belli bir ölçüde ayıran ve içinde eylemlerini sürdürmesine elverişli olan boşluk, boşun” şeklinde tanımlanmaktadır. Mekân mimarlığın başoyuncusudur. Mekân, dış formları sınırlandırılmış, içten doldurulmuş bir boşluktur. Mekân kavramının biçimsel özelliklerinin yanında insan yaşamına ilişkin özellikleri de bulunmaktadır. Mekân, sınırlanan boşlukla, sınırlayan elemanların birleşiminden meydana gelirken, içinde ya da dışında yaşayan insanların ilişkilerinin varlığıyla meydana gelen yapıdır. Mekân mimarinin en önemli öğelerinden birisidir. Mekân taş veya tahta gibi yapı elemanlarının meydana getirdiği bir alandır. Mimarlık tarihinin dönüm noktalarından birisi de son yüzyılda mekân kavramının mimarlığın esas ögesi olarak ele alınmasıyla başlamıştır. Mimarlığın temel konusu olan mekân kavramı, insan algılaması ve mekân sınırlanmasına bağlı olup, sınırlayıcı öğelerin farklılığına göre, doğal, yapay ve karma mekân kavramları kullanılmaktadır.

Bu makale kapsamında mekân kavramının mimari anlamdaki yeri ve mekân öğeleri ele alınmıştır. Bu kapsamda dış ve iç mekânın belirleyici ve sınırlayıcı unsurları incelenmiştir. Son dönemlerde gelişen teknoloji ile mekân kavramının anlamı ele alınmıştır. Bu kapsamda sınırlı ve sınırsız mekân kavramları incelenmiştir.

Araştırmanın neticesinde mekânı meydana getiren bileşen ve öğeler mekânın sınırlı ve sınırsız olarak ayrılmaktadır. Mekân öğelerinin sınırlayıcı, yönlendirici, odaklayıcı, birleştirici ya da ayırıcı özellikleri ile dış ve iç mekânın birbirinden ayırmıştır. Ayrıca gelişen mimari teknoloji ile birlikte mekân olarak ifade edilen alanın sığınma ve barınma ihtiyacının dışında yeni bir anlam kazanmıştır.

ANAHTAR KELİMELE: Mekân, İç Mekân, Dış Mekân, Mimari Tasarım, Fiziksel Mekân Öğeleri, Mekân Algısı.

1. GİRİŞ

Günümüzde hızla artan kentleşmenin yanında mekân kavramı da değişmektedir. İnsanlar birçok farklı mekânlarda gündelik hayatlarını sürdürmektedir. İnsanların hayatlarını sürdürdükleri bu mekânların tasarlanırken, mekânın işlevselliği göz önünde bulundurulmalıdır. Mekânın farklı işlevler kazanması için belirleyici ve sınırlayıcı öğeler bulunmaktadır.

Mimari mekânın belirleyici ve sınırlayıcı öğeleri, mekânın kullanıcıya en iyi hizmeti sunması, kullanımını kolaylaştırması ve güvenli bir ortam oluşturması için iyi bir mekân örgütlenmesi gerekmektedir. Mekânı, kullanıcısının fizyolojik gereksinimi karşılayan sınırlandırılmış bir boşluk olarak tanımlanamaz, mekânlar aynı zamanda kullanıcının psikolojisini de etkilen ve çok çeşitli öğelerden meydana gelen önemli bileşenlerdir (Ertemli, 2018).

Mekânların barınmadan eğitime birçok işlevi bünyesinde sunmaktadır. Dolayısıyla mekânın işlevini belirleyen belirleyici ve sınır öğelerinin tasarımı önem arz etmektedir. Mekânı belirleyici ve sınırlandırıcı öğelerin farklılığına göre mimari mekân ve doğal mekân olarak ayırım yapılmaktadır. Bu öğeler, duvarlar, tavanlar ve döşemeler, sütunlar, kolonlar ve kirişler ise mimari mekânı oluştururlar. Bu öğeler yeryüzü, gökyüzü, ufuk, çalılık, ağaçlar ve bulutlar ise doğanın oluşturduğu, doğal mekânlardır (Altan, 1993).

Bu çalışmada mimari mekânların belirleyici ve sınır öğeleri üzerine yapılmıştır. Mimari mekânları belirleyici ve sınır öğeleri olan duvar, tavan, kiriş, kolon, döşeme, merdiven, pencere

ve kapı elemanları üzerinde bir araştırma ve inceleme yapılmıştır. Bu öğelerin yapı malzemeleri ve mekânın oluşmasındaki belirleyici önemleri incelenmiştir.

2. MİMARİ MEKÂN

Mekân kavramı, insanlık tarihinin bilinen en eski dönemlerinden itibaren, insanoğlunun varlığının en önemli bileşenlerindendir. İnsanın varlığının ve yaşamının sürekli bir ön koşulu olan mekân kavramı, tarihsel süreçte üzerine yapılan incelemeler ve araştırmalar ışığında, farklı dönemlerde ve değişik evrensel ya da kültürel etkenlerle biçimlenen bir kavram olarak karşımıza çıkmaktadır.

Mekân, birçok farklı disiplin tarafından ele alınan ve tartışma konusu olan, kökenleri Antik Yunan'a kadar uzanan bir kavram olarak karşımıza çıkmaktadır. Mekân kelimesi, herhangi bir varlığın şu ya da bu şekilde bir yerde var olması anlamındaki Arapça "kevn" kelimesinden Türkçeye geçmiştir. Bu bağlamda mekân, varlığın herhangi bir formda var olduğu yer anlamı taşımaktadır. Türk Dil Kurumuna göre mekân, "yer, bulunulan yer, ev, yurt, uzay" anlamlarına gelmektedir (sozluk.gov.tr.). Mimarlık disiplini ise mekân "insanı çevreden belli bir ölçüde ayırarak, içinde eylemlerini sürdürmesine elverişli olan boşluk" şeklinde tanımlanmıştır (Hasol, 1998).

Mekân, insan yaşamının her anında karşılıklı etkileşimde olduğumuz, sınırlarını her zaman net bir şekilde çizemediğimiz ve zihnimizde kavramsal olarak var olan mimari bir oluşturmaktır (Yazıcı, 2004). En geniş anlamıyla mekân, insanların içinde var olabildiği, eylemde buluna bildiği kavramsal bir varlıktır. Mekân insan boyutunun içinde var olmasıyla somutlaşan bir oluşumdur (Aydın, 1986, Akt.: Yazıcı, 2004). Başka bir tanımda mekân insanı bulunduğu ortamdan belli sınırlar ile ayıran ve içinde eylemlerini oluşturmaya imkân veren, doğadan veya peyzaj alanından insanın anlamlandırabileceği sınırlı bir alandır (Doğan, 2008).

Mekân tüm algılanabilir özellikleriyle kullanıcıyı kuşatan, algılanabilir özelliklerinin de dışında kalan tüm özellikleriyle kullanıcıyı etkileyen, kullanıcıdan mesajlar veren, zamanla, çevresiyle sürekli etkileşim içinde olan fiziksel bir varlık olup aynı zamanda kavramsal olarak da çeşitli bilim dalları tarafından incelenmiştir (Arayıcı, 2003). Genel anlamda mekân, insanların içinde hareket edebileceği, eylemde bulunabileceği, ya düzlem elemanlarının bir araya gelmesiyle, ya da üç boyutlu kitlelerin oyulmasıyla elde edilen kavramsal bir varlıktır (Aslan ve Ark., 2015).

İnsanın varlığından beri ona eşlik eden bir kavram olan mekân Ching'e göre insanla kesiştiği noktada fiziksel ve algısal sınırlarla kendini mimari mekân olarak var eder (Posta, 2022).

Mekân sürekli olarak varlığımızı sarıp sarmalar. Mekânsal hacim boyunca hareket eder, biçim ve nesneleri görür, sesleri duyar, esintiyi hisseder ve bahçede açan çiçeklerin kokusunu alırız. Mekân, ahşap ve taş gibi maddesel bir öz"dür. Ancak, doğası itibarı ile biçimsizdir. Onun görsel biçimi, ışık kalitesi, boyutları ve ölçeği tamamen toplam biçimin elemanları tarafından tanımlanan sınırlarına bağlıdır. Mekân, kavranıp çevreledikçe ve bir kalıba sokulup biçimsel elemanlar tarafından düzenledikçe, mimarlık varlık kazanır (Ching, 1996; Akt.: Posta, 2022).

Zevi (2015) mimariyi mekân yaratma sanatı olarak tanımlamakta ve sadece mekânsal biçimi ele almayıp, daha çok bütünün mekânsal etkisini düşünmektedir. Bu etki mekânı sınırlayan yüzeylerin organizasyonu, aydınlatma ve hatta sembolik motiflerle belirlenmektedir. Newton'a göre mekânı içinde bulunan cisimlerle karıştırmamak gerekir. İçeriğinden bağımsız olarak mutlak bir mekân, uzay vardır çağdaşı olan Leibniz'e göre karşıt bir görüşle mekân, cisimlerin herhangi bir durumu değil, onların birbirlerini izlemelerine olanak sağlayan durumlar dizisi, bir arada var olabilme olasılıklarının düzenidir, mekân bir varlık değil, ilintidir (Usta, 2020).

Doğa da oluşan çevreler kendi aralarında mekânsal bir bütünlük oluşturarak doğal mekânları oluşturmaktadırlar. Yapay mekânlar da insan eliyle doğal mekânlar içinde sınırlayıcı öğeleri de içererek oluşmuşlardır. Buna göre mekânları doğal ve yapay olarak ayırırsak; insan, ihtiyaçlarına göre doğal mekân şartlarına uyum sağlaması için yapay mekânlar oluşturmuştur. Yapay mekânların insan eliyle tasarlanmasıyla mimari mekânlar oluşmaya başlamıştır. Mimari bir mekân yaratmak, geniş anlamdaki doğadan ya da peyzaj mekânından insanın kavrayabileceği bir bölümü sınırlamaktır (Hasol, 1998).

3. MİMARİ BÜTÜN VE ÖGELERİ

İnsanlar, tarih boyunca barınma ihtiyacı için kendilerini dış etkenlerden koruyacak yapılar inşa etmişlerdi. Bu yapıların en önemli özelliği ise dayanıklı olmasıydı. Eski Romalı ve mühendis Vitruvius'a göre mimarlık, dayanıklılık, uygunluk ve güzellik sağlamalıdır. Dayanıklılık; temelin sağlam olması ve yapı malzemesinin dikkatle seçilmesi, uygunluk; bölümlerin düzeninin kusursuz olması, kullanımda engellerin olmaması ve yapıların türüne uygun doğru cepheleri olması, güzellik ise yapının görünüşünün hoş ve zevkli olması ve eğelerin doğru bakışım ilkelerine göre orantılı olması anlamına gelmektedir (Akt.: Us, 2008).

3.1. Fonsiyon

Mimarinin üç ana ögesi bulunmaktadır. Bunlar; fonksiyon, teknik ve biçimdir. Fonksiyon, “mimari bütünün birimleri arasındaki yapının işlevine göre gerekli, mantıksal, objektif ilişkiler sistemidir.” (Norberg and Schulz, 1965) ve “mimari bütünün, dış çevre ile ilişkilerinin kontrolü ve düzenlenmesi olarak düşünülebilir.” (Aydınlı, 1986) şeklinde tanımlanmaktadır.

Bir bölge üzerinde çalışılan alanı anlamlandırarak, değer katacak şey o mekâna yapılan tasarımın detaylarıdır. Tasarım detaylarında, mekânın işlev sorununun çözümü ve biçimlenmesi, mimari ürünün eser olarak değerini ortaya koyar. Tasarım insanlık tarihinin başlangıcından itibaren insanın ruhsal yapısının düzen ihtiyacını karşılayan biçim yaratma eylemi olmuştur. Toplumsal yapıdaki sosyo-kültürel olaylar ve bilim tekniğinin gelişmesi ile tasarımda biçim oluşumları yeni ifadeler bulur. Mekân tasarımı her zaman yenilik ve değişim gerektiren durumu ile sürekli gelişme halindedir. Mekân tasarımının değerini ortaya koyan en önemli şey içeriğe bağlı kalınıp, onu en iyi biçimle ortaya koyma durumudur (Kagan, 1993).

Yapıtın doğuşunu etkileyen, yönlendiren en geniş anlamda gerçekleştirmenin nedeni olan olgu, gereksinim ve ona bağlı işlevselliktir. Yapı, bir veya birden çok gereksinimi yerine getirmeye çalışır ve ona göre biçimlenir. İyi bir yapının en basitten en önemlisine kadar bütün gereksinimleri karşılamaya çalışması işlevsel bir olgudur. Barınağın işlevi yeterli büyüklükte bir boşluk yaratmak, can güvenliğini ve uygun fiziksel koşulları sağlamaktır. Tüm mimari yapıtlar belli bir amaca yönelik inşa edilmekte, bu da işlevselliği oluşturmaktadır (Us, 2008).

Sonuç olarak yaşanan mimari mekânın bireyleri strese sokmayan ve mutlu eden, insan ruhuna hitap eden bir mimari anlayışla yapılmalıdır. Bu nedenle bilinçli bir şekilde yaşadığımız mekânların mimari çizgilerini de bilmeli ve kendimizin nasıl sağlıklı ve huzurlu olacağımızın bilincinde olmalıyız.

3.2. Teknik

Yapı eyleminde yapıyı oluşturan yapı malzemelerinin, yapı öğelerinin, yapı bölümlerinin, tüm yapının gerçekleştirilmesi, o dönemdeki bilgi, birikim, emek, ekonomi potansiyeline bağlı olan, aletlerin ve kullanıl şekillerini, enerjiyi, üretim sistemini içine alan tüm olgular yapıda teknik olarak tanımlanmaktadır (İzgi, 1999; Us, 2008).

Teknik kavramı öncelikle yapıyı ayakta tutan sistemi içermektedir. Bu sistem yığma, iskelet, karmaşık ya da çağdaş sistemler olarak üçe ayrılmaktadır. Mimari bütünün oluşması “teknik”

ile mümkündür. Teknik, mimari fonksiyonu saran ve örten kabukla, bunları taşıyan sistem olarak tanımlanabilir (Aydınlı, 1986).

Teknolojik gelişmeler ile birlikte mimari alanda da teknikler değişime ve gelişime uğramıştır. Yeni biçim ve strüktür olanakları ortaya çıkmaktadır. Bu yenilikler, yapıda kullanılan malzemelere, o malzemelerin üretim biçimlerine ve ekipmanlarına kadar birçok yönden etki etmektedir. Nitekim ilk dönemler yığma yapılarda kerpiç, taş, tuğla, ahşap gibi malzemeler kullanılırken (Kara, 2009) günümüzde hazır beton ve çelik malzemeler ile farklı yapılar inşa edilmektedir.

3.3. Biçim

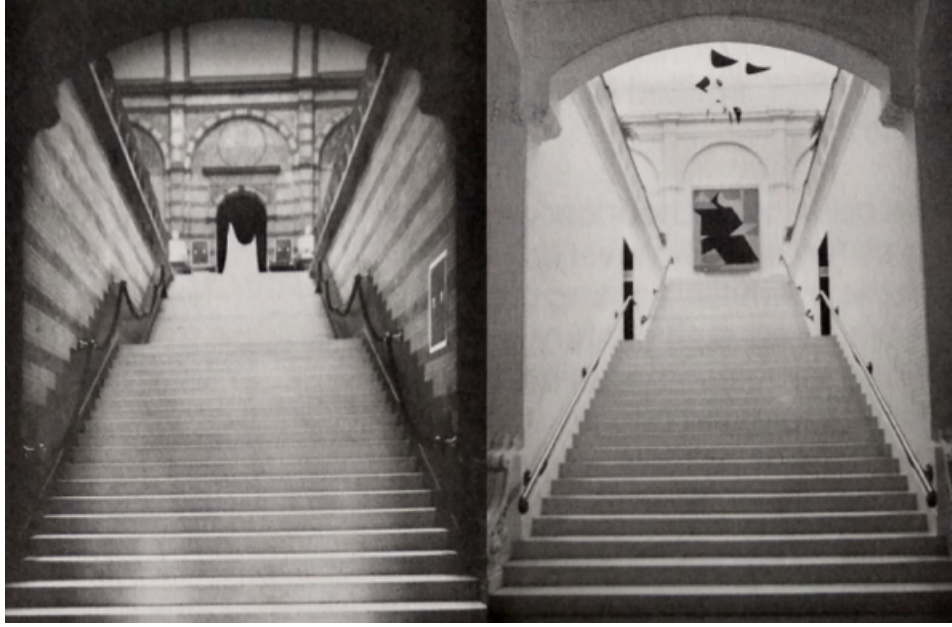
Biçim genel anlamda, nesnelere ayırt edici özellik kazandıran maddi öğelerin kurgusudur (İzgi, 1999). Fonksiyon ve teknik ögesine karşın biçim ögesi, üzerinde en çok düşünsel ögedir. Bunun nedeni bu ögenin diğerlerine göre daha sübjektif görünümde olması ve tanımlanmasındaki zorluktur. Bunun için biçimi kendi içinde elemanlara ayırmak gerekmektedir. Bu ayrım bazı kaynaklarda “Kütle”, “Mekân” ve “Yüzey” olarak yapılmaktadır (Norberg and Schulz, 1995). Bunun yanı sıra biçimin asıl elamanının “Mekân” olduğu ileri süren (Zevi, 1990) veya biçimin “Kütle” olduğunu belirtenler de bulunmaktadır (Aydınlı, 1986).

Mimarlığın temel uğraşı olan mekân tasarımında hedef mimarlık nesnesini biçimlendirmektir (Ersal, 2013). Biçim ve mekân arasındaki ilişkiye değinen Bacon’a (1974) göre kütle ile mekânın temas ettiği noktada biçim meydana gelmektedir. Mimari tasarım faaliyetleri içerisinde biçim, mekânların birlikteliği ile ortaya bir dışsal şekil oluşturulması düşüncesinden fazlasını içermektedir. Norman ve Varver’e (1999) göre biçim kelimesi mimarlık faaliyetleri içerisinde tutarlı bir özellik katan öğelerin birlik ve uyumu demektir (Şekil, 2). Biçim boyut, renk, doku gibi görsel özellik katan öğelerle ve düzenlemenin yerleşim, yönelim gibi özelliklerin bir araya gelmesi ile oluşur. Bu oluşum düzenli ve düzensiz olmak üzere gruplanarak incelenebilmektedir (Ching, 2016).



Şekil 1: 19. Yüzyılda inşası biten Stedeljik Müzesi fotoğrafı. (Kaynak: Yıldız ve Dağgölü, 2021).

Sonuç olarak bir ya da daha fazla eksende simetrik oluşumlar ile düzenli biçimler üretilirken birbirini tekrar etmeyen düzensiz biçimlendirmeler ise genellikle asimetrik ve dinamik yapılandırmalar olarak var olurlar. Düzenli ya da düzensiz olarak tanımlanacak biçimlendirmelere geometrik anlamları dışında farklı anlamlar yüklenmektedir (Demirkaya, 2003).



Şekil 2: Müzenin beyaz küp ile özdeşleşen analarından birinin, 1938 öncesi ve sonrasını gösteren fotoğraf. (Kaynak: Yıldız ve Dağgölü, 2021).

Stedelijk Müzesi'ne ait Şekil;1-2'de fotoğraflarda mimari biçimdeki tüm öğelerin uyum içerisinde kullanıldığı görülmektedir.

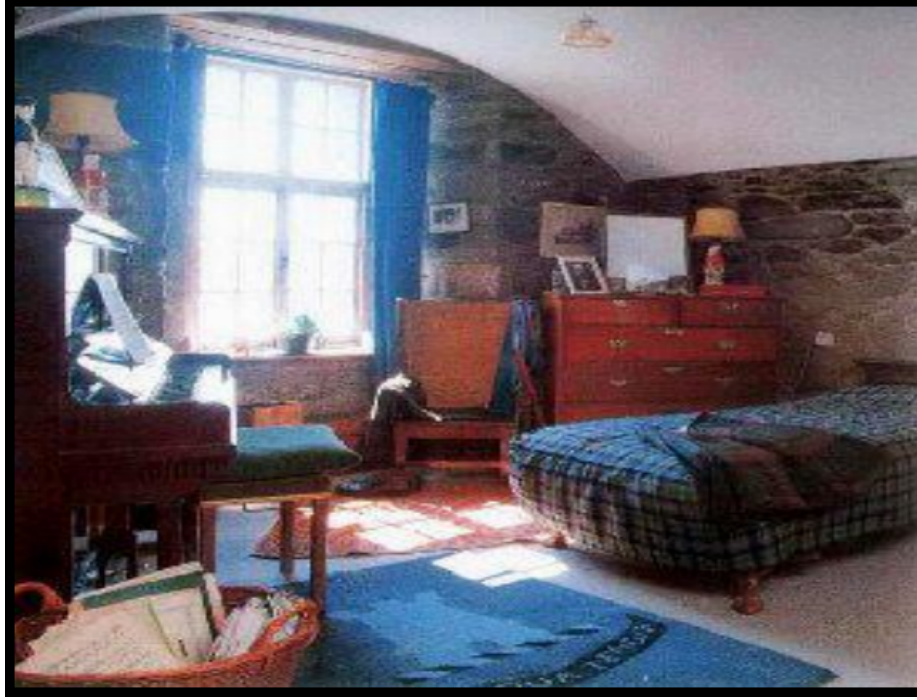
4. MEKÂN BİLEŞEN VE ÖĞELERİ

Mekân bileşenleri yapısal mekân oluştururken ortaya çıkmaktadır. Bunlara yapısal bileşenler de denilmektedir. Yapısal bileşenler sabittir ve genellikle de iç mekânı belirleyici ve sınırlayıcı görevleri bulunur. Mekân öğeleri ise yapısal mekânın oluşmasından sonra mekânda yerlerini almaktadırlar. Kullanıcının gereksinimlerine ve isteklerine göre şekillenen ve çeşitlilik gösteren hareketli elemanlardır. Kompozisyonları mekân bileşenlerine bağlıdır. Mekân bileşenleri ve mekân öğeleri sınırlayıcı görevler üstenebilmektedirler (Özdemir, 1994).

“Mekân” bileşenleri olarak döşeme, duvar, kolon, giriş, çatı, merdiven, mekân öğeleri olarak ise, bölücü duvarlar, pencereler, kapılar, donatılar ve diğer eşya-aksesuarlar saymak mümkündür (Özdemir, 1994). Burada ifade edilen öğeler sınırladıkları bölge kadar önem arz etmektedir. Nitekim sınırladıkları bölgenin mahremiyetinden kamusalılığına kadar bir izi anlam yüklenir. Mekân ve iç mekânlar genellikle kullanıcıların zevk ve tercihleri doğrultusunda farklı donatı veya aksesuar ile kurgulanırlar. Dış mekânlar ise ya doğal, siyasi ve yapısal sınırlarla var olurlar veya işlevsel kargaşanın önlenmesi, bir işlevin diğerini rahatsız etmeden gerçekleşmesi amacıyla bir dünya görüşü ve bilimsel bilgi doğrultusunda planlanırlar (Kurak Açıcı, 2006).

4.1. Mekân Sınırlayıcıları

Mekân bileşen ve öğeleri mekân içindeki sınırlayıcı olarak kullanılabilir. Mekân içinde kendi görevini yapmakta olan donatılar, bunun yanında sınır ögesi olarak da kullanılabilir. Bu donatılara örnek olarak halılar katı bir sınırlayıcıdır. Donatı ve aksesuarlar halının sınırlarına bağlı olarak düzenlenir (Şekil, 3).



Şekil 3: Odanın düzenlenmesinde halı unsuru (Kaynak: Aslan ve Ark. 2015).

Mekânı oluşturan sınırlama, hareketi önleyici şekilde fiziksel olabileceği gibi yalnızca başka duyularla algılanabilecek biçimde, örneğin sadece zemindeki bir doku gibi de olabilir. Önemli olan mekânın net ya da net olmayan sınırlarının algılanabilir olmasıdır (Alan ve Ark, 2015). Mekân sınır öğelerinden koltuklar kendi içinde oturma mekânını oluştururken tek başına kullanılan bir koltuk sınırlayıcı görevi de üstlenebilir. Yaşanılan mekân içinde huzurlu ve güven içinde olunması için sınır öğelerini kullanılmaktadır (Kurak Açı, 2006; Us, 2008).



Şekil 4: Sınırlayıcı öge olarak donatılar ve aksesuarlar. (Aslan ve Ark., 2015).

Şekil 4 incelendiğinde, bir mekânın sınırlandıran öğeleri bir arada görmek mümkündür. Duvarlar, kirişler, cam pencereler, döşemeler, donatılar ve aksesuarlar mekânın tasarımında sınırlama vazifesi görmektedir. Ayrıca görseldeki mekânın tasarlanmasında kullanılan renklerde sınırlayıcı birer öge olarak kullanılmıştır.

4.1.1. Renk ve Doku

Çağdaş bilim ile elde edilen verilere göre renk, elektromanyetik dalgalardan oluşmaktadır. Renk ışığın kendi öz yapısına ve nesneler üzerindeki yayılımına bağlı olarak göz üzerinde yaptığı etkidir (Anon, 1986). Görsel çevrenin renk algılamasını doğurması fiziksel, fizyolojik ve psikolojik olguların birbiriyle bağlantılı olarak meydana gelmesi sonucunda ortaya çıkmaktadır (Aydıntan, 2001). Renk ile ilgili fiziksel algılamının başında ışık gelmektedir. Genel koşullarda renk, ışık olmadan var olamaz. Çünkü renk duyumuna, ışık biçiminde bir enerji neden olur (Aydıntan, 2001).

Renk “ışığın eşya üzerine çarpmasıyla yansıyan ışınların niteliğine göre gözde meydana gelen duyumlardan her biri” olarak tanımlamak mümkündür (Hasol, 1998). Gürer’e (1990) göre renk, bilimsel olarak ışığın dalga uzunluğuna göre gözümüz yolu ile bizde uyandırdığı histir. Renklerin insan ruhunda yaptığı ilk etkinin soğukluk ve sıcaklık etkisi olduğu kanıtlanmıştır. Sarıya yakın renkler sıcak, maviye yakın renkler insana yaklaşır, soğuk etkisi yapanlar uzaklaşır. Arnheim’a göre; sıcak renkler kan basıncını yükseltir, soğuk renkler düşürür. Delacroix ise sıcak renklerden sarı, turuncu ve kırmızı zenginlik, sevinç fikirleri verirler ve temsil ederler, diye söz etmiştir (Kandinsky, 1993).

Belirli bir mekânda renk kullanımı için mekânın soğuk veya sıcak olması, geniş ya da dar görünmesinin istenmesi önem teşkil etmektedir. Renklerle mekâna istenilen etki verilerek mekânın güzelliği artırılabilir. Duvarlarda açık renk kullanılması mekânın görüldüğünden daha büyük algılanmasına neden olmaktadır, mobilya da açık renk kullanılmasıyla da benzer bir etki yaratılabilir (Kalınkara, 2001).

Renk kullanılması mekâna estetik güzellik katmasının yanında mekânı sınırlayıcı özelliği de bulunmaktadır. Yaşam alanında vurgulanmak istenen veya kullanıcıyı yönlendirmek istenen durumlarda renkler önemli unsurlardır. Örneğin mekân içerisinde fark edilmesi istenen bir duvar ya da yüzeyin veyahut eşyanın farklı renklerde ön plana çıkarılması o alanın renklerle sınırlanması anlamına gelmektedir (Şekil, 5).



Şekil 5: Farklı Renklerin kullanımı (Kaynak: Uyan, 2023).

Şekil 5’te görüldüğü üzere “Yeni nesil Öğrenci Yurtları” projesi kapsamında mekân kullanıcıların dikkatlerini çekecek renklerle oturma alanları ve bina sınırlayıcı unsunu olan duvar, tavan ve kolonlar renklendirilerek dikkat çekici hale getirilmiştir. Canlı renkler genellikle duvarlarda, mobilyalarda ya da aksesuarlarda kullanılmıştır. Tavanda ve zeminde genellikle monokrom renkler kullanılmıştır.

Mekân sınırlayıcı unsurlardan birisi de mekânın sahip olduğu dokulardır. Doku, “Bir yüzeyde, dokunma duyusuna hitap eden nitelikler, tekstür”, “Bir gerecin içyapısının yani bünyesinin karakteristiği: lifli, taneli, gözenekli” anlamlarına gelmektedir (Hasol, 1998).

Doku, bir yüzeyin ince yapısıdır ve malzemenin fiziksel özelliklerini tanımlamaktadır. Malzeme, mimariye dokusu ile katılmaktadır. Bir nesnenin katı veya sıvı, sert veya yumuşak, pürüzlü veya düzgün dokusu kullanıcı tarafından genelde doğru olarak algılanmaktadır. Pürüzlü bir dokuya sahip yüzeyin sıcak bir etki yaratırken, düz bir yüzeyin soğuk etki yarattığı deneysel çalışmalarla ispatlanmıştır (Ertürk, 1984, Yener, 2000).



Şekil 6: Ağaç kabuğu dokusu



Şekil 7: Taş Dokusu

Dokular doğal ve yapay olarak iki kısma ayrılır. Ayrıca sert dokular (ahşap ve taş gibi), orta sert dokular (cam) ve yumuşak dokular (kumaş) olarak üç kısma ayrılmaktadır. Dokular görsel algı açısından etkili olmaktadır. Dokunun etkili olmasının önemli etkenleri; dokunun bizzat kendisi, dokulu malzemenin rengi ve dokulu yüzeyin parlaklık derecesidir. Sert dokulu cisimler olduklarından yakın görünürken yumuşak dokulu cisimler de olduklarından daha uzak

görünürler (Şekil, 6). Bu da dokunun psikolojik etkilerinin olduğunun bir göstergesidir (Kurak Açıcı, 2006).

4.2.Mekân Sınırlayıcı Olarak Kullanılan Mekân Bileşenleri

Mekân bileşenler, mekân içinde kendi görevlerinin yanı sıra mekânları birbirinden ayırarak sınırlayıcı rolleri bulunur. Böylece mekân bileşenleri çok amaçlı olarak kullanılır ve iç mekâna oldukça önemli katkı sağlar.

4.2.1. Döşeme

Mimari bir öge olarak döşeme, “yapılarda katları birbirinden ayıran düzlemsel yüzey ve bu yüzeyin üst yüzü” şeklinde tanımlanmaktadır (Sözen ve Tanyeli, 1994). Başka bir tanıma göre ise “yapılarda katları birbirinden ayıran ve üzerinde yürünen kısım” şeklinde tanımlanmıştır (Hasol, 1998). Tanımda üzerinde yürünen taban yüzeyi döşeme için kullanılmıştır. Tabanda bulunan parke, karo, seramik, mozaik, halı gibi birer döşemeyi kaplayan malzemelerdir.

Döşemeler, kapalı veya açık hacimlerin üstünü örtmek için kullanılan, yapının katlarını birbirinden ayıran yapının düşey ve yatay yüklerini taşıyan yapı elemanıdır. Döşemeler üzerine gelen yükleri ve kendine ait ağırlığından kaynaklanan yükleri doğrudan taşıyıcı duvarlara aktarırlar (Kara, 2009).

Yer döşemeleri bir yapının inşa ve dekorasyon aşamasında oldukça önem arz etmektedir. Döşeme bir katın tabanı iken diğer katın tavanı vazifesi görmektedir. Bir mekânın tabanı olarak döşemeler çeşitli kaplama malzemeleri kullanılarak mekânın dizayn edilmesinde önemli rol oynamaktadır. Faulker (1979), “soğuktan ve toprağın neminden koruma” ve “yürüme ve mobilya yerleştirme için düzgün bir yüzey sağlama” gibi iki temel fonksiyonu olan düz yatay yüzeyler yer döşemesidir. Döşemeler dört kısımda incelenir. Bunlar yumuşak, sert, pürüzsüz veya esnek ve biçimlendirilmiş ya da döküm yüzeylerdir.

Yumuşak döşemeler: halılar ve kilimlerdir (Şekil, 8).



Şekil 8: Kilim fotoğrafı (Kaynak: URL 1).

Yer döşemesi olarak kullanılan halı ve kilimler yün ve yapay liflerden oluşmaktadır. Halı ve kilimler yer döşemelerinin yanında duvar halı ve kilimleri olarak duvar kaplaması olarak kullanılmaktadır.

Sert döşemeler: ahşap, seramik, mozaik, doğal taş cam parke, mermer gibi (Şekil, 9).



Şekil 9: Ahşap taban döşemesi (Kaynak: URL 2).

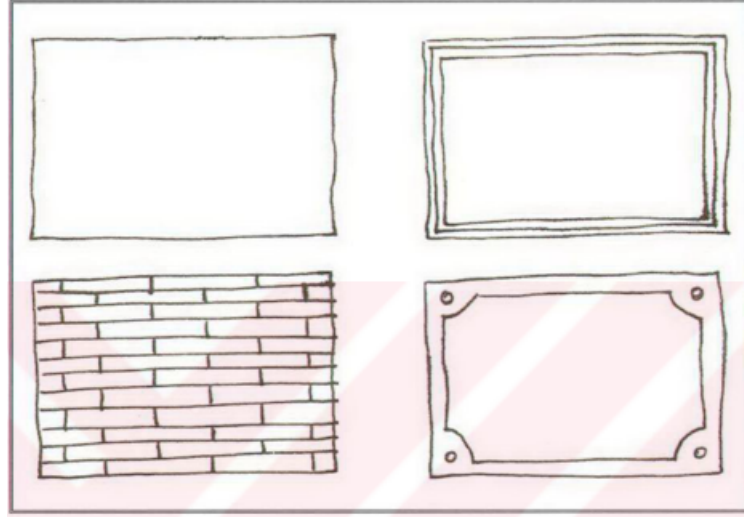
Şekil 9’da görüldüğü üzere yer döşemesinde kullanılan malzeme ile mekânın sınırları çizilmiştir. Bu da döşeme ögesinin sınırlayıcı özelliğini göstermektedir.

Düz (Esnek) yüzeyli malzemeler, vinil mantar, vinil aspest, epoksi ve linolyumdur.



Şekil 10: Epoksi malzemeden yer döşemesi (Kaynak: URL 2).

Biçimlendirilmiş ya da döküm yer döşemeleri (Şekil, 11).



Şekil 11: Döşeme üzerindeki sınırlılık etkisi. (Kurak Açıcı, 2006).

Mimari mekânda yer döşemeleri tasarımın odak noktasıdır. Nitekim tasarım döşemenin etrafında ve onun görselliği üzerine dizayn edilmektedir. Özellikle halı ve bazı yer döşemelerinin sıcaklığı koruması, odanın fonksiyonuna ve burada yürütülecek eylemlere uygun nitelikler sunmasından döşeme malzemesi olarak tercih edilmektedir. Bunun yanında kullanım alanlarına göre zemin kalıcı ve daha yoğun kullanıldığı alanlarda (Ofis, Okul, Hastane gibi) sert malzemeler tercih edilmektedir. Bunların yanında günümüzde birçok mekânda ahşap malzemeler tercih edilmektedir. Tarih boyunca da geleneksel olarak yer döşemelerinden ahşap tercih edilmiştir.



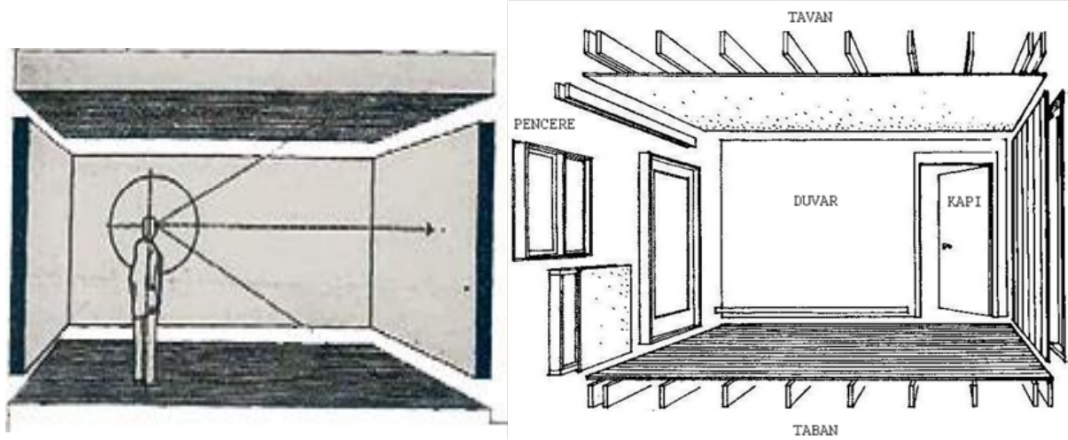
Şekil 12: Ahşap parka yer döşemesi (URL: 2).

Şekil 12’de günümüzde özellikle konutlarda tercih edilen parkeler önemli yer döşemesi olarak kullanılmaktadır. Hep ahşap olması hem de kolay işlenir olması daha çok tercih edilmektedir.

4.2.2. Duvar

Mimari sınırlayıcı öğelerden en önemlilerinden birisi duvarlardır. Duvarlar en belirleyici unsur olmalarından dolayı birçok tanım yapılmıştır. Duvar “Yapılarda genellikle taşıyıcı işlevi de bulunan bölme elemanı” şeklinde tanımlanmaktadır (Sözen ve Tanyeli, 1994). Başka bir tanıma göre “Yapılarda taş, tuğla, briket, kerpiç ve benzeri gereçlerle yapılan düşey bölme öğesi” olarak tanımlanmıştır (Hasol, 1998).

Duvarlar, ortamları ya da mekânları birbirinden ayıran, düşey ya da düşeye yakın yapı elemanlarıdır. Yapılarda mekânlarını birbirinden ayırmasının yanında, sadece bir kat yüksekliğinde, taşıyıcı olmayan ve genelde ağırlığı üzerinde oturduğu döşeme tarafından taşınan, hafif malzemeden yapılan duvarlara bölme duvarları denir. Bölme duvarlar yapıların iç mekânlarını bölme görevi üstlenmektedir (Toydemir ve Ark., 2000).



Şekil 13: Mekân sınırlayıcı öğelerinden duvar ve görsel algıları (Kaynak: Ertemli, 2018).

Duvarların mekânlardaki rolü ve fonksiyonu zamanla değişikliğe uğramıştır. İlk ve en önemli fonksiyonu koruma durumu giderek değişmiş, daha az sayıda mobilya için dekoratif bir fon haline gelmiştir. Günümüzde duvarlar iç mekân dizaynlarında daha fazla kullanılmaktadır. İç mekânlarda duvarlar, duvar dolapları ve küçük dolaplarla depolama fonksiyonuna aracı olurlar. Duvarlar, yerleşik kitaplıklar, oturma yerler ve tezgâh alanı ile mobilya ve aksesuar fonksiyonu oluşturlar (Kurak Açıcı, 2006).

Düşey mekân sınırlayıcı öğeler, yatay sınırlayıcı öğelerden olan zemin ve tavana göre daha farklı bir konumdadır. Mekânı tanımlamanın yanında, iç il dış mekân ilişkisini ve mekânın karakterini belirleyen en önemli bileşen olarak kabul edilirler. Mekânda işlevlerine göre farklı şekillerde ve konumlarda bulunabilir, mekânı tanımlamada ve görsel algı oluşturmada etkili bir rol üstlenirler (Ertemli, 2018).

Mekânı sınırlayan yüzey olan duvarlar düşey yöneliminden dolayı, görsel olarak en etkili yüzeylerdir. Kullanıcı tarafından en önce ve en uzun süreli algılanırlar. Derinliği, yerden olan yüksekliği, şeffaf veya opak oluşuyla, rengiyle ve formuyla, tasarımı fiziksel ortama aktaran güçlü bir öğedir ve bu özellikleriyle kullanıcıların psikolojisini de kolaylıkla etkilerler. Duvar yüzeyinin konumu ve boyutları ile duvardaki doluluk boşluk oranı, mekânın karakteristik özelliklerini oluşturan etkenlerdir (Şekil, 19) (Meiss, 1991; Ertemli, 2018).

Duvarların oda içinde büyük ya da küçük olmaları oransızlık yaratmaktadır. Çok uzun bir duvar başka bir yarım bölücü duvar ile kesilerek oturma alanı oluşturulabilir. Çok yüksek bir duvarı farklı bir aydınlatma ile keserek yüksek olmadığı izlenimi verilebilir.



Şekil 14: Mevcut ana duvarlardan hariç daha kısa bir duvar kullanarak sınırlandırılmış mekân. (Url 3).

Duvarlar alanı çevirmekten çok bölme işlevi görmektedirler. Mekân içindeki kullanıcıları engellemeksizin bir odadaki eylemleri ayırır ya da doğrudan göz önünde olmasını engeller ve mekân içinde birçok eylemin gerçekleşmesine imkân sağlar. Duvarlar, üzerlerine bir şeyler asıldığında veya önlerine bir şey yerleştirildiğinde mekân içinde pasif kalır ve sadece arka fon olarak görev yaparlar. Duvarları aktif hale getirmek için renginde ve dokusunda değişiklikler yapılabilir. Duvarlar sert yüzeylidir. Duvarlara uygulanan üst yüzey malzemelerle daha dayanıklı ve ilgi çekici hale getirilebilir. Duvar yüzeylerinde yaygın olarak kullanılan malzemeler boya, alçı, seramik, lambiri ve duvar kâğıdıdır (Şekil, 15).



Şekil 15: duvar kâğıdı uygulaması (Kaynak, URL 4).

Duvarlar, sınırlayıcı ve çevreleyici özelliği ile mahremiyet, güven duygusu yaratmanın yanı sıra, engelleme, aşılmazlık, korku özgürlüğün kısıtlanması gibi etkenlerden de söz etmek mümkündür (İzgi, 199). Mekânın geometrisini oluşturan mekân sınırlayıcılarının yüzeylerinin, biçim, doku ve renkleri ile mekânda bulunan insanların yaşam, biçim ve etkinliklerine olarak veren donatım elemanlarının nitelik, yoğunluk, görünimleri ve düzenlenişleri de mekânın

niteliğinin oluşmasında etkindir. Fonksiyon ve estetik açıdan değer ne olursa olsun, mekânların insan üzerindeki etkisi değişiktir. Aynı mekân içerisinde bulunan insanlar o mekândan etkilenmeleri ve bunun sonucunda gösterdikleri tepki de farklı olabilir (Ertemli, 2018).

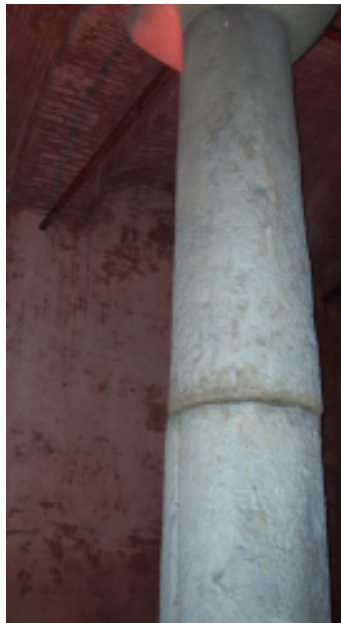
4.2.3. Kolon

Mimari alanda kolon “Betonerme ya da çelikten yapılmış, düşey, taşıyıcı strüktürel öge” ve “taş ya da mermerden yapılmış sütun” şeklinde tanımlanır (Sözen ve Yanyeli, 1994). Başka bir tanımda ise kolon “Uzunluğu doğrultusunda paralel kuvvetlerin etkisi altındaki çubuk, sütun” şeklinde tarif edilmiştir. Kolonlar, giriş ya da döşemelerden gelen etkileri öteki kolonlara ya da temellere aktaran genellikle düşey taşıyıcı öğelerdir. Kolon kelimesi genelde betonarme sütunlar için kullanılmaktadır (Hasol, 198).

Kolonlar diğer bir ifadeyle sütunlar yekpare bir malzeme ile ya da birkaç blok taşın üst üste dizilmesi ile oluşturulan düşey taşıyıcı elemanlardır (Şekil, 16, 17). Kolonları oluşturan elemanların birleşim yerlerinde çelik ya da ahşaptan yapılmış bilezik çeklindeki halkalar bulunur. Örtü sisteminden gelen yüklerin düşey taşıyıcı sütunlarla birleşme bölgesinde sütun başlıkları ve yükün zemine aktarıldığı yerde sütun tabanı bulunmaktadır (Kara, 2009).



Şekil 16: Sütunlu yapı örneği Artemis Tapınağı Efes. (Kaynak: Kara, 2009).

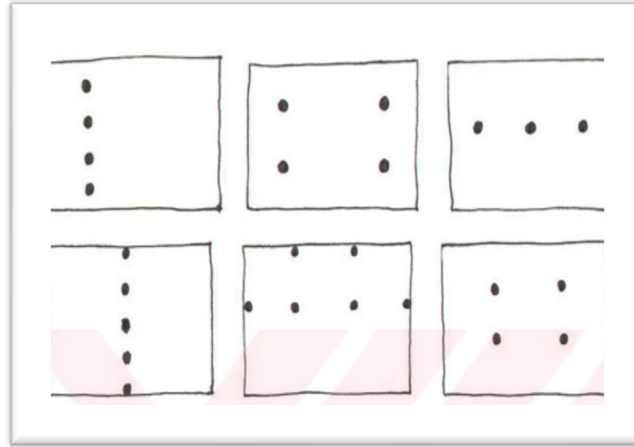


Şekil 17: Parçalı sütun örneği Yerebatan Sarnıcı İstanbul (Kaynak: Kara, 2009).

Kolonlar, kendi işlevi dışında mekâna estetik bir değer de katmaktadır. Ayrıca kolonlar mekânları birbirinden ayırarak, mekân içinde sınırlayıcı görevler de üstlenmektedir (Şekil, 18, 19).



Şekil 18: Sergi alanları ve kolon bölmeleri (Kaynak: Taşkın ve Erman, 2021).



Şekil 19: Plan düzleminde kolonların sınırlayıcı etkisi (Kaynak Heuser, 1989).

Birçok dış ve iç mekânın görkemli ya da sade kolonlar kullanılarak mekâna estetik görüntü verilmiştir. Tarihsel süreçte neredeyse her yapının ana taşıyıcıları olarak kullanılmıştır.

4.2.4. Kiriş

Mimari alanda kiriş “Döşeme veya tavanı taşıyan ahşap, metal veya betonarmeden yapılmış yatay inşaat elemanı” olarak tanımlanmaktadır (Sözen ve Tanyeli, 1994). Başka bir tanımda ise “Boyu doğrultusundaki eksenine dik kuvvetlerin etkisi altında bulunan çubuk; döşemeden gelen yükleri düşey taşıyıcılara aktaran, eğilmeye dayanıklı strüktür ögesidir.” (Hasol, 1998).

Duvarlar ve kolonlarda olduğu gibi kirişlerde mekânlar arasında ayırıcı görev üstlenmektedir. Özellikle yaşam alanlarında oturma ve yemek bölümlerini üçüncü boyutta birbirinden ayıran bir sınır ögesidir (Kurak Açıcı, 2006). İç mekân oluşmasında etkili olan kirişler mekânda yönlendirici, sınırlayıcı ve odaklayıcı olabilmektedir. Kirişler mekanlar arası geçişleri sağlamak ve mekânları birbiriyle iletişimi kurmada etkili olmaktadır (Şekil, 20).



Şekil 20: Mekânların giriş yardımıyla sınırlandırılması (Kaynak: Kurak Açıcı, 2006).

4.2.5. Merdiven

Mimari alanda merdivenler “Farklı kottaki iki düzlemi birleştiren basamaklı yapı ögesi” şeklinde tanımlanmaktadır (Sözen ve Tanyeli, 1994). Başka bir tanımda ise “Yukarıya, yükseğe çıkmak için yapılan yol” şeklinde tanımlanmıştır (Hasol, 1998).

Merdivenler iki duvar arasından yükselebildiği (Şekil 21) gibi bir kenarından duvarla sınırlı (Şekil, 22) veya duvardan büsbütün bağımsız (Şekil, 22) olarak tasarlanabilirler.



Şekil 21: İki duvar arası merdiven basamakları (Kaynak: URL 6).



Şekil 22: Bir tarafı duvara merdiven basamakları (Kaynak: URL 5).



Şekil 23: Bağımsız merdiven basamakları (Kaynak: URL 6).

Merdivenler asırlardır taş ve ahşap sistemlerden gelişerek günümüzde beton ve çelik malzemeler başta olmak üzere farklı dizaynlarda mimari yapılarda yer almaktadır.

4.2.6. Pencere

Mimari alanda pençeler “Bir iç mekâna ışık ve hava vermek için yapılmış açıklık veya delik” olarak tanımlanmaktadır (Sözen ve Tanyeli, 1994). Başka bir tanıma göre “Dışarısını görmek, hava ve ışık almak için duvarlarda yapılan ve doğrama ile camdan meydana gelen açma”dır (Hasol, 1998).

Mimari mekânlarda pencereler büyük önem arz etmektedir. Pencereler insanın gözleriyle dışarıyı seyretmesi gibi konutlarda pencereler ile dışarıyı seyretmektedir. Pencereler, yapıya kişilik ve stil kazandırmalarının yanı sıra, konutun dış dünyaya açılan bir niteliği olarak önem taşımaktadır. Pencereler iç mekâna hava, ışık ve manzara girmesine imkân sağlar (Şekil, 24) (Kalinkara, 2001).



Şekil 24: İç mekândan pencere görüntüsü (Kaynak: URL 7).

Mekânlar ister istemez pençelerin etkisi ile düzenlenmektedir. İö mekânı örgütlemeye sınırlılık sağlamaktadırlar. İç mekân pencerelerin varlığını kabul ederek ve manzaraya veya doğal ışığa yönelerek örgütlenmektedir. Pencerelerin boyutları, şekilleri ve yerleşimleri mekân örgütlenmesinde sınırlayıcı olmaktadır (Kurak Açıcı, 2006).

4.2.7. Kapı

Mimari alanda kapı “Bir mekâna giriş çıkış için kullanılan açıklık” şeklinde tanımlanmaktadır (Sözen ve Tanyeli, 1994). Başka bir tanımda ise “Bir yere girip çıkarken geçilen ve açılma düzeni olan duvar ya da bölme boşluğudur” şeklinde tarif edilmiştir (Hasol, 1998). Kapılar yapı itibari ile bir kanat ve kasadan meydana gelmektedir. Kapılar ışık, ses, koku, rüzgâr, sıcak-soğuk ve konuta giriş çıkış ile bir odadan diğerine geçişi saplar ve sirkülasyonu kontrol ederler ve mimari yapının bir parçasıdır. Kapılar, ağır, ahşaptan yapılmış iki tarafa açılır ve kapanır şekilde, ahşap, bambu ya da dokuma materyalden yapılmış katlanabilir şekilde ya da şeffaf camdan sürgülü (Şekil, 25) tipte tasarlanmıştır (Kurak Açıcı, 2006).



Şekil 25: Cam sürgülü kapı (Kaynak: URL 8).

Kapıların mekân örgütlenmesinde önemli etkileri bulunur. Kapının rengi, modeli hangi mekâna açıldığı ve mekân içinde etkisi önemlidir. Kapı mekânın etkili bir ögesi olarak tasarlanabileceği gibi varlığı ile yokluğu ayırt edilemeyecek bir şekilde de dizayn edilebilmektedir. Kapının mekân da nasıl olması isteniyorsa örgütlenme de ona göre yapılmalıdır. Yaşama mekânı ile mutfakı birbirinden ayırmada sürgülü kapı başarı sağlamakta, oda kapıları ise kanatlı olması odaların özel kullanımına imkân sağlamaktadır (Kurak Açıcı, 2006).

SONUÇ

Mekân, mimarinin ana ögesidir. Tarih boyunca insanlar başta barınma olmak üzere, yaşam alanlarını genellikle açık ve kapalı mekânlarda geçirmiştir. Bu sebeple mekânın belirleyici ve sınırlayıcı öğeleri mimari anlamda önem arz etmektedir.

Mekân, yatma, barınma, çalışma, yaşama, yeme-içme ve dinlenme gibi işlevleri bulunmaktadır. bu ihtiyaçlardan bazılarını aynı anda gerçekleştirmek isteyen insan mekân anlayışında zamanla değişiklikler yaparak yeni yapılar oluşturmuştur. Öncelikle dış dünyadan soyutlamam için mekânı belirleyici ve sınırlarını belirleyecek öğeler inşa etmişlerdir.

Mekân denildiğinde üstü ve dört tarafı kapalı yaşam alanları akla gelmektedir. Ancak bazı mekânlar işlevleri bakımından daha geniş ve farklı mimari tekniklerle inşa edilmiştir. İnsan mekânı kullanım alanlarına göre örgütlemiştir. Bu örgütlemeyi gerçekleştirirken de döşeme, duvar, kolon, kiriş, merdiven, pencere ve kapı gibi sınırlayıcı mekân bileşenleri ile gerçekleştirmiştir.

Teknolojik gelişmelerle birlikte mimari alanda gerçekleşen yenilikler ve gelişmelerle yapılar farklı anlam kazanmıştır. Bununla birlikte mekân bileşenler de artık tek anlam ifade etmemektedir. Yapıda bulunan bir pencere artık sadece ışık ve hava girmesi için değil yapıya mimari estetik kazandırmak amacıyla tasarlanmıştır. Aynı şekil döşemeler ve duvar renkleri, dokuları ile birçok mimari estetik içermektedir. Renkler ve inşa malzemeleri ile yapının mimari

manalar vermesi sağlanmıştır. Bunun yanında yapının ana gövdesini oluşturan kolan ve giriş gibi yapılar da estetik özellikler barındırmaktadır.

Çalışmamızda ele aldığımız bu mekân bileşenler ve sınır öğelerinin tamamı, mekânın belirlenmesinde ve örgütlenmesinde önemli roller oynamaktadır. Bir yapıyı diğer yapıdan ayıran, odaları odalardan ayıran, mutfak ile salon, salon ile yatma odasını birbirinden ayıran, alt kat ile üst katı birbirinden ayıran, sınırlandıran hatta birleştiren ya da geçişi sağlayan mekân bileşenleridir.

Sonuç olarak mimari alanda her taş parçasının dahi bir estetiği söz konusudur. Yeter doğru manada ve yerde kullanılsın. Yapıda sadece dışarıdan koruyucu özelliği ile ön plana çıkan duvarlar, döşemeler, tavan, kolonlar, girişler, merdivenler, pencere ve kapılar mimari mekânların en önemli estetik unsurları ve sınırlandırıcılarıdır.

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**THE PREPARATION AND CHARACTERIZATIONS OF BIODEGRADABLE POLY
(BUTYLENE SUCCINATE) (PBS) AND SODIUM CASEINATE (NACAS) BLENDS
FOR PACKAGING APPLICATIONS****Mümine Yıldır****Bedriye Ucpinar Durmaz****Ayse Aytac**

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<https://orcid.org/0009-0004-3121-894X>Dr., <https://orcid.org/0000-0002-4446-6086>Prof. Dr., <https://orcid.org/0000-0002-9566-7881>**ABSTRACT**

Food packaging provides the physical, chemical, or biological protection of food while allowing product commercialization and distribution. Plastics derived from petroleum-based polymers are one of the most used materials in food packaging. This means the food packaging industry strongly depends on the petrochemical non-biodegradable polymers. Their main advantages are wide applications, convenience, low prices, and durability. However, in recent years, food packaging has focused on two scientific pillars: adopting biodegradable packaging materials and development of antimicrobial packaging for extended shelf life, quality, and safety of food products. The bioplastic materials have gained worldwide attention both in fundamental research and industrial technologies. A variety of biodegradable polymers have been tested, such as poly (lactic acid), polyhydroxyalkanoates, poly(caprolactone), poly(butylene adipate-co-butylene terephthalate), and poly(butylene succinate) (PBS). PBS has great potential for commercial applications because of its biodegradability, thermal stability, low melting point, relatively easy processability in industrial-scale manufacturing and chemical resistance among the biodegradable aliphatic polyesters. In recent years, many attempts have been focused on developing PBS-based blends and composites with lower cost, improved mechanical, thermal, and gas-barrier properties. Hence, this study aimed to develop a biodegradable edible film incorporated with Sodium caseinate (NaCas). NaCas is a commercially available protein obtained from milk. Its ability to present good film formation, non-toxicity, bind small molecules and ions are remarkable. Considering their biodegradability and good technical properties (high barrier for gases like O₂), caseinate-based films can find many applications area. Another benefit of NaCas is being cheap. In this study, blended films PBS and different concentrations of NaCas (10, 20, and 30 wt.%) were prepared by the extrusion and hot-pressing method, and their mechanical, thermal, and structural properties were investigated. The preparation of biodegradable active packaging materials is still a major challenge. Therefore, the fabrication and characterization of PBS-based films with milk protein-NaCas were reported in this study. The tensile strength and elongation at break values of the film samples are given by taking the average value. The tensile strength of the blended films has decreased with the increased NaCas amount. The 70 PBS/30 NaCas blend showed the lowest tensile strength (6,74 Mpa) of all film samples. Crystallinity values increased with enhancing NaCas content. Besides, it was observed that the percentage of char residue increased with the increasing NaCas ratio for all matrices.

KEYWORDS: packaging films; poly (butylene succinate) (PBS); sodium caseinate (NaCas); biodegradable packaging.

INTRODUCTION

Plastics are one of the most used materials in food packaging and are preferred because of their good performance. Synthetic polymers' usage is increasing day by day, they are not all produced from renewable resources and are not biodegradable in nature. In recent years, the development of eco-friendly polymers and the increasing interest in reducing packaging waste have encouraged the usage of biodegradable and renewable films. In this respect, bio-based and biodegradable polymers are the ideal candidates for the replacement of fossil-based plastics and one of them is poly (butylene succinate) (PBS). PBS is a suitable thermoplastic polymer for biomedical and food packaging applications with its biocompatibility, biodegradability, non-toxicity, easy processability, and good mechanical/thermal properties. PBS is in high demand in the bioplastics industries due to its features; however, PBS is very expensive. Hence, it is often mixed with biopolymers or natural molecules to reduce production costs and to favor different applications. (Mohamad et. al,2022)

Composite films usually have been prepared by using compounds such as casein, whey protein, corn saddle, soy protein, wheat gluten, and gelatin often being utilized (Fabra et. al,2009). Sodium caseinate (NaCas)(SC) is one of the compounds that has been used to form biodegradable films and coatings; SC possesses satisfactory thermal stability and can easily produce transparent, flexible, colorless, eco-friendly films from aqueous solutions owing to its random coil nature and ability to form intermolecular bonds and make electrostatic and hydrophobic interactions (Alizadeh-Sani et al,2021).

The current work aims to prepare packaging films by blending PBS and NaCas (SC), as well as studying the effect of different concentrations of SC in a PBS matrix on the mechanical, structural, and thermal properties of the films.

MATERIALS AND METHODS

Materials

PBS was used as one of the matrix materials and it was supplied from PTT MCC Biochem (density: 1,26 g/cm³, melting temperature: 115 °C). As another matrix material, the commercial NaCas (SC) (Protein ≥ %92) was obtained from Acrocs Organics Thermofisher Scientific Brand.

Methods

Before the blends were prepared, each was dried at 80°C for 24 hours. The composites were prepared by using a co-rotating twin-screw lab-scale extruder (Xplore 15 ml Micro-compounder). The extrusion parameters were barrel temperature of 130 °C, screw speed of 100 rpm, and 3 min residence time. The compounds were taken from the extruder in paste form and then pelleted using a pelletizing machine. Pellets were moulded into films with the help of a laboratory-scale hot press (60 Bar, 140 °C, 1 min cooking time).

The prepared composites were characterized by tensile test (ISO-527), contact angle test, differential scanning calorimeter (DSC), and thermogravimetric analysis (TGA).

The tensile tests of the films were carried out in a universal test device at a tensile speed of 10 mm/min and at room temperature according to ASTM D 882 standard. Film samples were

prepared in 2x7 dimensions and at least 5 samples were tested for each value. The tensile strength and elongation at break values of the film samples are given by taking the average value.

Thermal stability was evaluated using a Mettler Toledo TGA1 Star trademark machine. The samples were heated from ambient temperature to 25 °C at a rate of 600 °C with a heating rate of 10 °C min⁻¹ under the nitrogen atmosphere.

Differential scanning calorimetry (DSC) was used to determine thermal properties of the blends. The samples were first heated from -60 °C to 150 °C at a heating rate of 10 °C min⁻¹. To erase the thermal history, sample was kept at 150 °C for 3 min. and cooled to -60 °C. After waiting for 3 minutes at -60 °C, it was reheated to 150 °C.

Contact angle measurements were done by using the KSV Attention theta lite machine. Approximately 5 µl of deionized water was used and the measurements of the film surfaces were conducted at room temperature.

RESULTS

Tensile test

The tensile test was used to determine the effects of NaCas (SC) inclusion into the PBS. The tensile strength and strain at break values are given in Figure 1 & Figure 2. While the tensile strength of the PBS film was 13.4 MPa, the 70PBS/30SC blend showed the lowest tensile strength (6.7 MPa) of all NaCas containing films. When the amount of SC increased to 30 wt.%, there was a sharp decrease in tensile strength by 50 %. A similar trend was observed in the strain at break values. Neat PBS show that has a ductile structure, giving the highest elongation value. The strain at break value of the composite containing 30 wt.% SC decreased to 2.6 and this nanocomposite exhibited a brittle structure.

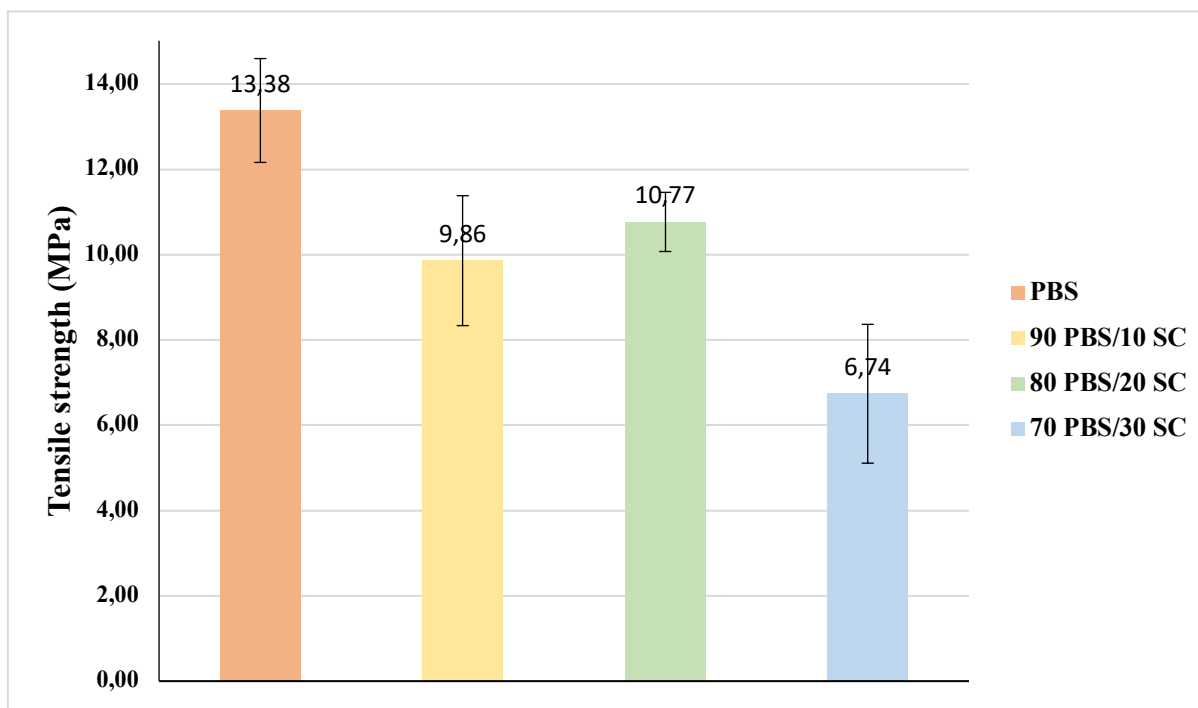


Figure 1. Tensile strength of the PBS/SC based samples

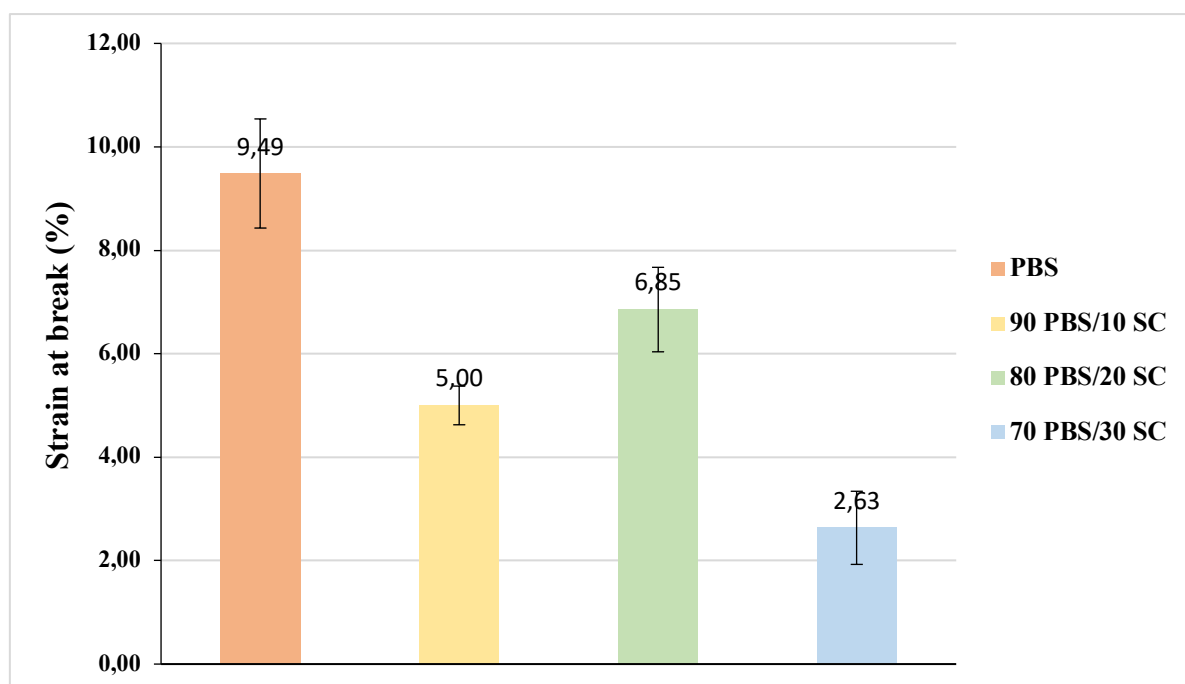


Figure 2. Strain at break values of the PBS/SC based samples

Differential Scanning Calorimeter (DSC)

DSC measurements were carried out to determine the thermal properties of the produced samples. Glass transition temperature (T_g), cold crystallization temperature (T_{cc}), melting temperature (T_m), crystallization temperature (T_c), and % crystallinity value (X_c) obtained from DSC analysis were given in Table 1. With the addition of NaCAS (SC) into the PBS, T_m values did not change much, but the crystallinity values of the material increased with increasing SC content. The highest crystallinity value of 26.5% was observed in 70 PBS/30 SC blend film. Moreover, the enthalpy values of the material decreased with increasing rate of SC.

Table 1. DSC data of the samples

Sample	T_g (°C)	T_{cc-1} (°C)	T_{m1} (°C)	T_c (°C)	T_{cc-2} (°C)	T_{m2} (°C)	ΔH_{m2} (J/g)	Crystallinity X_c (%)
PBS	-	100.5	120.7	73.6	100.4	115.7	55.4	19.7
90 PBS/10 SC	23.7	99.1	118.7	72.3	97	116	55.1	24.3
80 PBS/20 SC	28.4	97.3	116.6	69.7	100.4	114.9	49.7	24.6
70 PBS/30 SC	29.1	98.5	119	71.4	103.6	116.8	47	26.5

Thermogravimetric Analysis

TGA was applied to determine the thermal stability of pure polymer and blends. The 5 wt.% and 50 wt.% degradation temperatures (T_{d5} and T_{d50}), maximum degradation temperatures

(T_{max}), and residual char values obtained from TGA analysis are listed in Table 2. Thermogravimetric analysis curves of the samples are given in Figure 4. PBS exhibited a one-step degradation starting at 346 °C. As the SC content increased, the degradation temperatures decreased. At the same time as was expected the percentage of char residue increased with the increasing SC ratio. This can be attributed to higher char amount of SC.

Table 2. Thermal stability of the samples

Sample	T _{d5} (°C)	T _{d50} (°C)	T _{max-1} (°C)	Char (%) (600 °C)
PBS	346.3	389.5	394.9	1.3
NaCAS (SC)	76.6	341.2	316.9	22.8
90 PBS/10 SC	338.7	388.2	393.2	5.9
80 PBS/20 SC	307.7	384.4	390.7	6.0
70 PBS/30 SC	286.7	373.5	380.6	11.2

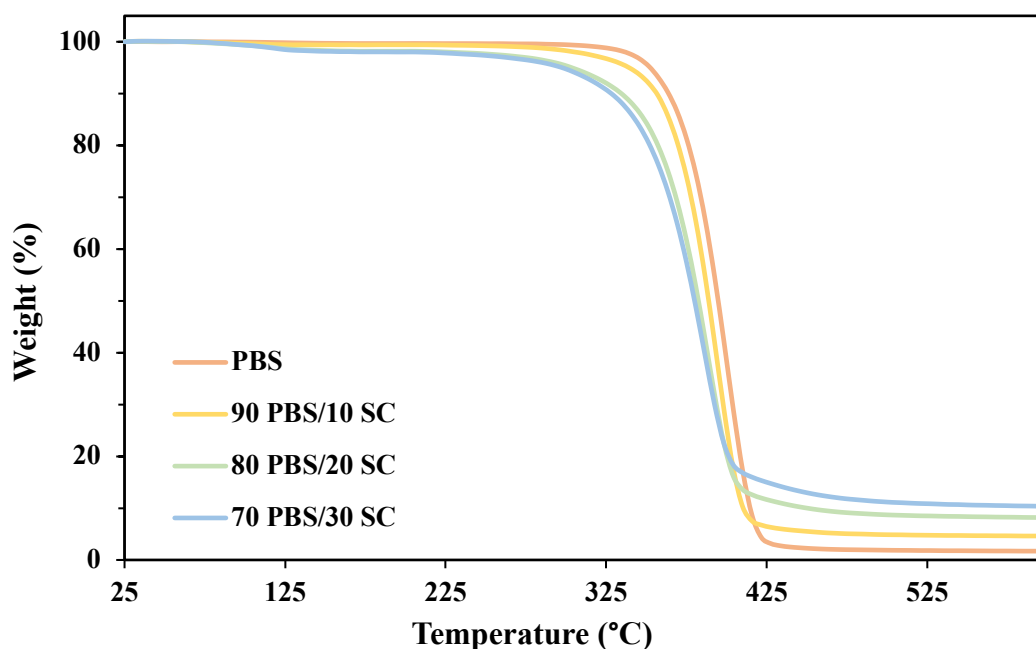


Figure 3. Thermogravimetric analysis curves of the samples

Contact Angle (CA)

The surface wettability of samples was determined from the measurements of water drop contact. CA measurements provide important information about the surface roughness and hydrophilicity (Lee et al., 2003). If the surfaces have a higher than 90° contact angle this is called a hydrophobic surface, and the increase in surface roughness makes the contact angle larger according to the Wenzel equation (i.e. more hydrophobic). (Good,1952) By measuring the CA with the water, it was investigated whether the addition of SC would have a positive effect on the wettability properties of the PBS film. As can be seen in Figure 3, the neat PBS had a contact angle of 82.3. The addition of the SC resulted in an increase in the contact angle of the PBS with the water, showing an increasing trend in values as the amount of SC increased, reaching values of 92.6 for PBS/30SC.

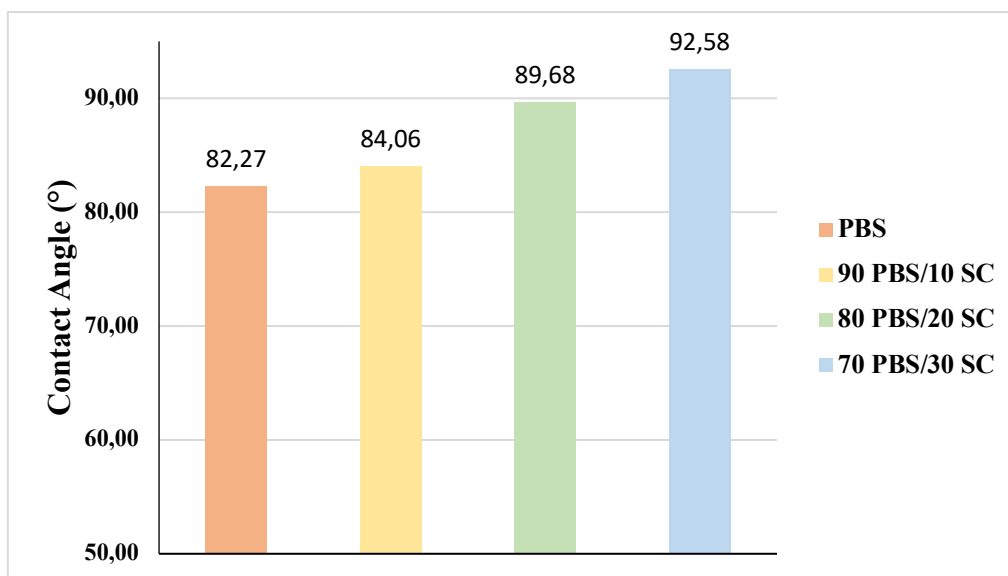


Figure 4. Contact angle of the samples

CONCLUSION

The PBS/SC blends were produced by using extrusion and hot press processes. The mechanical, thermal properties, and contact angle values of samples were determined. The tensile strength of the blended films has decreased with the increased SC amount. The 70 PBS/30 NaCas (SC) blend showed the lowest tensile strength (6.7 MPa) of all film samples. It was observed that the melt crystallization temperature (T_c) did not change much, but the crystallinity increased. By measuring the contact angle with the water, it was investigated whether the addition of the SC would have a positive effect on the wettability properties of the PBS, has a smaller contact angle than all other formulations. It was observed that the contact angle of PBS with water increased with the addition of SC.

This quick check study allows us to suggest a potential use of PBS with proteins or other biobased materials in food-packaging applications. Further studies on water-vapor permeability (WVTR), Fourier Transform Infrared Spectroscopy (FTIR), and also antimicrobial activities should be conducted to understand these kinds of materials.

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THE INVESTIGATION OF RHEOPHYSICAL PROPERTIES OF FLUID FLOW IN MICROCHANNELS

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ABSTRACT

Microfluidics is one of the new research area in science and technology which refers to microfabricated fluidic systems using channels with the dimensions of micrometers. Nowadays, microfluidics attracts more attention and demand due to fast reaction rate, short analysis time and reduced reagent consumption. Currently, the study of the physics of fluid flow in microchannels and low-permeable reservoirs is an important scientific task in petroleum industry as well.

The previous experimental studies revealed that a viscous liquid during flow in low-permeable reservoirs exhibits an anomalous non-Newtonian character, accompanied by a violation of the linearity of the filtration process, and, consequently, Darcy's law. It was also determined that starting from a certain critical size of the openness h of the crack, the flow of a Newtonian fluid behaves as non-Newtonian, with the manifestation of an initial pressure gradient and flow locking. In this research work, the role of electrokinetic potential on the regulation of the rheophysical properties of fluid flow in microchannels was experimentally examined. Oil-water emulsion with the composition of 70% and 30% respectively was used as the working fluid. Magnetic field is applied to the entrance of the microchannel model to adjust the electrokinetic potential of the fluid at various openness h . Bingham model is used to evaluate the rheological parameters of hydrocarbon flow in the absence and presence of a magnetic field in the entrance of the model. It is established that a reduction in the electrical potential leads to a significant decrease in the yield shear stress during the fluid flow in the microchannel.

KEYWORDS: microchannel, magnetic field, yield shear stress, electrical potential.

THE R PROGRAMMING LANGUAGE CAN BE A USEFUL TOOL IN THE FIELD OF TOMATO CULTIVATION IN AZERBAIJAN

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ABSTRACT

The R programming language proves highly beneficial for agricultural research and tomato farming, playing a crucial role in several key aspects. The following points underscore the significance of utilizing R in the context of tomatoes:

Data Visualization and Analysis: Renowned for its robust statistical analysis and data visualization capabilities, R is instrumental for researchers examining datasets related to tomato farming. Tools like R's ggplot2 aid in presenting complex statistics, enabling informed decision-making based on crop productivity, weather trends, disease incidence, and soil composition.

Building Predictive Models with Statistical Packages: R's extensive array of statistical packages and libraries proves invaluable for predicting tomato yields. Researchers leverage R to construct models forecasting yields based on variables like weather, soil quality, and farming techniques. This predictive modeling empowers farmers to optimize agricultural practices.

Disease Modeling and Prediction: R is utilized for simulating and predicting disease presence in tomato plants. By analyzing historical data and environmental factors, researchers create models predicting disease outbreaks. This enables farmers to take preventive measures, mitigating the impact of diseases on tomato crops.

Crop Improvement through Genomic Analysis: In the realm of biotechnology, R is commonly employed for analyzing genetic data in genomics research. This aids in interpreting genomic data related to tomato plants, supporting breeding efforts to develop cultivars with desired traits such as enhanced yield and disease resistance.

Agriculture Decision Support Systems: R can seamlessly integrate into decision support systems for agriculture. Researchers use R to develop algorithms providing farmers with data-driven advice on planting dates, irrigation control, and pest management. This empowers farmers to make well-informed decisions based on forecasts and statistical analysis.

Quality Control and Grading: R's capabilities extend to analyzing and grading tomatoes based on quality parameters. Statistical models consider factors like size, color, and shape to assess tomato quality, particularly beneficial in post-harvest processes and quality control.

Open Source and Community Support: Being an open-source language with a robust user and developer community, R is a favored choice among agricultural researchers and practitioners in tomato cultivation. The extensive availability of packages and libraries facilitates access to diverse tools and resources for various agricultural applications.

In conclusion, the versatility and statistical prowess of the R programming language make it an invaluable tool in the realm of tomato cultivation, supporting data analysis, modeling, and decision-making. Researchers and practitioners can leverage R to enhance productivity and sustainability in tomato farming.

KEYWORDS: R programming language, machine learning, tomato, farming, prediction, decision-making.

THE EFFECTS OF BIOMIMICRY APPLICATIONS ON LEADERSHIP AND STRATEGY IN ORGANIZATIONS

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ABSTRACT

Biomimicry is an approach that focuses on design inspired by nature and the development of useful strategies for solving people's problems. This study aims to examine the effects of biomimicry practices on leadership and strategy in organizations. The study aims to highlight the value of biomimicry as a potential resource to increase sustainability, innovation, and competitive advantage of organizations by learning from nature. Biomimicry has the potential to provide a competitive advantage by drawing inspiration from processes in nature and leadership approaches for the strategic management of organizations. The study consists of a literature review and case studies of biomimicry practices in organizations. The data from various organizations helps us to understand how biomimicry practices are related to leadership and strategy. The results show that biomimicry practices have positive impacts on leadership and strategy in organizations. Products and processes inspired by nature stimulate innovation and increase environmental sustainability. By adopting biomimicry in their organizations, leaders can create a more effective strategy and support sustainability. The study recommends that organizational leaders and strategy developers develop expertise to integrate biomimicry practices into organizations' strategic planning, foster a culture that encourages innovation inspired by nature, and train employees in biomimicry. In addition, they can evaluate how biomimicry practices can contribute to environmental sustainability goals and incorporate this knowledge into strategic decision-making processes. In conclusion, this study highlights the benefits that biomimicry practices offer to organizations in terms of leadership and strategy and provides a guide for organizations seeking to create more sustainable business strategies in the future.

KEYWORDS: Biomimicry, Organizations, Leadership, Strategy, Innovation.

BIYOMİMİKİRİ UYGULAMALARININ ORGANİZASYONLARDA LİDERLİK VE STRATEJİ ÜZERİNDEKİ ETKİSİ

ÖZET

Biyomimikri, doğadan ilham alarak tasarım ve insanların problemlerinin çözümü için faydalı stratejilerin geliştirilmesine odaklanan bir yaklaşımdır. Bu çalışma, organizasyonlarda biyomimikri uygulamalarının liderlik ve strateji üzerindeki etkilerini incelemeyi amaçlamaktadır. Çalışma, doğadan öğrenerek organizasyonların sürdürülebilirlik, yenilikçilik ve rekabet avantajını artırmak için bir potansiyel kaynak olarak biyomimikrinin değerini vurgulamak amacını taşımaktadır. Biyomimikri, doğadaki süreçlerden ve organizasyonların stratejik yönetimi için liderlik yaklaşımlarından ilham alarak, rekabet avantajı sağlama potansiyeline sahiptir. Çalışma, literatür taraması ve organizasyonlardaki biyomimikri uygulamaları üzerine yapılan örnek olay analizlerinden meydana gelmektedir. Çeşitli organizasyonlardan elde edilen veriler, biyomimikri uygulamalarının liderlik ve strateji ile nasıl

ilişkilendirildiğini anlamamıza yardımcı olmaktadır. Çalışma sonuçları, biyomimikri uygulamalarının organizasyonlarda liderlik ve stratejiye olumlu etkiler sağladığını göstermektedir. Doğadan esinlenerek geliştirilen ürünler ve süreçler, inovasyonu teşvik ederken çevresel sürdürülebilirliği artırmaktadır. Liderler, biyomimikriyi organizasyonlarında benimseyerek daha etkili bir strateji oluşturabilir ve sürdürülebilirliği destekleyebilirler. Çalışmada, organizasyon liderlerine ve strateji geliştiricilerine, biyomimikri uygulamalarını organizasyonların stratejik planlamasına entegre etmek için uzmanlık geliştirmek, doğadan ilham alarak inovasyonu teşvik eden bir kültürü teşvik etmek ve çalışanlara biyomimikri konusunda eğitim vermek gibi öneriler sunulabilir. Ek olarak, biyomimikri uygulamalarının çevresel sürdürülebilirlik hedeflerine nasıl katkı sağlayabileceğini değerlendirmek ve bu bilgileri stratejik karar alma süreçlerine dahil edebilirler. Sonuç olarak, bu çalışma, biyomimikri uygulamalarının liderlik ve strateji açısından organizasyonlara sunduğu faydaları vurgulamakta ve gelecekte daha sürdürülebilir iş stratejileri oluşturmak isteyen organizasyonlar için bir rehber sunmaktadır.

ANAHTAR KELİMELEER: Biyomimikri, Organizasyonlar, Liderlik, Strateji, İnovasyon.

TEMPORAL FLUIDITY IN MODERN ORGANIZATIONS: RECONCEPTUALIZING TIME IN DECISION-MAKING AND STRATEGY FORMULATION

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ABSTRACT

Historically, organizational processes have been characterized by temporal dynamics, wherein time has been conceptualized as a linear and unchanging object. Nevertheless, the dynamic nature of the contemporary corporate landscape, characterized by the influence of digital transformation, remote work practices, and multinational operations, poses a challenge to the traditional concept of temporal limits. The article examines the phenomenon of temporal fluidity in contemporary organizations, investigating the complex interconnections between time and many aspects of organizational operations. This study emphasizes the impact of digital workspaces on temporal dissonance, which disrupts the traditional 9-5 work model and alters team decision-making processes through the use of asynchronous communication. Moreover, the study highlights the increased demand placed on firms to take prompt strategic measures as a result of time constraints, hence requiring a heightened level of strategic agility. The complex differences in how time is perceived within various cultural frameworks are also highlighted, underscoring their impact on decision-making processes in multinational contexts. The present study involves a theoretical inquiry that ultimately leads to a contemplation of decision-making hierarchies, with a particular focus on their evolution within the context of dynamic temporal frameworks. The primary objective of this study is to bring attention to and redefine the significance of time within contemporary organizations. The objective of this study is to analyze the intricacies of temporal dynamics in order to provide organizations with valuable insights on how to cultivate adaptability. This will enable businesses to align their strategies and decisions with the ever-changing temporal landscape of the modern business environment. The investigation holds great significance because to its potential to redefine organizational paradigms, equipping entities to thrive in a future where the ability to adapt to changing circumstances is crucial for achieving success.

KEYWORDS: Temporal fluidity, decision making, strategy formulation.

MODERN ORGANİZASYONLARDA ZAMANSAL AKIŞKANLIK: KARAR VERME VE STRATEJİ OLUŞTURMADA ZAMANI YENİDEN KAVRAMSALLAŞTIRMAK

ÖZET

Zamansal dinamikler geleneksel olarak organizasyonel süreçlerin önemine vurgu yapar ve bu açıdan zaman doğrusal ve sabit bir varlık olarak algılanır ve değerlendirilir. Ancak modern iş ortamının dijital dönüşüm, uzaktan çalışma yöntemleri ve küreselleşmiş operasyonlarla evrimleşen gelişen manzarası, bu geleneksel zamansal sınırlar anlayışında önemli ölçüde değişimler gerçekleştirmiştir. Bu terik araştırma, zaman ve organizasyonel işlevler arasındaki karmaşık kesişimleri keşfederek bu değişimi irdelemeyi amaçlamaktadır. Çalışma, dijital çalışma alanlarının zamansal uyumsuzluğa nasıl yol açtığını, geleneksel 9-5 çalışma paradigmasını nasıl bozduğunu ve asenkron iletişim yoluyla ekibin karar verme sürecini nasıl yeniden şekillendirdiğini de vurgulamaktadır. Ayrıca araştırma sonucunda, zaman daralması nedeniyle organizasyonların daha hızlı stratejik eylemlere yönelmesi yönündeki baskının arttığı ve bu durumun da gelişmiş stratejik çeviklik gerektiği ortaya çıkmıştır. Çeşitli kültürel paradigmalarda zamansal perspektiflerdeki karmaşık farklılıklar da ön plana çıkarılarak bunların çok uluslu ortamlarda karar alma süreçleri üzerindeki etkileri de alanyazında konu içerisinde ortaya çıkan diğer bir boyuttur. Bu ortaya çıkan durum karar verme hiyerarşileri üzerine bir düşünceyle, onların değişken zaman yapıları altındaki dönüşümlerini de doğal süreçlerle etkilemektedir. Bu çerçeveden bakıldığında araştırmanın çıkış noktası, modern organizasyonlarda zamanın rolünü vurgulamak ve onu yeniden kavramsallaştırmaktır. Çalışma, zamansal dinamiklerin nüanslarını ortaya çıkararak, işletmelere uyarlanabilirliği teşvik etme, stratejilerinin ve kararlarının çağdaş iş dünyasının değişken zamansal gerçekleriyle uyumlu olmasını sağlama konusunda içgörüler de ortaya koymuştur. Bu keşfin önemi, organizasyonel paradigmaları yeniden şekillendirme, varlıkları zamansal değişimlere uyum sağlamanın başarının temel taşı haline geldiği bir geleceğe hazırlama potansiyelinde yatmaktadır.

ANAHTAR KELİMELE: Zamansal akışkanlık, karar verme, strateji oluşturma.

TEMPORARY HOUSING DESIGN FOR POST-EARTHQUAKE IN ISTANBUL; LESSONS LEARNED FROM JAPAN

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ABSTRACT

After the recent and devastating earthquakes in our country, the need for temporary shelter on a large scale has become a major problem. Problems such as emergency shelter, access to temporary shelter areas and solutions according to density have come to the fore. The abandonment of the disaster victims and the inadequacy of the areas offered in the city create traumatic effects and experiences on the earthquake victims, especially health problems. The town of Onagawa in Miyagi Prefecture, Japan, was severely damaged by the earthquake and tsunami of March 11, 2011, and architect Shigeru Ban sought a solution by designing a multi-story temporary housing complex for the survivors. This paper aims to propose a model of multi-storey temporary shelter housing for the expected Istanbul Earthquake with the teachings of the Onagawa Container Temporary Housing Project and to draw attention to the potentials of high-density unit production after the disaster.

Keywords: Cargo Container, Temporary Housing, Disaster Management, High Density, High-Rise Container Design

INTRODUCTION

Today, many cities are at risk of disasters. Recent disaster statistics for the effects of natural disasters worldwide show that meteorological-based events are in the first place, but geophysical-based disasters are the leading cause of loss of life and injury (Munich, 2019). Disaster statistics covering a 60-year period (1950-2008) for Turkey show that earthquake-related disasters are in the first place (Gökçe, Özden, & Demir, 2008). On the other hand, disaster statistics for the twenty-five-year period (1990-2014) show that loss of life and economic losses are mostly caused by earthquakes, and floods are second only to earthquakes in terms of frequency of occurrence (UNDRR, 2019). There is an earthquake risk on the North Anatolian Fault Line, part of which is located in the Marmara Sea, which will significantly affect Istanbul and its surroundings. The magnitude of this risk reveals the importance of taking measures to reduce potential disaster risks for Istanbul (Yücel and Ciritci, 2020).

Literature review

The literature review has been narrowed within the scope of this paper to be related to the post-disaster use of containers. In order to reveal the solution potential of containers for the shelter problem, the post-disaster temporary shelter centers proposed for Izmir by Izmir AFAD Provincial Directorate Improvement Branch were examined and a container city design was proposed for the most suitable area (Dayanır, 2019). In particular, the shipping container is suitable for post-disaster situations as a temporary housing application and design examples are

found in the literature. However, it has been observed that the social impacts during use have been ignored in general studies and have not been included in the research topics. In order for the implementation of such projects to be successful in a post-disaster environment, the social dimensions of temporary housing should be investigated. In this context, the field studies and temporary housing experiences of communities affected by Hurricane Katrina in the United States in 2005, the Christchurch Earthquake in New Zealand in 2011 and the bushfire in Australia in 2009 can be mentioned. These studies have identified a number of key social factors that have been found to be important for the success of temporary housing projects with shipping containers. These are issues related to flexibility in ownership, reuse and settlement arrangement, in addition to pre-disaster planning by authorities, taking into account the varying characteristics of different types of disasters. In addition, it is recognized that these are not suitable for all post-disaster applications and further research is needed for relevance in different contexts (Zhang G. et al. 2014). An architectural adaptation of a shipping container for housing internally displaced persons in Southern Nigeria was studied. The available options for architectural adaptation of shipping containers were explored. The study recommends that the most preferred architectural adaptation options based on the survey results are the construction of accommodation from shipping containers in the region. It highlights two severe social and environmental problems found in Nigeria, namely mass displacement leading to homelessness and an increase in the number of empty shipping containers abandoned at ports (Obia, 2020). Similarly, the housing problem of Syrian refugees has been addressed through the use of shipping containers (Rahman, 2017). After the 2011 Christchurch earthquake, studies on the transformation of urban spaces and post-disaster reconstruction have been carried out, and how they can contribute to the resilience of a city has been discussed (Brand and Nicholson, 2016). It has been observed that the subject of this paper, multi-storey post-disaster temporary housing examples, especially for dense settlements, has not been sufficiently studied academically. A housing community built by architect Shigeru Ban in the city of Onagawa in Miyagi after the 2011 earthquake in Japan can be seen. Within the scope of this paper, this work will be analyzed and its potentials for Istanbul will be emphasized.

Scope and content of the paper

There are various examples of post-disaster temporary settlements in Turkey and around the world, built with different materials and construction methods. In some of these applications, there are problems identified during the use of temporary housing, such as public open space and common areas that can be handled together with social assistance and common areas that will make it possible to enable this. Within the framework of this problem, social common areas should definitely be included in the design of temporary housing units in post-disaster plans in the urban fabric, and it should be taken into consideration that this area is a necessary need not only for mutual aid, but also for disaster victims to establish contact and rejoin social life. Therefore, the first important requirement is social public common areas.

Another important problem is how the expected Istanbul Earthquake will take shape within the dense population of Istanbul and how it can be designed to be both inclusive and functional. Density analysis should be made by taking into account the post-earthquake scenarios of the Istanbul Metropolitan Municipality and AFAD, and special solutions should be made for densely populated settlements. At this point, solutions can be developed through containers that are currently used in temporary housing designs. This paper will focus its studies on these two issues based on these two problems.

CHAPTERS

Preparations and gathering areas for the expected Istanbul earthquake

According to Istanbul Metropolitan Municipality (IBB) data (URL-1), the nighttime residential population of Istanbul is 15 million and the daytime residential population is 6 million. According to the "Earthquake and Damage Loss Estimation Study" conducted by IBB Earthquake and Soil Investigation Directorate and Boğaziçi University in 2018, economic and physical losses and damages are expected in Istanbul under the scenario of a 7.5 magnitude destructive earthquake. According to a 7.5 magnitude destructive earthquake scenario, the number of very heavy and heavily damaged buildings in Istanbul is around 48 thousand, and the number of buildings with moderate and higher damage is around 194 thousand. According to these figures, 22.6 percent of buildings will collapse, 25 million tons of debris will be generated, 30 percent of roads will be closed and infrastructure will be severely damaged. In the earthquake mobilization plan published by IBB, there is an article on 'post-disaster gathering/sheltering areas' that is directly related to the post-earthquake scenarios discussed in this study (URL-1). According to the presentation of Ekrem Imamoglu, the mayor of IBB, a total of 859 gathering areas with a capacity of 21 million people are being studied for the identification and construction capacity of shelter areas after the Istanbul earthquake (Figure 1).

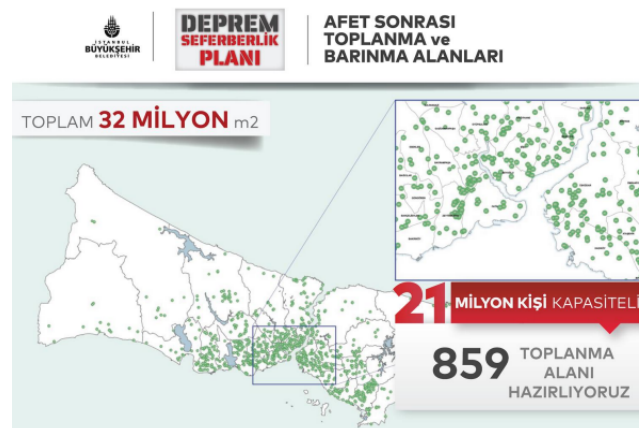


Figure 1. An image from the presentation made by IBB Presidency (URL-1)

IBB Department of Earthquake Risk Management and Urban Improvement has identified the Gathering and Temporary Shelter Areas of 39 districts (URL-2). Decision Support Model was applied in the selection of the areas. In the model, the criteria for the selection of assembly areas were determined, a scoring method was applied, and a model was put forward based on scientific bases involving AFAD, Directorate of Parks and Gardens, AKOM, Coastal Safety Directorate and many other relevant institutions (URL-2). IBB's detailed earthquake-related studies are ongoing. The size and quality of the assembly areas (Figure 2), which vary according to the districts they have integrated into the city maps, are shared transparently on their website (URL-3).

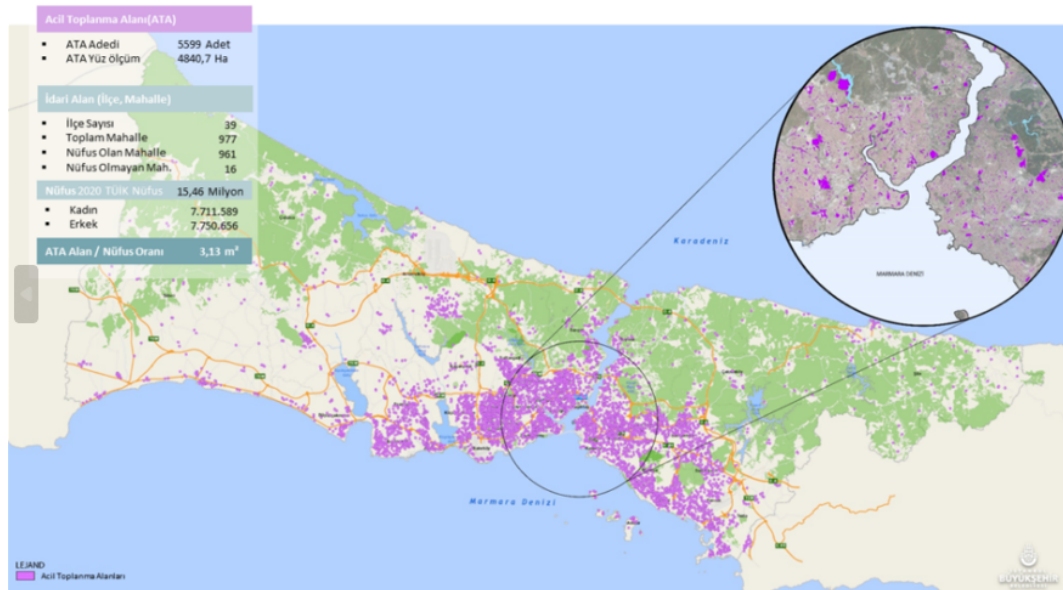


Figure 2. Istanbul Emergency Gathering Area Map, IBB (URL-3).

Although publicly supported studies, which have increased in recent years, have created a positive impact and awareness, it does not change the fact that the studies we have are insufficient and that the resilience of the megacity against earthquake in a possible Istanbul Earthquake is not at an adequate level and that all institutions, including the public, are unprepared. In this regard, Uyar and Özkan's (2023) First Stop After the Earthquake: A Review of Gathering Areas in Istanbul, Uyar and Özkan (2023) provide a very detailed analysis of Istanbul's gathering areas. The article, which is quite overlapping with the subject we are working on, answers some of the questions it seeks within the framework of the title 'Proposals for the solution of temporary housing areas in densely populated districts with multi-storey containers', which is proposed as a research question in the content of this paper. In this respect, their work has not only formed a basis for us, but also provides the quality of seeking answers to some of the questions they have opened as a continuation.

GENERAL CHARACTERISTICS OF GATHERING AREAS AND SETTLEMENTS FOR ISTANBUL

When AFAD's 'Directive on the Establishment, Management and Operation of Temporary Accommodation Centers' (AFAD 2015) dated 04.11.2015 is examined, it is seen that it contains detailed information on the site selection and characteristics of temporary accommodation units after disasters. When we extract the *capacity* parameter from this content, the following two articles draw attention.

- Suitable for capacity expansion to accommodate new containers/tents in case of population growth,
- Closed area per person for tents or containers should be between 3.5-4.5m².

The biggest problem for Istanbul, whose population density is quite high compared to its surface area, is the determination of temporary shelters. Uyar and Özkan (2023) investigated the spatial adequacy of assembly areas in districts with high earthquake risk. The authors overlapped IBB (2020) and JICA (2002) studies with priority areas in terms of earthquake risk and determined the districts that will need the most assembly areas after an earthquake. The gathering areas identified by IBB include parks, gardens, parking lots, cemeteries, gardens of public buildings,

shopping mall squares, marketplaces, etc. (Figure 3). In addition to the assembly areas on IBB's web pages, 39 district municipalities also share a detailed map of their neighborhood-based assembly areas on their own websites. Figure 3 shows a screenshot from Küçükçekmece Municipality's web page as an example.

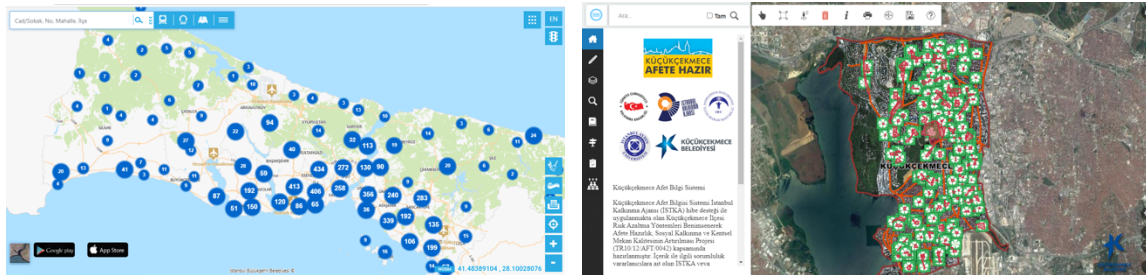


Figure 3. Left- Istanbul Gathering Areas Map, IBB City maps (URL-4)- Right- Küçükçekmece Municipality Web page- Mapping of gathering areas (URL-5)

Uyar and Özkan (2023) give the number of Istanbul Gathering Areas as 823 in their article, but after the article was published, it was updated as 859 on IBB web pages as can be seen in URL1. The authors' findings that 'the assembly areas in the districts of Adalar, Bağcılar, Bayrampaşa, Büyükçekmece, Çatalca, Esenyurt, Fatih, Gaziosmanpaşa, Güngören, Kadıköy, Kağıthane, Kartal, Küçükçekmece, Sancaktepe, Sultanbeyli and Sultangazi will be insufficient for the population in the region in the event of a possible earthquake' remain valid since the updated number of assembly areas is negligible. According to the studies of the Istanbul Planning Agency (IPA), the earthquake risk in Istanbul threatens a large area between the Golden Horn and Küçükçekmece Lake on the European side, Bakırköy, Zeytinburnu and Fatih districts on the coastal line, and Bahçelievler, Güngören, Bağcılar, Esenler, Bayrampaşa and Küçükçekmece districts with high population density (URL-6). Among the districts mentioned here, it is possible to make an example of Küçükçekmece, which has gained a rapid acceleration in the rate of population growth in recent years.

Within the framework of detailed studies conducted by public institutions and the findings they have reached over the years, Küçükçekmece ranks first among the districts of Istanbul with high probability of damage after an earthquake and districts with high population density. According to the information obtained within the scope of IBB's 'Istanbul province possible earthquake loss estimates update project', which was shared with the public in June 2020, 778,889 people live in the district according to the 2019 census. This number is 808,957 by 2022. According to the probable loss scenario prepared by taking into account many parameters, the number of casualties is expected to be around 1515, the number of seriously injured 925, the number of those who will be treated in hospital 4079 and the number of slightly injured 7413 (URL-7). Küçükçekmece Atakent neighborhood is densely populated with high-rise buildings and housing estates. When we subtract the numbers given in the scenario, there is a need for temporary shelter for the remaining over 790.000 people. If we consider containers as housing units for families of 4 people, there is a need for around 197.500 containers. Of course, temporary shelters do not consist entirely of containers; they also include tents and similar shelters that can be quickly set up with lightweight materials. If we make a realistic projection, it is not possible to produce or transport to the city in a short period of time the number of containers that can meet all the post-earthquake needs. In addition, after a certain period of time has passed and the damage assessments have been made by the institutions, some of the people will settle back into their undamaged houses. According to the same report, the number of households in need of temporary shelter on a neighborhood basis is also given. Atakent Neighborhood is the 3rd most populous neighborhood in Istanbul with a population of 102,682

as of 2022 (URL-8). In total, 72.774 households will be needed according to the scenario. Atakent Neighborhood has been included in the scenario as 3.055 temporary shelter needs in the report.

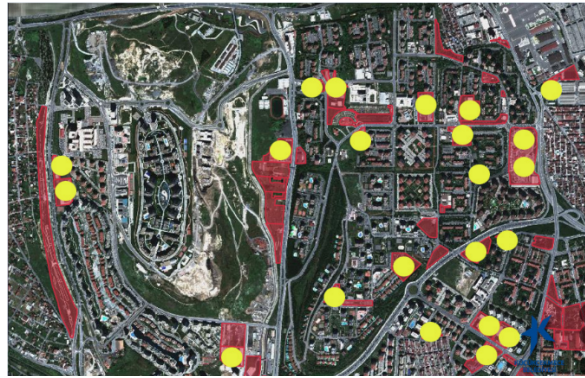


Figure 4. Unbuilt assembly areas of Küçükçekmece district

When we took the gathering areas for Atakent Neighborhood example from the web page of Küçükçekmece Municipality, it is seen that some of the designated areas already have buildings on them (areas marked with yellow color), which is possible for gathering but not for temporary shelter (Figure 4). The number of temporary shelter units in Atakent neighborhood, which is determined as 3055 in the report, constitutes a capacity of 12,220 people on the assumption that each unit will accommodate 4 people, and this number is well below the need. Precisely at this point, since we cannot expand the number of areas where the existing temporary housing units will be located to the lands that we cannot ignore the construction on the neighborhood, some innovative solutions should be proposed and new searches should be questioned.

Applications in Japan- Shigeru Ban's multi-storey container design

Japan, which is one of the countries highly affected by disasters such as earthquakes, tsunamis and forest fires, has reduced the number of losses considerably with a series of measures and regulations they have taken against disasters with very destructive consequences in their history. Within the scope of the study, the most striking design encountered in the literature review in the research involving multi-storey containers as a temporary housing unit after the disaster is the settlement realized by Pritzker Prize-winning architect Shigeru Ban in Onagawa, Miyagi region of Japan.

On March 11, 2011, a 9.0-magnitude earthquake and tsunami struck the Pacific coast of Tohoku, Japan. In Onagawa-Cho, the centre of the town was completely swept away by a 15m tsunami. To provide shelter for displaced families, Japanese architect Shigeru Ban, famous for his disaster relief projects around the world, proposed to construct multi-storey temporary housing units using shipping containers. Conventional single storey units would not supply enough housing because there was only limited flatland available in the hilly region above tsunami height. In his presentation with Sci Arc organization, Shigeru Ban explains that the reason for designing a multi-storey container design is that the users cannot even open curtains due to the noise and privacy problems arising from the proximity of the settlement in the limited area of the buildings and the social areas are not of sufficient quality in the designs made with single containers in the conventional layout (URL-9). In the presentation, Ban states that they designed

the settlement, which is normally single-storey, as multi-storey, creating 188 units, and thus they were able to accommodate more disaster victims without exceeding the budget (Figure 5).



Figure 5. Photograph of the campus designed by Shigeru Ban, Shigeru Ban Architects, (URL-10)

Hikone, a director at Ove ARUP & Partners, Japan, and Tokubuchi, a civil engineer at the same company, explain their motivation for the initial design process in their paper (2014);

“The standard type is a single storey house; therefore, we needed a large and flat area for the site in order to accommodate the required number of units. The standard specification was a set minimum for a shelter, with especially less consideration for sound and thermal insulation due to the assumption there will be a short occupancy because the houses are temporary. But this time everybody understood that most of the people needed to rely on the temporary houses for a much longer period due to the destruction of the community and infrastructure in the disaster area. The standard specification was not reviewed or improved in this specific condition, which was a double pain for the people who needed to live there. We wanted to improve the quality of life in the temporary houses.”

The designers first identified the advantages and disadvantages of using containers as shown in Table-1.

Table 1. Advantages and disadvantages of using Containers according to Hikone and Tokubuchi (table prepared by the authors)

Advantages of containers	Disadvantages od containers
Unit construction	They had limited size of openings in the walls
Ready made in the shop before shipping to the site	
Standard size and quality for shipping and automobile transportation	There was no flexibility in having large openings in the walls from a structural load path view point
Reuse after the event	

This post-disaster multi-storey container design is the first multi-storey temporary housing unit in Japan and due to Hikone and Tokubuchi (2014) those living in the houses reported that the comfort level of the users was excellent.

DISCUSSION

The multi-storey construction of containers as dwellings is an approach that has been practiced around the world. Recently, it is possible to see different forms of container architecture, which has significant advantages in terms of cost and convertibility (Figure 6).



Figure 6: From left to right, 'Muangthongthani Carcare' (URL-11), 'Multi-Story Prefab Steel Modular Modern Design Container House' (URL-12), 'Cité a Docks' (URL-13)

Dayanır et al. (2022), in their article on the compilation, grouping, definition and ranking of criteria for the site selection, planning and design of post-disaster temporary shelter areas using the Delphi method, carried out the suitability analysis of the post-disaster temporary shelter areas proposed for Izmir with the help of the list of site selection-planning criteria put forward by the Delphi method. None of the 83 assembly areas examined for Izmir within the scope of the article met all the criteria, and since only the "seferihisar2" area met all the criteria except for the proximity to health facilities, the authors designed a pilot container city based on the design implementation criteria. At this point, for the container city that meets the design criteria in Figure 7, the implementation of 3-storey containers provides more green space, more common areas for socializing and reserve space in case of the need to increase capacity.



Figure 7: On the left, the container city prepared by Dayanır et al. (2022) for İzmir-Seferihisar, taking into account its compliance with the regulations; on the right, the expression of the remaining common areas in yellow and green when the containers are worked in 3 floors with black spots (Prepared by the authors).

Project Manager Yasunori Hirano (2012) stated in a post-implementation interview that when disasters occur in Japan, prefabricated housing manufacturers and other large companies often mass-produce simple temporary housing units very quickly and architects are not involved. However, he emphasizes that with this project, starting from container projects, some architects started to work on temporary housing and it was a beginning for architects to establish an environment for building temporary housing that is more suitable for the quality of the living environment of disaster victims (URL-14).

The aim of this study is to look for ways to place as many temporary housing units as possible in their neighborhoods, within the framework of the fact that after the earthquake, whether slightly damaged or heavily damaged, people do not prefer to move to a settlement far away from their houses and neighborhoods, firstly for news from their relatives, neighbors and families, and secondly, in order to save their property left in their houses with their own efforts or with the help of the state, in order to be assured against the difficult situations awaiting them. Another point that is as important as this is to create social spaces that can respond to the socialization needs of disaster survivors after the earthquake. Because we know from our bitter experiences in Turkey that the social psychological dimension of the process is very heavy for the survivors, and in order to minimize this devastating effect, it is an important part of designing these settlements to create environments where they can socialize after creating spaces worthy of human dignity. As the authors, we believe that Shigeru Ban's design will inspire new similar designs considering the conditions, topography, physical conditions and population of Istanbul.

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MIDDLE-AGED WOMEN IN BUSINESS LIFE

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ABSTRACT

The workplace encounters varied experiences of menopause, influenced not only by symptoms but also by the surrounding work environment. Menopause's impact on the workplace extends to aspects such as quality of life, engagement, performance, motivation, and employer relations.

This study seeks to delve into the professional experiences of women in the realm of management and organization during the menopausal transition. Its objective is to discern the perceived effects of menopausal symptoms on work life and to provide recommendations for women managers and employers. Simultaneously, by focusing on the workplace effects of menopause, the study aims to address the gap in understanding menopausal women's work capabilities, explore strategies employed by women to navigate age- and gender-based discrimination, and foster awareness for creating a more supportive workplace environment.

The research is executed within a theoretical framework, with the goal of enhancing the awareness of managers in the business sector. Additionally, it is crucial to delve into the existing literature and empirical research concerning middle-aged women in the workplace to offer a comprehensive overview of the current knowledge in this domain. Through the synthesis and critical evaluation of these studies, the research aims to contribute to a more profound understanding of the challenges and opportunities encountered by middle-aged women in managerial positions.

KEYWORDS: Menopause, middle-aged workplace, equality.

INTRODUCTION

Currently, the landscape of work life is undergoing continuous evolution and diversification. Within this dynamic environment, various segments of the workforce are encountering unique experiences as they navigate and sustain their professional lives. In this context, the role of middle-aged women in the business realm has emerged as a significant subject that warrants examination in conjunction with social and economic dynamics.

Midlife typically encompasses the span between the ages of 40 and 60, representing a phase where individuals reach a significant juncture in their careers and navigate various experiences in their personal lives. Particularly for women, this age range involves juggling family responsibilities and menopause on one hand, and grappling with the challenges of work life on the other, all while continuing their professional journeys.

The age-related processes for women, characterized by physical and emotional changes at each stage, are generally examined in five periods (Ilgaz 1980; Coşkun 1996): Childhood Period 0-

8 years, Adolescence Period 9-18 years, Sexual Maturity Period 19-49 years, Menopause Period 50-64 years, and Old Age 64 years and above (Ilgaz, 1989; Coşkun, 1995).

This phase (Menopause) represents a crucial period in a woman's life, situated between productivity and the onset of old age. It signifies significant physical, psychological, and social changes in a woman's life. The most notable change during this period is the permanent cessation of menstruation, known as menopause (Kökçü and Çetinkaya, 2004).

Experiences of menopause in the workplace vary and are shaped not only by symptoms but also by the work environment. The effects of menopause in the workplace impact quality of life, engagement, performance, motivation, and employer relations.

Upon reviewing the literature, no study addressing the effects of middle age or menopause on the work life of women managers could be found. It is believed that conducting research in this area would contribute to the existing literature and provide valuable insights for both academics and management professionals. Additionally, it is anticipated to offer guidance from a managerial perspective.

The significant rise in the number of women entering the business sector in our country in recent years (Bedük, 2005) underscores the importance of conducting studies in this context. As women managers typically ascend to managerial roles in middle adulthood, this research is focused on examining the impact of middle adulthood on the professional lives of women in managerial positions.

Within this scope, the primary objective of this study is to investigate the repercussions of middle age or menopause on the working lives of women in the field of management and organization. The aim is also to contribute valuable insights to the existing literature on this subject.

Conducted within a theoretical framework, the study assesses the effects of women's menopausal symptoms (middle age) on their work and subsequently provides recommendations for employers and women in these roles.

IMPACT OF MENOPAUSE ON WORK

The influence of work on an individual extends to their social life, as individuals often spend more time with colleagues than with their families. Consequently, social activities are frequently planned in conjunction with colleagues. Fostering job satisfaction among organizational employees is instrumental in enhancing their commitment and productivity within the organization. As individuals reach a certain age, a substantial portion of their lives is dedicated to work (Bakan & Büyükbeşe, 2004).

The age and life stage of an individual play a pivotal role in shaping their attitudes, behaviors, and decisions. Hence, age-related disparities in people's perspectives and attitudes toward work are observable (Yerlisu & Çelenk, 2008). Older employees demonstrate better adaptability to work-related conditions, exhibiting a higher sensitivity to positive developments in job satisfaction compared to negative ones. Consequently, job satisfaction levels tend to rise with increasing age (Çelen et al., 2004). Another perspective posits that, with age, individuals' heightened adaptability stemming from experience contributes to increased job satisfaction (Cambaz, 2005).

Individuals in midlife are those who have attained a certain juncture in their careers, typically managing their professional and social lives within a structured framework (Kılıç, 2013). Work-related pressures often change this phase, prompting individuals to reconsider their income sources or explore new career paths. The majority of job transitions occur in this period (Kılıç,

2013). Additionally, midlife is characterized by the resolution of unfinished business. For instance, individuals with incomplete education may return to school to pursue new career opportunities. Moreover, individuals in midlife peak in terms of knowledge, skills, and experiences in the professional and working sphere (Koç & Titiz, 2016). This life stage marks the culmination of an individual's achievements, reflecting accumulated expertise and experiences in production and productivity in their endeavors and studies (Kılıç, 2013). During this period, there is a greater allocation of time and effort to work life (Koç & Titiz, 2016).

For many individuals, middle age serves as a time for reflection, assessment, and contemplation of current actions and future aspirations. During midlife, individuals become more attuned to issues such as career advancement, deciding on career changes, and striking a balance between family and work commitments. Many individuals in middle adulthood enjoy favorable status and earnings (Santrock, 2014).

However, midlife or menopause signifies a crucial phase in a woman's life, positioned between productivity and old age. This period, marked by physical, psychological, and social changes in women, can present additional challenges. The majority of research indicates that certain women perceive menopause as potentially impacting their work performance negatively, affecting their ability to work effectively. Conversely, alternative studies have delineated the positive effects of menopause on work life or elucidated how the work environment influences the experience of symptoms (Jack, Riach, & Bariola, 2019).

As an illustration, a British study discovered that among middle-aged women, key determinants of work outcomes were work-related factors like role clarity and job stress. Menopausal status was not directly correlated with work, but troublesome hot flashes in the workplace were associated with an intention to cease working (Hardy et al., 2018). In contrast, an Australian study revealed that, for the majority of women employed in a hospital, menopausal symptoms did not exert a negative impact on work performance (Hickey, Riach, Kachouie, & Jack, 2017).

In Australia, a nationwide study discovered that the majority of menopausal women exhibit success in the workplace (Gartoulla, Bell, Worsley, & Davies, 2016). Contrastingly, a Netherlands-based study revealed that women with severe menopausal symptoms were 8.4 times more likely to report a diminished ability to work compared to their symptom-free counterparts, increasing the risk of extended work absence (Geukes et al., 2016). Notably, this research demonstrated that symptom treatment leads to an improvement in workability (Geukes et al., 2019).

Conversely, a study conducted in Nigeria identified a significant negative association between menopausal symptoms and workability (Olajubu, Olowokere, Amujo, & Olajubu, 2017). Similarly, a Polish study among menopausal women highlighted a negative correlation between workability and the severity of symptoms related to depression and insomnia (Humeniuk, Bojar, Gujski, & Raczkiwicz, 2019). Additionally, a Japanese study reported that women experiencing more menopausal symptoms exhibited lower work performance (Hashimoto et al., 2020).

Glenn, Taylor, and Weaver (1977) uncovered a direct impact of age on job satisfaction. However, they sought to attribute this effect not to the aging process itself but rather to the shared demographic characteristics among employees in the same age group. In contrast, Wiggins (1984) presented research findings suggesting that variables such as working time, personality, and age do not significantly explain job satisfaction. Instead, he noted a positive correlation between professional seniority and adaptation to the work environment.

Oswald and Warr (1996) identified a consistent relationship between age and job satisfaction, unaffected by various variables such as individual characteristics and work values. They emphasized that this pattern applies to both genders, with the ages at which job satisfaction reaches its lowest point being close for both men and women (Oswald & Waar, 1996). In his study exploring the link between individual characteristics and job satisfaction, Bilgiç (1998) argued that age is not correlated with the overall job satisfaction levels of Turkish employees, contrary to prevailing assumptions about the impact of age (Bilgiç, 1998).

Research conducted in Turkey has indicated that the workplace context may not significantly influence the decision-making skills of middle-aged women (Ece, 2020). However, socioeconomic factors such as education level, employment status, and perceived economic welfare might impact women's attitudes toward family planning and related issues (Eryılmaz & Ege, 2016). Uçanok (1994) investigated the attitudes of women across different age groups toward menopause, examining their perspectives on life and menopausal symptoms. The study revealed a significant relationship between life perspective and both symptoms and attitudes towards menopause. In Kabukçu's (2000) study, conducted by the International Health Foundation in five European countries, the symptoms reported in women during menopause were as follows: introversion (30%), insomnia (32%), headache (38%), sweating (39%), fatigue (40%), irritability (41%), and hot flashes (55%).

Bektaş (2012) researched to explore the relationship between job satisfaction, motivation, and the meaning of life among middle and senior managers in the automotive sector. The findings revealed a positive correlation between the present meaning sub-dimension of life's meaning and intrinsic motivation and job satisfaction, with a negative correlation with extrinsic motivation. Moreover, significant differences in the current meaning level were observed based on gender and marital status, while no significant differences were found in terms of age, education level, total working time, working time in the organization, and monthly salary. The study also identified a positive relationship between the sought-meaning sub-dimension of managers' meaning of life and job satisfaction. Furthermore, the level of sought meaning exhibited significant differences based on education level, total working time, and monthly salary variables, with no significant differences observed in terms of gender, age, marital status, and working time in the organization.

DISCUSSION

Globally, there are 657 million women aged 45-59, some of whom actively contribute to the workforce during menopause. The experiences of menopause in the workplace exhibit a diverse range. These experiences are not only influenced by menopausal symptoms and context but are also significantly shaped by the workplace environment. This, in turn, impacts various aspects such as quality of life, engagement, performance, motivation, and relationships with employers.

It is essential to highlight menopause as a pivotal period of transformation in the lives of working women. The average age of menopause being 51.3 years in both developed and developing countries underscores the significance of addressing this aspect. Menopause is a phase within the broader timeframe defined as menopause, encompassing a wide age range (35-65 years). The term menopause or menopausal period encompasses the hormonal, physical, and psychological changes occurring in middle-aged women (Hatcher et al., 1990; Oskay, 1998). Women encounter challenges due to these changes, naturally affecting their quality of life and, consequently, influencing their work life negatively. While each life stage has its distinct characteristics, menopause holds special importance due to its profound effects on women's lives. Therefore, a comprehensive grasp of the attributes of midlife will provide women

managers with valuable insights concerning work-life quality, commitment, performance, motivation, and relationships with employers (Koç & Titiz, 2016).

In this phase characterized by the wisdom and resourcefulness of middle-aged women, there is a noticeable shift away from prioritizing the approval of others. Instead, a desire for self-actualization emerges among executive women in the business world. Middle age is considered a crucial factor in redirecting the female brain from focusing on others' needs towards viewing work as a means of direct self-fulfillment.

Employers acknowledge the necessity of making efforts to attract and retain an experienced workforce with valuable skills. They are also cognizant of the business case for preventing staff loss due to menopause. Consequently, employers must foster a culture where discussions about menopausal symptoms are acceptable. Providing training for managers and supervisors on menopause and how to conduct supportive conversations with employees is equally important. Managers should actively support staff to continue working by ensuring that women undergoing menopausal symptoms encounter neither stigma nor discrimination that could impact their job performance.

Women express the need for increased discussion about menopause in the workplace and a greater emphasis on raising awareness and providing information. Some women are open to disclosing their menopausal status and agreeing on suitable work arrangements, while others may be hesitant to share this information with line managers and employers.

It is important to note that menopause, whether a natural life stage or a result of treatments such as surgery, radiotherapy, and chemotherapy, should not be treated as a taboo subject. Individuals experiencing menopausal symptoms deserve the same support and understanding from their employers as any other employee dealing with an ongoing health condition. Women are encouraged to initiate conversations about issues affecting their ability to work with their line managers, supervisors, or designated individuals when experiencing menopausal challenges.

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HYPERCALCEMIC CRISIS DUE TO PRIMARY HYPERPARATHYROID: A CASE REPORT

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ABSTRACT

Primary hyperparathyroidism is a disease, is seen 0.4-82 /100.000, is diagnosed late because it causes multiorgan involvement such as eyes, bones, kidneys and causes various symptoms related to the central nervous system, gastrointestinal system, cardiovascular system, and if left untreated, it can lead to serious complications and death. Hypercalcemic crisis caused by hyperparathyroidism is an unusual condition of markedly progressive primary hyperparathyroidism and can be fatal.

We present a female patient admitted to the hospital with hypercalcemic crisis as the first symptom of primary hyperparathyroidism.

A 72-year-old female patient with hypertension and chronic kidney disease was admitted to our hospital due to headache, myalgia, nausea, vomiting and confusion. Physical examination GCS: 12 and blood pressure: 180-100mm/Hg. ECG: QT is long. In laboratory evaluation cre: 1.97 corrected calcium: 15.2mg/dl P: 2.9 mg/dl PTH: >2500 ng/L. In her anamnesis, it was learned that she had widespread myalgia and nephrolithiasis for months. The patient was given intra venous hydration, loop diuretics, cinacalcet, hemodialysis treatments. On thyroid ultrasonography and scintigraphy detected a parathyroid adenoma (47.3*26.7*38.5 mm). The patient after the acute medical treatment, was referred to an advanced center for surgical treatment.

As a result, primary hyperparathyroidism is a disease that is the third most common among endocrinological diseases and can cause serious morbidity and mortality if left untreated. Due to multisystem involvement and unspecific symptoms, diagnosis of patients may be delayed and patients may be admitted to the hospital with potentially fatal conditions. For this disease, whose complications can be prevented with early diagnosis, systemic interrogation and comprehensive laboratory evaluation are very important in patients presenting with vague complaints such as dyspepsia, myalgia, arthralgia, fatigue, and decreased consciousness functions.

KEYWORDS: hypercalcemia, primary hyperparathyroidism, parathyroid.

THE USE OF THE ELECTROENCEPHALOGRAM (EEG) BETA RANGE AS A DYNAMIC BIOMARKER FOR ASSESSING THE SEVERITY OF AUTISTIC SYMPTOMS

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ABSTRACT

Examining the brain electrical activity of individuals with Autism Spectrum Disorder (ASD) using Electroencephalography (EEG) is one of the simplest and accessible methods. EEG spectral analysis is utilized to reveal regions dominated by different forms of activity that reflect the balance of arousal and inhibition processes. The aim of this study is to evaluate the usability of EEG spectral features as a dynamic biomarker for autism. This evaluation aims to reflect the severity of autistic symptoms by examining correlations between EEG spectral features and the ADOS-2 (Autism Diagnostic Observation Schedule-2) score. The included children in the research exhibited varying degrees of autism symptoms, with ADOS-2 scores ranging from 5 to 10. Positive correlations between ADOS-2 scores and spectral power values were identified based on various derivations. Particularly, fundamental correlations in the beta range indicated that higher beta activity levels corresponded to stronger autistic symptoms. These findings support the use of spectral power in the beta range as an indicator of a gradient deterioration in the balance of arousal and inhibition in the pathogenesis of autism. Therefore, in situations where behavioral changes are challenging to determine, the dynamic use of spectral power in the beta range may be reasonable. The relative spectral power of EEG in the beta range can positively correlate with the severity of autistic symptoms as reflected by the ADOS-2 score, serving as a dynamic biomarker.

KEYWORDS: Autism, ADOS-2, EEG in autism.

ELEKTROENSEFALOGRAM (EEG) BETA ARALIĞININ OTİSTİK BELİRTİLERİN ŞİDDETİNİ DEĞERLENDİRİLMESİNDE DİNAMİK BİR BİYOBELİRTEÇ OLARAK KULLANIMI

ÖZET

Otizm spektrumu bozukluğu (OSB) olan bireylerin beyin elektrik aktivitesinin EEG (elektroensefalografi) kullanılarak incelenmesi, en basit ve erişilebilir yöntemlerden biridir. EEG spektral analizi, uyarılma ve inhibisyon süreçlerinin dengesini yansıtan farklı aktivite formlarının hâkim olduğu bölgeleri ortaya çıkarmak için kullanılır. Bu çalışmanın amacı, EEG spektral özelliklerinin otizmin dinamik bir biyobelirleyici olarak kullanılabilirliğini değerlendirmektir. Bu değerlendirme, EEG spektral özelliklerin ADOS-2 (Autism Diagnostic Observation Schedule-2) puanı ile olan korelasyonlarını inceleyerek otistik belirtilerin şiddetini yansıtmayı amaçlamaktadır. Araştırmaya dahil edilen çocuklar, otizm belirtilerinin farklı derecelerini sergileyen bireylerdi ve ADOS-2 puanları 5 ile 10 arasında değişmektedir. Çeşitli derivasyonlara göre ADOS-2 puanı ile spektral güç değerleri arasında pozitif korelasyonlar belirlendi. Özellikle beta aralığındaki temel korelasyonlar, yüksek beta aktivitesi düzeyinin otistik belirtilerin daha güçlü olduğu anlamına geldiğini gösterdi. Bu bulgular, otizmin patogeneğinde uyarılma ve inhibisyon dengesindeki gradyanlı bozulmanın göstergesi olarak

beta aralığındaki spektral güç kullanımını desteklemektedir. Bu nedenle, davranışsal düzeydeki değişikliklerin zor belirlendiği durumlarda, beta aralığındaki spektral gücün dinamik bir gösterge olarak kullanılması mantıklı olabilir. Beta aralığındaki EEG'nin göreceli spektral gücü, ADOS-2 puanı ile pozitif korele olarak otistik belirtilerin şiddetini yansıtabilir, bu da dinamik bir biyobelirteç olarak hizmet edebilir.

ANAHTAR KELİMELELER: Otizm, ADOS-2, Otizmde EEG.

INTRODUCTION

Autism spectrum disorders are among the most common developmental disorders, affecting up to 1 in 59 individuals (Baio J., Wiggins L., 2014). In the ICD-10 classification (WHO, 1994), they are represented by several nosological units, such as childhood autism (F84.0), atypical autism (F84.1), and Asperger's syndrome (F84.5). However, in the next edition of the classification (ICD-11), there is a trend to consolidate various subtypes of autism into a single diagnostic category-autism spectrum disorder (6A02).

Autism is characterized by significant heterogeneity of manifestations, but all individuals with this diagnosis exhibit impairments in social interaction, communication, and display stereotypical and repetitive forms of behavior, which emerge in early childhood (Lai M.C., Lombardo M.V., Baron-Cohen S., 2014). In 10–30% of cases, the cause of autism has a known genetic nature (Vorstman J.A.S., Parr J.R., Moreno-De-Luca D., Anney R.J.L., Nurnberger J.I. Jr., Hallmayer J.F., 2017), but the pathogenetic mechanisms in both cases with identified mutations and in idiopathic autism require further investigation.

There is no biological test for autism, and diagnosis is based on behavioral manifestations and information from parents. To reduce the subjectivity of behavior assessment and interpretation of child development data, standardized methods for detecting and diagnosing autism have been developed. These methods are available to both psychiatrists and other professionals in medical and psycho-pedagogical fields. The "gold standard" for autism diagnosis is considered to be the "Autism Diagnostic Interview- Revised" (ADI-R) (Giunti O.S.; Rutter M., Le Couteur A., Lord C., 2014) and the "Autism Diagnostic Observation Schedule- Second Edition" (ADOS-2) (Lord C., Rutter M., DiLavore P., Risi S., Gotham K., Bishop S.L., Luyster R.D., Guthrie W., 2016). These involve detailed interviews with parents and direct observation protocols of the behavior of the child, adolescent, or adult. ADOS-2 includes 10–15 tasks in which the examinee may or may not demonstrate social initiatives and reactions, assessed by the interviewer based on specific criteria. Ratings in the areas of "Speech and Communication," "Social Interaction," "Play and Creativity," "Stereotyped and Repetitive Forms of Behavior," and "Other Forms of Behavior" are transferred to an algorithm and compared with threshold values for diagnostic groups "autism" and "autism spectrum." For children of nursery age, instead of diagnostic groups, the level of concern for development disorders in the autism spectrum is determined (Sorokin A.B., Davydova E.Y., 2017).

In addition to the diagnostic group based on ADOS-2 results, the degree of severity of autistic manifestations is determined on a ten-point scale. This method allows assessing how pronounced the manifestations are in a specific subject compared to other individuals with autism of the same age and expressive language level. Unlike the "raw" ADOS-2 score, the comparative score is calibrated and thus serves as a more stable indicator of individual characteristics of the subjects (Gotham K., Pickles A., Lord C., 2009). Depending on the

comparative score value, the degree of severity of autistic manifestations is classified as "high," "moderate," "low," and "minimal (absence of symptoms)." In parallel with the work to improve diagnostic tools based on the analysis of behavioral manifestations, the search for biomarkers of autism continues. One promising method in this regard is the resting electroencephalogram (EEG) (Heunis T.M., Aldrich C., de Vries P.J., 2016) (Yasuhara A., 2010). It allows you to record biopotentials, summing up the activity of groups of neurons, from the surface of the subject's head with high time resolution. The subject is required to be willing to cooperate by closing his eyes for a few minutes. The recording is subjected to visual analysis, which reveals information about the presence of pathological forms of activity, including epileptiform, which is of particular importance due to the high comorbidity of autism and epilepsy (Buckley A.W., Holmes G.L., 2016). Spectral analysis of EEG allows for the identification of areas with a predominance of specific forms of activity, reflecting the balance of excitation and inhibition processes (Canadian Agency for Drugs and Technologies in Health; 2014). The main spectral characteristic of EEG is spectral power, recorded in individual (one-hertz narrow frequency bands) or standard frequency ranges: delta (up to 4 Hz), theta (4–7 Hz), alpha (7–13 Hz), beta (13–30 Hz) — often subdivided into beta-1 (13–20 Hz) and beta-2 (20–30 Hz) subranges — and gamma (above 30 Hz). At the group level, this digital parameter can be compared between groups and subjected to correlation analysis with other parameters, including behavioral assessment results.

Studies on the spectral characteristics of resting EEG in autism are limited, and the obtained results sometimes contradict each other (Devitt N.M., Gallagher L., Reilly R.B., 2015). For example, among the described EEG features in autism, there are data on both an increase in theta activity levels (Coben R., Clarke A.R., Hudspeth W., Barry R.J., 2008) (Pop-Jordanova N., Zorcec T., Demerdzieva A., Gucev Z., 2010) and a decrease compared to values in typically developing peers (Shephard E., Tye C., Ashwood K.L., Azadi B., Asherson P., Bolton P.F., McLoughlin G., 2018). The most frequently documented change is an elevated level of activity in "fast" ranges — beta and gamma (Gurau O., Bosl W.J., Newton C.R., 2017). This is associated with a shift in the balance of excitation and inhibition in the central nervous system towards excitation, mediated by changes in the GABAergic system (Wang J., Barstein J., Ethridge L.E., Mosconi M.W., Takarae Y., Sweeney J.A., 2013).

The aim of the study was to identify the correlation between the ADOS-2 comparative score, reflecting the degree of severity of autistic manifestations in cognitive and affective spheres, and the spectral characteristics of EEG to assess the possibility of their use as a dynamic biomarker for autism.

METHODS

The study included 18 children with a diagnosed "childhood autism" (ICD-10 code F84.0), of whom 12 were boys and 6 were girls. The average age of the participants was 5.3 ± 1.5 years. The study was conducted following the Helsinki Declaration (2013) and approved by the Ethics Committee of the Volga Research Medical University. Informed consent was obtained from the parents of the patients.

Fifteen patients demonstrated speech in the form of separate words or a lack of verbal communication. They were examined using Module 1 of ADOS-2. Three children had formed phrase speech, and during the examination, tasks from Module 2 were administered to them. The severity of autistic manifestations was assessed using the ADOS-2 comparative score,

calculated based on the "raw" score adjusted for age and expressive speech level. EEG recording was performed using an electroencephalograph-analyzer EEGA-21/26 "Enzefalan-131-03" ("Medicom MTD", Russia). Recording was carried out from 19 electrodes (Fp1, Fp2, F7, F3, Fz, F4, F8, T3, C3, Cz, C4, T4, T5, P3, Pz, P4, T6, O1, O2) located according to the standard "10–20" system. The sampling frequency was 250 Hz. Filtering parameters of the original signal: high-frequency filter cutoff- 0.5 Hz, low-frequency filter- 70 Hz, network frequency rejection filter- 50 Hz. Impedance values did not exceed 10 kΩ. Artifact-free segments of the recording underwent fast Fourier transform, the results of which were presented as values of spectral power. To minimize individual differences within the group, relative values of spectral power in standard frequency ranges — delta, theta, alpha, and beta — as well as in narrow ranges with a 1 Hz step were included in further analysis. Correlation analysis was conducted using Spearman's rank correlation coefficient between spectral power values and comparative scores. Correlation coefficients greater than 0.413 ($p < 0.05$) were considered significant. The results were presented in the form of tables of correlation coefficient values for EEG leads and narrow or standard frequency ranges, as well as tables of p-values. Statistical processing and mapping were performed using the "Neuro-KM" package.

RESULTS

According to the ADOS-2 assessment, 16 children were classified under the diagnostic category of "autism," and two were categorized under "autism spectrum." The comparative score ranged from 4 to 10, indicating a moderate to high degree of autistic manifestations. Clinical characteristics of the children obtained through ADOS-2 are presented in Table 1.

Table 2. Results of examination of children using ADOS-2

N	Diagnostic category according to the ADOS-2 method	Comparative score
1	Autism	7
2	Autism	8
3	Autism	8
4	Autism	9
5	Autism	10
6	Autism	6
7	Autism	7
8	Autism	6
9	Autism	5
10	Autism	8
11	Autism spectrum disorders	4

12	Autism	7
13	Autism spectrum disorders	6
14	Autism	7
15	Autism	7
16	Autism	6
17	Autism	10
18	Autism	6

Correlation analysis between autistic manifestations and spectral parameters of EEG revealed the following feature. The ADOS-2 comparative score positively correlates with the spectral power values at leads F3, Fz, F8, T4, P3 in the beta-1 frequency range ($R=0.425$; 0.421 ; 0.442 ; 0.420 ; 0.445 , respectively; all $p<0.05$), Pz in the beta-2 frequency range ($R=0.436$; $p<0.05$), and borderline- in the Pz area in the beta-1 frequency range ($R=0.412$; $p=0.05$). The results of EEG mapping are presented in Figures 1 and 2.

Figure 1. Correlation of relative spectral power (percentage of the entire range) and comparative ADOS-2 score for leads Fp1, Fp2, F7, F3, Fz, F4, F8, T3, C3, Cz, C4, T4, T5, P3, Pz, P4, T6, O1, O2. The Spearman correlation coefficient values are significantly different from zero: $R>0.413$; $R<-0.413$ ($p<0.05$)

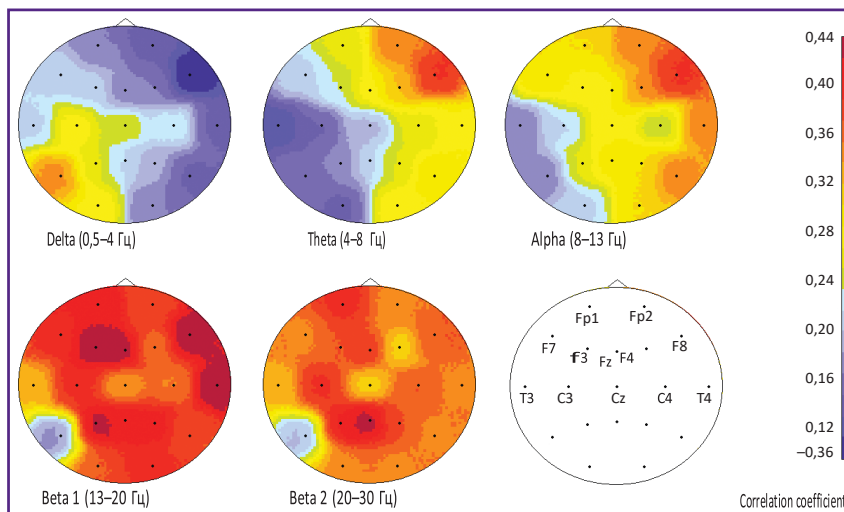
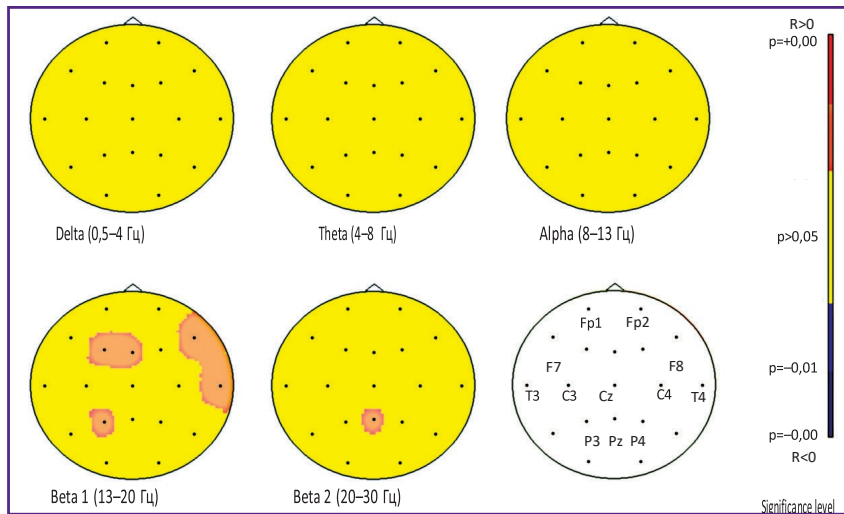


Figure 2. Correlation of relative spectral power (percentage of total band) and ADOS-2 comparative score. Spearman correlation: significance level p with a “+” sign - for positive values of the correlation coefficient $R>0$; with a “-” sign - for negative values of the correlation coefficient $R<0$ for leads Fp1, Fp2, F7, F3, Fz, F4, F8, T3, C3, Cz, C4, T4, T5, P3, Pz, P4, T6, O1, O2



In narrow one-hertz frequency bands, significant Spearman correlation coefficients were found in the frequency ranges of 2–3 Hz (F8), 5–6 Hz (F8, Fp2), 6–7 Hz (F8), 12–13 Hz (F8, Pz, P4, T6), 14–15 Hz (F3, Fz, F8, T4), 15–16 Hz (Fz, F8, T4), 17–18 Hz (F3, Fz, Fp1), 18–19 Hz (F7, P3, P4, O2), 19–20 Hz (F7, Fz, F8, P3, Pz), 23–24 Hz (P3, Pz), 27–28 Hz (Pz), 28–29 Hz (P3, Pz), 29–30 Hz (Fz, P3, Pz). All correlations were positive, and correlation coefficient values are presented in Table 2.

Table 2. Values of the Spearman correlation coefficient between the relative spectral power of the EEG and the comparative ADOS-2 score at significance level $p < 0.05$

Frequency band, Hz	Lead	R value
2–3	F8	0,46
5–6	F8	0,44
5–6	Fp2	0,46
6–7	F8	0,43
12–13	F8	0,45
12–13	Pz	0,43
12–13	P4	0,5
12–13	T6	0,42
14–15	F3	0,44
14–15	Fz	0,43
14–15	F8	0,42
14–15	T4	0,42
15–16	Fz	0,45
15–16	F8	0,47
15–16	T4	0,49
17–18	F3	0,44
17–18	Fz	0,46
17–18	Fp1	0,42
18–19	F7	0,43
18–19	P3	0,42
18–19	P4	0,51
18–19	O2	0,42
19–20	F7	0,44
19–20	Fz	0,42
19–20	F8	0,46
19–20	P3	0,55
19–20	Pz	0,46
23–24	P3	0,45

23–24	Pz	0,43
27–28	Pz	0,45
28–29	P3	0,42
28–29	Pz	0,44
29–30	Fz	0,48
29–30	P3	0,43
29–30	Pz	0,57

When investigating both standard frequency ranges and one-hertz narrow frequency bands of the spectrum, the main correlations were identified in the beta range of EEG. Objective interpretation of correlations between the ADOS-2 comparative score and spectral power in delta and theta frequency ranges is challenging, as they are limited and involve only extreme frontal and temporal areas, which are most vulnerable to motor artifacts.

The association between the severity of autistic manifestations and the most stable EEG spectral characteristics (Gurau O., Bosl W.J., Newton C.R., 2017) indirectly suggests the concurrent validity of both diagnostic tools. Neurophysiological and behavioral data indicate that the higher the level of beta activity in EEG, the more pronounced the autistic manifestations. This suggests a graded involvement of the imbalance between excitation and inhibition in the pathogenesis of autism, potentially justifying the use of EEG spectral power in the beta range as a dynamic indicator when behavioral changes are difficult to establish.

DISCUSSION AND CONCLUSION

This study shows for the first time the relationship between the severity of autistic manifestations in the form of a comparative ADOS-2 score and the spectral characteristics of the EEG. The relative spectral power in the beta range correlates positively with the comparative scores, which corresponds to the ideas of increased arousal in the central nervous system in autism. Financing of the research. The work was carried out within the framework of the state task "Identification of predictors of rehabilitation prognosis in motor and cognitive disorders in children with disabilities (cerebral palsy, delayed statomotor and psycho-speech development, etc.)".

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UNSEEN ARCHITECTS, UNHEARD NARRATIVES: REFRAMING WORK-LIFE BALANCE THROUGH THE LENS OF MIGRANT WOMEN PROFESSIONALS

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ABSTRACT

Skilled migration has long been framed through the lens of "brain drain" in sending countries and human capital gain in receiving ones. However, this binary framing overlooks the nuanced experiences of migrants themselves, particularly skilled women navigating work-life complexities. This study challenges this paradigm by focusing on the experiences of Turkish architect women in Amsterdam, employing a multi-layered, interdisciplinary approach that blends feminist and postcolonial critique with critical management studies. Drawing on in-depth interviews with 12 participants, the study investigates the intersection of gender, professional identity, and migration in shaping work-life challenges for these highly skilled women. The findings reveal that migrant architect women navigate not only gendered expectations within the profession but also the complexities of adapting to new socio-cultural and professional landscapes. This adaptation process, marked by intense expectations and a lack of tailored support, intensifies work-life tensions. Beyond individual challenges, the study highlights the need for an organizational lens on work-life balance. It argues that understanding the interaction between individuals and organizations as a multi-faceted phenomenon is crucial to creating inclusive and supportive work environments for migrant women professionals. This interdisciplinary approach contributes to a fuller understanding of skilled migration beyond the "brain drain" narrative, urging management scholars and practitioners to consider the intersectional realities of migrant women within complex professional and social contexts.

KEYWORDS: brain drain, skilled migration, diversity, gender inclusion, feminist critique.

GÖRÜNMEYEN MİMARLAR, DUYULMAYAN ANLATILAR: GÖÇMEN KADIN PROFESYONELLERİN MERCEĞİNDEN İŞ-YAŞAM DENGESİNİN YENİDEN ÇERÇEVELENMESİ

ÖZET

Nitelikli göç uzun zamandır göç veren ülkelerdeki "beyin göçü" ve göç alan ülkelerdeki insan sermayesi kazancı merceğiyle çerçevelenmiştir ancak bu ikili çerçeveleme, göçmenlerin, özellikle de iş hayatındaki karmaşıklıkların üstesinden gelmeye çalışan vasıflı kadınların incelikli deneyimlerini göz ardı etmektedir. Bu çalışma, feminist ve postkolonyal eleştiri ile eleştirel yönetim çalışmalarını harmanlayan çok katmanlı, disiplinler arası bir yaklaşım kullanarak Amsterdam'daki Türk mimar kadınların deneyimlerine odaklanarak bu paradigmaya meydan okumaktadır. Çalışma, 12 katılımcıyla yapılan derinlemesine görüşmelerden yola çıkarak toplumsal cinsiyet, mesleki kimlik ve göçün bu yüksek nitelikli kadınlar için iş-yaşam zorluklarını şekillendirmedeki kesişimini araştırmaktadır. Bulgular, göçmen mimar kadınların sadece meslek içindeki cinsiyetçi beklentilerle değil, aynı zamanda yeni sosyo-kültürel ve

mesleki ortamlara uyum sağlamanın karmaşıklığıyla da mücadele ettiklerini ortaya koymaktadır. Yoğun beklentilerin ve özel destek eksikliğinin damgasını vurduğu bu uyum süreci, iş-yaşam gerilimlerini yoğunlaştırmaktadır. Çalışma, bireysel zorlukların ötesinde, iş-yaşam dengesi konusunda kurumsal bir bakış açısına duyulan ihtiyacı vurgulamaktadır. Bireyler ve kuruluşlar arasındaki etkileşimi çok yönlü bir olgu olarak anlamanın, göçmen kadın profesyoneller için kapsayıcı ve destekleyici çalışma ortamları yaratmak açısından çok önemli olduğunu savunmaktadır. Bu disiplinler arası yaklaşım, vasıflı göçün "beyin göçü" anlatısının ötesinde daha iyi anlaşılmasına katkıda bulunmakta, akademisyenlerin ve uygulayıcıların karmaşık mesleki ve sosyal bağlamlar içinde göçmen kadınların kesişen gerçekliklerini dikkate almaya teşvik etmektedir.

ANAHTAR KELİMELEER: beyin göçü, vasıflı göç, çeşitlilik, toplumsal cinsiyet katılımı, feminist eleştiri.

A FRESH BREATH OF AIR: ANTONIA LOUISA BRICO

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ABSTRACT

This study aims to introduce the name of Antonio Louisa Brico (1902-1989) the first recognized and known female orchestra conductor (maestra) in the Classical Music World. She had a dream of becoming an orchestra conductor from an early age. Despite WWII, the great depression, and gender discrimination she succeeded in proving herself as a conductor. She was the first female and American to enter the Berlin Music Academy (Hochschule für Musik) and complete her MA. She was not given a chance to conduct any classical orchestras, therefore, she established an orchestra of female musicians bearing her name. She was supported in her endeavors by Elenore Roosevelt. Brico later conducted the Berlin and New York Philharmonic Orchestras. She became an inspiration not only to her contemporaries but to the generations of female musicians to come after her. She stressed the importance of being a musician in the first place. She is known to say that “either you are born and musician or you are not born a musician. Gender has nothing to do with it”. Today there are festivals, and concerts to commemorate and honor her by New York and Denver Philharmonic Orchestras.

KEYWORDS: Female orchestra conductor, Antonia Louisa Brico, Classical Music.

YENİLİKÇİ BİR MAESTRA: ANTONIA LOUISA BRICO

ÖZET

Bu çalışma Klasik Batı müziği dünyasında tanınan ve kabul edilen kadın orkestra şeflerinden (maestra) olan Antonia Louisa Brico'nun (1902-1989) müzikal yolculuğuna ışık tutmayı hedeflemiştir. Hollanda'nın Rotterdam kentinde dünyaya gelen Brico altı yaşına geldiğinde koruyucu ailesiyle Amerika Kaliforniya'ya göç eder. Küçük yaşından itibaren orkestra şefi olma hayali kuran Brico, döneminde gerçekleşen 2.Dünya savaşı, büyük buhran ve cinsiyet ayrımcılığına rağmen kendini kanıtlayan bir şef olmuştur. Berlin devlet müzik akademisine (Hochschule für Musik) giren ve yüksek lisans eğitimini tamamlayan ilk Amerikalı sanatçı olmuştur. Orkestra yönetilmesine izin verilmeyen Brico, kendi soy adını taşıyan Brico Senfoni Orkestrası'nı kurmuştur. Bu orkestra Elenore Roosevelt tarafından desteklenmiştir. Berlin Filarmoni Orkestrası ve New York Filarmoni Orkestrası gibi dünyaca ünlü orkestraları yöneten ilk kadın orkestra şefi olan Antonia Louisa Brico, yalnızca dönemi için değil kendinden sonra gelecek nesillere de ilham olan bir sanatçıdır. Müziğin kadın-erkek ayrımcılığından daha çok insan olma değerlerine önem veren sanatçı bu fikrini “ya müzisyen olarak doğmuşsun ya da bir müzisyen olarak doğmamışsın. Cinsiyetle alakası yok” şeklinde belirtmiştir. Besteciye onurlandırmak için her sene yönettiği orkestralar olan New york Filarmoni Orkestrası ve Denver Filarmoni Orkestrasında festivaller ve gala geceleri düzenlenmektedir.

ANAHTAR KELİMELER: Kadın orkestra şefleri, Antonia Louisa Brico, Klasik Batı Müziği.

THE RIGHT-HAND TECHNIQUE IN VIOLIN EDUCATION

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ABSTRACT

In terms of technique, the violin, a highly rich instrument, has further developed over the years to elevate its performance to the highest level since its current form. After the completion of the development of the violin, the techniques that emerged over the years presented various challenges. The violin, being the smallest member of the string instrument family, is divided into two factors that should be emphasized from the beginning in professional violin education: the right and left hand techniques. After the development of the violin was completed, the technique of holding the violin bow also began to develop with the emergence of the sonata form in the 16th century and the concerto form in the 17th century. While high positions, double stops, and vibrato in left-hand technique can be challenging in the performance of virtuosic works of the time, right-hand technique plays the most crucial role in producing sound. The first condition for correctly applying right-hand techniques in violin education is holding the bow correctly with the right hand. Various right-hand techniques can be performed with a bow held correctly. This study aims to contribute to musicians' musical expression by explaining Detaché, Legato, Martelé, Staccato, Spiccato, Ricochet, and Col Legno techniques, which are types of bows used in comprehensive violin education to overcome musical structure and technical difficulties that have developed over time, starting from the beginner level.

KEYWORDS: Violin, Bow, Technique.

KEMAN EĞİTİMİNDE SAĞ EL TEKNİĞİ

ÖZET

Teknik bakımdan çok zengin bir enstrüman olan keman, bugünkü haline gelmesinden sonra icracılığını en üst seviyeye çıkarmak için yıllar içinde daha da gelişmiştir. Yaylı çalgılar ailesinin en küçük üyesi olan kemanın gelişimi tamamlandıktan sonra, yıllar içinde çeşitli zorlukları barındıran teknikler ortaya çıkmıştır. Sağ ve sol el olarak ikiye ayrılan keman teknikleri, profesyonel keman eğitiminde başlangıçtan itibaren üzerinde önemle durulması gereken iki faktördür. 16. Yüzyıldan sonra sonat formu ve beraberinde 17. yüzyılda konçerto formunun gelişmesiyle keman tutuş tekniği de gelişmeye başlamıştır. Sol el tekniğindeki yüksek pozisyonlar, çift sesler ve vibrato, dönemin virtüözite gerektiren eserlerinin icrasında zorlayıcı bir etken olurken, sağ el tekniği sesin üretilmesindeki en önemli roledir. Keman eğitiminde sağ el tekniklerinin doğru şekilde uygulanabilmesinin ilk koşulu, sağ el ile yayı doğru şekilde tutmaktır. Doğru şekilde kavranan yay ile çeşitli sağ el teknikleri icra edilebilir. Bu çalışmada, kapsamlı keman eğitiminde zaman içinde gelişen müzikal yapı ve teknik zorlukları aşmak için başlangıç seviyesinden itibaren kullanılan yay çeşitlerinden olan Detache, Legato, Martele, Staccato, Spiccato, Ricochet, Col Legno teknikleri anlatılarak icracılara müzikal anlatım konusunda katkı sağlanması hedeflenmiştir.

ANAHTAR KELİMELER: Keman, Yay, Teknik.

NUMERICAL INVESTIGATIONS INTO THE PRIMITIVITY AND SOLUBILITY OF DIHEDRAL GROUPS OF DEGREES $4p$ AND THAT ARE NOT p -GROUPS

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ABSTRACT

Let p be a prime number excepts 2 and G a finite permutation group on Ω , where Ω is a non empty finite set with n elements where n is $\{1, 2, \dots, 4p\}$. This work explores the primitivity and solubility properties of permutation groups of degrees $4p$, focusing specifically on groups that do not belong to the class of p -groups. The study employs a numerical approach to analyze the structural characteristics of these permutation groups, shedding light on their intricate algebraic properties. The method adopted uses some Group theoretic concepts such as orbit of an element $x \in \Omega$ under group actions, stabilizer of an element $g \in G$, Sylow theorems and other established results to determine the primitive and soluble nature of finite permutation groups of degrees $4p$. It was found that Dihedral groups of degrees $4p$ are transitive, imprimitive but soluble. These findings contribute to the understanding of permutation groups beyond the conventional scope of p -groups, offering a nuanced perspective on the primitivity and solubility phenomena in the context of degrees $4p$. The numerical results provide valuable data for theoretical considerations and may guide future investigations into the algebraic structures of permutation groups in other degrees and with different properties. The group's conjugacy classes and character tables were computed and examples were supplied to support our findings and finally, computational group theory (GAP) was employed to enhance and validate our work.

KEYWORDS: Algebraic Structure, Permutation Group, Dihedral Group, Character Table, Conjugacy Classes, Primitivity, Solubility.

1. INTRODUCTION

In mathematics, dihedral groups denoted by D_n are the groups of symmetries of a regular polygon, which consist of rotations and reflections (Cameron, (2013)). Dihedral groups are good examples of finite permutation groups and have series of applications especially in sciences and engineering.

Conventionally, we write

$$D_n = \langle r, f \mid r^n = f^2 = 1, fr = r^{n-1}f = r^{-1}f \rangle$$

And we say that D_n is the group generated by the elements r, f subject to the conditions

$$r^n = f^2 = 1; fr = r^{n-1}f = r^{-1}f,$$

and the $2n$ distinct elements of D_n are

$$1, r, r^2, \dots, r^{n-1}, f, rf, r^2f, \dots, r^{n-1}f.$$

Here r is a rotation about the centre of the polygon through angle $2\pi/n$ and f is a reflection about an axis of symmetry of the polygon.

According to (Cameron, 2013) a group is said to solvable if it has a normal series

$$G = G_0 \geq G_1 \geq G_2 \geq \cdots \geq G_n = \{e\} \dots \dots (1)$$

such that each of its factor group

$$\frac{G_i}{G_{i+1}}, \quad 0 \leq i \leq n$$

is an abelian group.

The above series (1) then is referred to as a solvable series of G .

When a group G acts on a set Ω , a typical point α is moved by elements of G to various other points. The set of these images is called the orbit of α under G , and we denote it by $\alpha^G := \{ \alpha^x \mid x \in G \}$. A group G acting on a set Ω is said to be transitive on Ω if it has one orbit and so $\alpha^G = \Omega$ for all $\alpha \in \Omega$. Equivalently, G is transitive if for every pair of point $\alpha, \beta \in \Omega$ there exists $g \in G$ such that $\alpha^g = \beta$. A group which is not transitive is called intransitive.

A permutation group G acting on a non empty set Ω is called primitive if G acts transitively on Ω and G preserves no non trivial partition of Ω . Where non-trivial partition means a partition that is not a partition into singleton sets or partition into one set Ω . In other words, a group G is said to be primitive on a set Ω if the only sets of imprimitivity are the trivial ones otherwise G is imprimitive on Ω .

Transitive and Primitive finite permutation groups can be thought of as the building blocks of finite permutation groups, and questions about finite permutation groups can often be reduced to the primitive case (Fawcett, 2009).

Transitive and primitive permutation groups of special degrees have received much attention in the academic research space. Transitive and primitive p -subgroup of dihedral groups of degree pq , where p, q are any two distinct odd prime numbers were considered by Hamma and Haruna (2009), while more recently, Audu and Hamma (2010) discussed the transitivity and primitivity of all the p -subgroups of dihedral groups of degree at most p^2 using the concept of p -groups. They used the standard program – The Groups, Algorithms and Programming (GAP) to validate their results while Hamma and Aliyu, (2010) worked “On transitive and primitive dihedral groups of degree at most 2^r ($r \geq 2$)”. Also, Hamma and Mohammed (2012) discussed the transitivity and primitivity of all the p -subgroups of dihedral groups of degree at most p^3 . They proved theorems and validate them using the Groups, Algorithms and Programming (GAP). Cai and Zhang, (2015) presented “A Note on Primitive Permutation Groups of Prime Power Degree”. Fengler, (2018) in his published work explored on “Transitive Permutation Groups of Prime Degree” Studies concerning solubility include: Thanos (2006) who proved that *If* $|G| = p^k$ where p is a prime number then G is solvable. In other words every p -group where p is a prime number is solvable; Bello *et al* (2017) used the concept of p -groups to construct locally solvable groups using two permutation groups by Wreath products. Gandi and Hamma, (2019) who investigated solvable and Nilpotent concepts on Dihedral Groups of an even degree regular polygon.

In this paper, we obtain more detailed descriptions of the unique structure of dihedral groups of degree $4p$ that are not p -groups and investigated their primitivity and solubility using numerical approach.

II. MATERIALS AND METHODS

The following preliminary definitions and results were required.

2.1 p -Group

A finite group G is said to be a p -group if its order is a power of p , where p is prime.

2.2 p-Subgroups

Let G be a group. Let H be a subgroup of G . if H is a p -group, then H is a p -subgroup of G .

2.3 Sylow Theorems (Sylow, 1872)

Let G be a finite group of order n .

1. If p is a prime such that p^k is a divisor of $|G|$ for some $k \geq 0$, then G contains a subgroup of order p^k .
2. All Sylow p -subgroups of G are conjugate, and any p -subgroup of G is contained in a Sylow p -subgroup.
3. Let $n = mp^k$, with $(m, p) = 1$, and let n_p be the number of Sylow p -subgroups of G . Then $n_p \mid m$ and $n_p \equiv 1 \pmod{p}$.

2.4 Sylow p-Subgroup (Sylow, 1872)

Let G be a group.

1. If $T \leq G$ and $|T| = p^r$, for some $r \geq 0$, then T is called a p -subgroup of G .
1. If G is finite and $|G| = p^r m$, $r \geq 1$ where p and m are co-prime and $H \leq G$ such that $|H| = p^r$, we say that H is a Sylow p -subgroup of G .

Clearly, a Sylow p -subgroup is maximal among all p -subgroups of G .

According to Sylow theorem, if n divides $|G|$, then G has a subgroup of order n provided that n is a prime power.

This result is a sufficient condition for a subgroup to exist and is one of the basic tools in modern finite group theory.

2.5 Transitivity

A group G is transitive if for every pair of point $\alpha, \beta \in \Omega$ there exists $g \in G$ such that $\alpha^g \in \beta$. A group which is not transitive is called intransitive.

If $|\Omega| \geq 2$, we say that the action of G on Ω is doubly transitive iff for any $\alpha_1, \alpha_2 \in \Omega$ such that $\alpha_1 \neq \alpha_2$ and $\beta_1, \beta_2 \in \Omega$ such that $\beta_1 \neq \beta_2$ there exist $g \in G$ such that $\alpha_1^g = \beta_1, \alpha_2^g = \beta_2$.

The group G is said to be k -transitive (or k -fold transitive) on Ω if for any sequences $\alpha_1, \alpha_2, \dots, \alpha_k$ such that $\alpha_i \neq \alpha_j$ when $i \neq j$ and $\beta_1, \beta_2, \dots, \beta_k$ such that $\beta_i \neq \beta_j$ when $i \neq j$ of k element on Ω , there exists $g \in G$ such that $\alpha_i^g = \beta_i$ for $1 \leq i \leq k$.

2.6 Lemma (Passman, 1968)

Let G be a dihedral group of any order, then G is transitive.

Proof

For given α_i, α_j as any two vertices of the regular polygon with $i < j$, we readily see that $(\alpha_1 \alpha_2 \dots \alpha_i \dots \alpha_j \dots \alpha_n)^{j-i}$ is the rotation about the centre of the polygon through angle $2\pi^c/n$, (where n is the number of edges of the polygon) which takes α to α_j . As such G is transitive

2.7 Some Results On Transitive Groups

Let G be a permutation group on Ω , where Ω is a finite set.

- i. We say that G is $\frac{1}{2}$ -transitive if all the orbits have the same size.
- ii. Suppose that G has just one orbit Ω . then for all $r \in \Omega$, $r^G = \Omega$ and as such for any $\alpha, \beta \in \Omega$ there exists $g \in G$

such that $\alpha^g = \beta$, and G is said to be transitive (or that G acts transitively) on Ω

3. The group G is said to be k -fold transitive (or, simply k -transitive) on Ω if, for any sequences

$\alpha_1, \alpha_2, \dots, \alpha_k$ such that $\alpha_i \neq \alpha_j$ when $i \neq j$; $\beta_1, \beta_2, \dots, \beta_k$ such that $\beta_i \neq \beta_j$ when $i \neq j$ of k elements of Ω , there exists $g \in G$ such that

$$\alpha_i^g = \beta_i \text{ for } 1 \leq i \leq k.$$

Thus, for $k = 2$ we have that for $\alpha_1, \alpha_2, \beta_1, \beta_2$ in Ω with $\alpha_1 \neq \alpha_2, \beta_1 \neq \beta_2$ there exists $g \in G$ such that;

$$\alpha_1^g = \beta_1, \alpha_2^g = \beta_2$$

and we say that G is doubly transitive.

If $k \geq 2$ then k - transitivity implies $(k - 1)$ - transitively.

4. Let G act on itself by right multiplication. Then, $\Omega = G$. If $\alpha = x, \beta = y$ in Ω and we take $g = x^{-1}y$; then

$$\alpha^g = x(x^{-1}y) = y = \beta.$$

and so G is transitive.

Let $H \leq G$ and let G act on right cosets of H in G .

Then G is transitive on $\Omega := (G : H)$. For if $\alpha, \beta \in \Omega$,

then $\alpha = Hx, \beta = Hy$ for some $x, y \in G$, and if we take $g := x^{-1}y$ then we have

$$\alpha^g = (Hx)x^{-1}y = Hy = \beta$$

2.8 Primitivity

A permutation group G is said to be primitive on a set Ω if the only sets of imprimitivity are the trivial ones otherwise G is imprimitive on Ω .

2.9 Theorem

Let G be a transitive permutation group of prime degree on Ω . Then G is primitive

Proof

Now since G is transitive, it permutes the sets of imprimitivity bodily and all the sets have the same size. But $\Omega = \cup |\Omega_i|, \Omega_i$ being the sets of imprimitivity. As $|\Omega|$ is prime we have that either each $|\Omega_i| = 1$ or Ω or the only sets of imprimitivity. So, G is primitive.

2.10 Theorem (Passman, 1968).

Let G be a non-trivial transitive permutation group on Ω . Then G is primitive if and only if $G_\alpha, \alpha \in \Omega$ is a maximal subgroup of G or equivalently G is imprimitive if and only if there is a subgroup H of G properly lying between $G_\alpha (\alpha \in \Omega)$ and G .

Proof

Suppose G is imprimitive and Ψ a non-trivial subset of imprimitivity of G .

$$\text{Let } H = \langle g \in G | \Psi^g = \Psi \rangle$$

Clearly H is a subgroup of G and a proper subgroup of G because $\Psi \subset \Omega$ and G is transitive.

Now choose $\alpha \in \Psi$. If $g \in G$ then $\alpha \in \Psi \cap \Psi^g$ and so $\Psi = \Psi^g$.

$$\text{Hence } G_\alpha \leq H \leq G$$

Since $|\Psi| \neq 1$, choose $\beta \in \Psi$ such that $\beta \neq \alpha$. By transitivity of G , there exists some $h \in G$ with $\alpha^h = \beta$ so that $h \in G_\alpha$. Now $\beta \in \Psi \cap \Psi^h$, so $\Psi = \Psi^h$ and $h \in H - G_\alpha$. Thus $H \neq G_\alpha$

Conversely, suppose that $G_\alpha < H < G$ for some subgroup H .

$$\text{Let } \Psi = \alpha^H. \text{ Since } H > G_\alpha |\Psi| \neq 1$$

Now if $\Psi = \Omega$, then H is transitive on Ω and hence $|\Omega| = |H : G_\alpha|$ showing that $H = G$, a contradiction.

Hence, $\Psi \neq \Omega$

Now we shall show that Ψ is a subset of imprimitivity of G .

Let $g \in G$ and $\beta \in \Psi \cap \Psi^g$ then $\beta = \alpha^h = \alpha^{hg}$ for some $h, h \in H$.

Hence $\alpha^{hgh^{-1}} = \alpha$. so $hgh^{-1} \in G_\alpha < H$

This shows that $g \in H$

Thus $\Psi = \Psi^g$. Hence Ψ is a non-trivial subset of imprimitivity

So G is imprimitive.

2.11 Theorem

A group G is solvable if and only if it has a solvable series.

Proof

Suppose G is solvable. Then by the definition of “solvable,” in the derived series of commutator subgroups we have $G^{(n)} = (1)$, for some $n \in \mathbb{N}$. In the series $G > G^{(1)} > G^{(2)} > \dots > G^{(n)} = (1)$, we have that $G^{(i+1)}$ is normal in $G^{(i)}$ and $G^{(i)}/G^{(i+1)}$ is abelian. So the series is subnormal (because each subgroup is normal in each previous subgroup) and is also solvable (since the quotient groups are abelian).

Now suppose $G = G_0 > G_1 > \dots > G_n = (1)$ is a solvable series. Then G_i/G_{i+1} is abelian (by definition of solvable series) for $0 \leq i \leq n-1$. $G_{i+1} > (G_i)'$ for $0 \leq i \leq n-1$. Since in the derived series of commutator subgroups we have $G > G^{(1)} > G^{(2)} > \dots > G^{(n)}$, then

$$G_1 > G_0' = G' = G^{(1)}$$

$$G_2 > G_1' = (G^{(1)})' = G^{(2)}$$

$$G_3 > G_2' = (G^{(2)})' = G^{(3)}$$

$$G_{i+1} > G_i' = (G^{(i)})' = G^{(i+1)}$$

$$G_n > G_{n+1}' = (G^{(n-1)})' = G^{(n)}$$

But $G_n = (1)$ so it must be that $G^{(n)} = (1)$ and G is solvable.

2.12 Corollary

Let G be a finite group and H a Sylow p -subgroup of G . Then H is the only Sylow p -subgroup of G if and only if H is normal in G .

Proof:

By Sylow theorem, the Sylow p -subgroups of G are the elements of the sets $\{g^{-1}Hg \mid g \in G\}$ and this reduces to a singleton set if and only if $g^{-1}Hg = H$ for all $g \in G$; that is precisely when H is normal in G .

2.13 Corollary (Thonas, 2006)

If $H \trianglelefteq G$ and $\left| \frac{G}{H} \right| = p$ or p^2 then $\frac{G}{H}$ is abelian

2.14 Proposition (Thonas, 2006)

Let G be solvable and $H \leq G$. Then

1. H is solvable.
2. If $H \triangleleft G$, then G/H is solvable.

Proof

Start from a series with abelian slices. $G: G_0 \triangleright G_1 \triangleright \dots \triangleright G_n = (1)$ Then $H = H \cap G_0 \triangleright H \cap G_1 \triangleright \dots \triangleright H \cap G_n = \{1\}$. When H is normal, we use the canonical projection $\pi: G \rightarrow G/H$ to get $G/H = \pi(G_0) \triangleright \dots \triangleright \pi(G_n) = \{1\}$; the quotients are abelian as well, so G/H is still solvable.

III. RESULTS AND DISCUSSION

3.1 Proposition

Let G be a dihedral group of degree $4p$, where p is an odd prime number. Then G is (i) imprimitive and (ii) soluble.

Proof

That G is transitive follows easily from Lemma 2.6. Next name the vertices of G as $1, 2, 3, \dots, 4p$ and let l be the line of symmetry joining the middle of the vertices 1 and $4p$ with the middle of the vertices $\frac{4p}{2}$ and $\frac{4p+2}{2}$ so that

$$\alpha = (1, 4p)(2, 4p-1)(3, 4p-2) \dots \left(\frac{4p}{2}, \frac{4p+2}{2}\right)$$

is the reflection in l (as in figure 1).

Then $G_1 = \left\{ (1), (2, 4p-1)(3, 4p-2) \dots \left(\frac{4p}{2}, \frac{4p+2}{2}\right) \right\}$ is the stabilizer of the point 1 . We readily see that $G_{(1)}$ is a non-identity proper subgroup of G which has

$$H = \left\{ (1), (1, 4p), (2, 4p-1), (3, 4p-2), \dots, \left(\frac{4p}{2}, \frac{4p+2}{2}\right), \alpha \right\}$$

as a subgroup properly lying between G_1 and G , that is, $G_1 < H < G$. Thus by virtue of Theorem 2.10, G is imprimitive, proving (1).

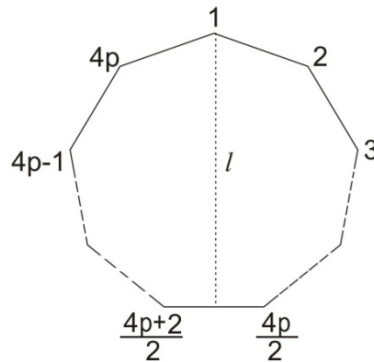


Figure 1: Diagram for Dihedral Groups of Degree $4p$.

(ii) Now, the order $|G| = 2(4p) = 8p$.

$|G| = 2^3 \cdot p$ implies G consists of Sylow 2-subgroups ($\text{Syl}_2(G)$) of order 8 and Sylow p -subgroups ($\text{Syl}_p(G)$) of order p .

Going by Theorem 2.3, the number of Sylow 2-subgroups in the group G namely $N_2 = |\text{Syl}_2(G)| \equiv 1 \pmod{2}$ and divides p . Clearly $N_2 = 1$ or p . It follows that $\text{Syl}_2(G)$ is not unique and hence not normal in G .

Also, by Theorem 2.3, the number of Sylow p -subgroups in the group G namely $N_p = |\text{Syl}_p(G)| \equiv 1 \pmod{p}$ and divides 8. Clearly $N_p = 1$. Thus, it follows that $\text{Syl}_p(G)$ say K is unique of order p and consequently normal in G by Corollary 2.12. K is Solvable by Theorem 2.13. Also, since $|G:K| = 2^3$, the factor group G/K is a p -Group and hence Solvable by theorem 2.13. Therefore G is solvable By Theorem 2.14 as required.

Example (12):

Let $\Omega = \{1,2,3,4,5,6,7,8,9,10,11,12\}$. Then, $G = D_{12}$ the dihedral group of degree 12 acting on Ω is (i) imprimitive and (ii) soluble.

We used GAP package to get the group G and show it is imprimitive and soluble as follows:

GAP 4.11.1 of 2023-04-26

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└─ GAP ─┘ https://www.gap-system.org
Architecture: x86_64-pc-cygwin-default64-kv7
Configuration: gmp 6.2.0, GASMAN, readline
Loading the library and packages ...
gap>
gap> # Dihedral Group of Degree 4p Where p = 3
gap>
gap> G := DihedralGroup(IsGroup,24);
Group([ (1,2,3,4,5,6,7,8,9,10,11,12), (2,12)(3,11)(4,10)(5,9)(6,8) ])
gap> Order(G);
24
gap> Elements(G);; (See Appendix D)
gap> IsTransitive(G);
true
gap> IsPrimitive(G);
false
gap> IsSolvable(G);
true
gap> NG := NormalSubgroups(G);; (See Appendix D)
gap> Size(NG);
9
gap> Elements(NG);; (See Appendix D)
gap> CCG := ConjugacyClasses(G);; (See Appendix D)
gap> List(CCG, x -> Order(Representative(x)));; (See Appendix D)
[ 1, 2, 2, 12, 6, 4, 3, 12, 2 ]
gap> S2 := SylowSubgroup(G,2);; (See Appendix D)
gap> Order(S2);
8
gap> IsNormal(G,S2);
false
gap> S3 := SylowSubgroup(G,3);; (See Appendix D)
gap> IsNormal(G,S3);
true
gap>

```

(i) Now $|G| = 24$ and $\Omega = \{1,2,3,4,5,6,7,8,9,10,11,12\}$ is the set of points of G . We readily see from Lema 2.3 that G is transitive as $\alpha^G = \Omega \ \forall \alpha \in \Omega$.

The stabilizer of the point 1 in G is $G_1 = \{(1), (2,12)(3,11)(4,10)(5,9)(6,8)\}$ which is obviously a non-identity proper subgroup of G . We readily see from the list of subgroups of G that the group G has a subgroup $H = \{(1), (2,12)(3,11)(4,10)(5,9)(6,8)\}$,

$(1,7)(2,8)(3,9)(4,10)(5,11)(6,12)\}$ properly lying between G_1 and G . that is, $G_1 < H < G$. Thus by virtue of Theorem 2.10, G is imprimitive.

(ii) Now, $|G| = 24 = 2^3 \cdot 3$ implying G consists of Sylow 2-subgroups ($\text{Syl}_2(G)$) of order 8 and Sylow 3-subgroups ($\text{Syl}_3(G)$) of order 3.

Going by Theorem 2.3, the number of Sylow 2-subgroups in the group G namely $N_2 = |\text{Syl}_2(G)| \equiv 1 \pmod{2}$ and divides 3. Clearly $N_2 = 1$ or 3. It follows that $\text{Syl}_2(G)$ is not unique and hence not normal in G .

Also, by same Theorem 2.3, the number of Sylow 3-subgroups in the group G namely $N_3 = |\text{Syl}_3(G)| \equiv 1 \pmod{3}$ and divides 8. Clearly $N_3 = 1$ or 4. It follows that $\text{Syl}_3(G)$ is unique in G . However, the order of G , that is, $|G| = 24 = 2^3 \cdot 3$ is of the form $2^k \cdot 3$ where $k \geq 2$ hence G is Solvable by Lemma 2.11 as required.

CONCLUSION

The purpose of this research was to carry out further study on primitive and soluble permutation groups of certain degrees. In particular, the ultimate goal was to determine the primitive and soluble nature of finite permutation groups of degree $4p$ that are not p -groups using numerical approach. This entails generating dihedral groups of these degree, studying, investigating and analyzing them so as to determine their primitivity and solubility properties.

To do this, we set out specific objectives which were achieved as follows:

- i) All dihedral groups of degree $4p$ that are not p -groups were shown to be imprimitive but soluble.
- ii) The results in (i) above was validated using examples and a standard program namely Groups, Algorithms and Programming (GAP) version 4.11.1 of 2021.

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A SOLUTION SEMIGROUP TO A CONFORMABLE PARTIAL DIFFERENTIAL EQUATION

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ABSTRACT

For $I = [0, \infty)$, let X be the space $C_0(I, \mathbb{C})$ of all complex-valued continuous functions on I satisfying $\lim_{x \rightarrow \infty} f(x) = 0$ with $\|f\|_\infty = \sup_{x \in I} |f(x)|$. In this paper, we investigate the solution semigroup to the conformable partial differential equation:

$$\frac{\partial u}{\partial t} = \frac{\partial^\alpha u}{\partial x^\alpha} + h(x)u, \quad 0 < \alpha \leq 1,$$

$$u(0, x) = f(x) \text{ with some } f \in X.$$

Where h is a bounded continuous function on I .

KEYWORDS: Conformable fractional derivative, Semigroup.

THE DETERMINANT OF INTENTION TO USE ONLINE FOOD DELIVERY SERVICES IN MEKONG DELTA VIETNAM

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ABSTRACT

Expanding online food delivery services in developing countries such as Vietnam requires an awareness of consumer demands, product preferences, and consumption habits. This research was conducted in order to evaluate the determinants of Can Tho City residents' intention to use an online food delivery service in the situation of post-Covid 19 pandemic in Vietnam. The research model was based on the Technology Acceptance Model (TAM) and The Unified Theory of Acceptance and Utilization of Technology (UTAUT). The results from an analysis of 207 users indicated that the intention to use an online food delivery service in research area is affected by several important factors, including *effort expectation*, *social influence*, *information quality*, *performance expectation*, and *risk awareness*. This research, therefore, has both academic and practical significance and contribution. It contributes some important points in literature on similar research topics while also providing empirical evidence to assist businesses in identifying new development directions and enhancing customer attraction strategies for online food ordering services in developing countries, especially where affected by Covid-19 pandemic. Based on the findings of the research, it is necessary for the stakeholders to consider appropriate measures, approach to increase the intention to use online food delivery services, enhance the quality of online food delivery services, and aggressively develop e-commerce in the area.

KEYWORDS: Mekong delta, online food delivery, technology acceptance model.

1. INTRODUCTION

Can Tho is one of five central cities in Vietnam which serve as the Mekong Delta's scientific and technical service central for the production and processing of agricultural, forest, and aquatic goods (VietnamPlus, 2022). It is the wealthiest and most rapidly developing city in the Mekong Delta in terms of the processing industry, commercial services, the medical sector, education, science, culture, and tourism. In accordance with the plan laid forth by the government until 2025, Can Tho will develop into a thriving Southeast Asian city while also serving as an essential intra-regional and international transportation hub. The rapid growth of Can Tho as a metropolis is an optimistic sign, and there is no question that this region will soon have the potential to become a vibrant market for the rivalry between various delivery brands and services.

It is evident that online food delivery services are growing in popularity and have become an integral part of people's dining culture. Numerous prominent firms, including as GrabFood, Baemin, Gojet, etc., have joined the market for online delivery services to cater to consumer

demand. When online food delivery applications are filled with promotions, the tough competition among those companies reinforces the habit of utilizing online food delivery services. Not only has there been an increase in the ability to satisfy demand and deliver items to customers, but online ordering has also greatly influenced people's dining practices and drastically altered how they dine.

Despite the fact that the number of Internet delivery providers has expanded tremendously, most of them are located in big cities (such as Hanoi and Ho Chi Minh City), making them inaccessible to most of the population. Expanding online food delivery services into other cities and provinces requires an awareness of consumer demands, product preferences, and consumption habits. This is because the nature of new technologies in each location is different, and they can only adapt to the specifics of that location. Businesses that focus on OFD have a lot of room to grow in a lot of different cities and regions.

2. RESEARCH METHODOLOGY

2.1 Data collection

Participants in the study's poll are seasoned users of online food delivery services in Can Tho City, as well as those who want to do so in the future.

In this study, the sample is selected using the convenience-non-probability technique; that is, the number of surveys is determined by selecting items with uneven probabilities. The researcher will choose aspects from which they have access in order to conduct the desired number of surveys. In addition, with this type of sampling, it is simple for the researcher to contact the respondents because they are prepared to complete the study questionnaire, which reduces the amount of time and money required to collect the necessary data.

The data gathering survey was designed in accordance with the planned study model. The survey is divided into two major sections: general information and evaluation. The initial section contains information on the surveyor. The second section, which pertains to the study article, is the primary section of the survey, which respondents must evaluate using a 5-point Likert scale and 29 questions representing 29 observed factors.

For the process of information collecting, the following survey forms are conducted:

Online: Online surveys are much faster than traditional techniques, and all information is taken automatically, thus information may be acquired more quickly and correctly than by waiting for a paper survey or interview. In addition, the online survey allows respondents to complete questions in private, resulting in more truthful responses and improved outcomes. The survey was created using the Google form tool, then the link was exported and delivered to the primary audience, students and office workers in the city of Can Tho, via Facebook, LinkedIn, Zalo, and email.

Offline: The survey is printed onto survey forms and administered directly to the subjects, who are university students and residents of Can Tho City. Survey questionnaires are issued and collected promptly following the completion of responses.

2.2 Reserach methodology

On the basis of the diverse theories and research models used both domestically and internationally, the following research model is proposed:

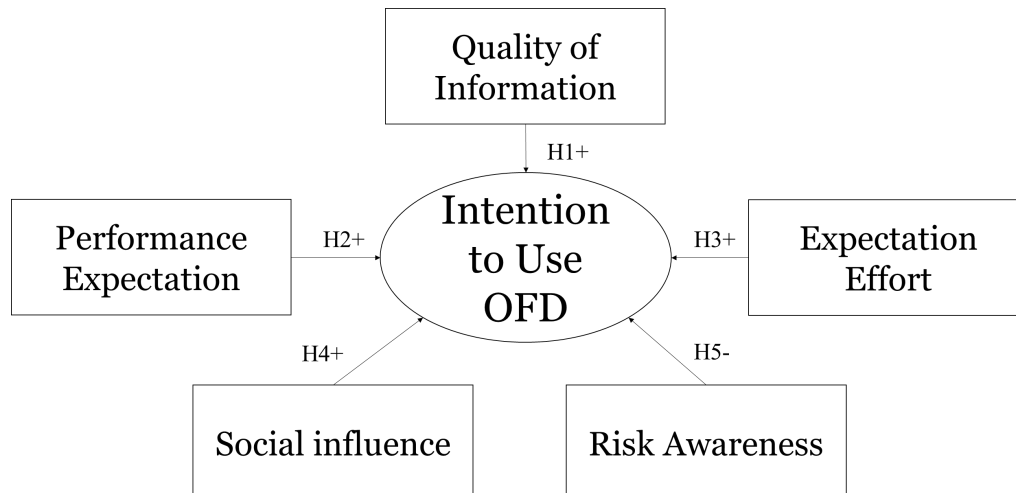


Figure 1: Proposed Framework

EXPLORATORY FACTOR ANALYSIS (EFA)

Before verifying scientific hypothesis, it is vital to assess the scale's validity and reliability. The exploratory factor analysis method (EFA) is a quantitative analysis method that reduces a set of many interdependent measurement variables to a lesser set of variables (called factors) so that they are more significant but still contain most of the information content of the original set of variables (Hair, 2009).

The method of factor analysis EFA, each measure variable is represented as a linear combination of the basic factors, and the amount of variation of each measure variable is explained by the common factors. The overall variability of the measured variables is described by a small number of common factors plus a number of factors specific to each variable.

Conditions for applying the EFA factor analysis method are:

Factor loading > 0.5 , The KMO coefficient must be in the range from 0.5 to 1.0 (KMO value is used to consider the suitability of factor analysis. When the KMO value is large, it is significant for factor analysis. appropriate element).

To use EFA, the KMO must be greater than 0.50 (Kaiser, 1974) recommends:

- $KMO \geq 0.90$: Very Good;
- $0.80 \leq KMO < 0.90$: Good;
- $0.70 \leq KMO < 0.80$: Ok;
- $0.60 \leq KMO < 0.70$: Temporarily;
- $0.50 \leq KMO < 0.60$: Bad;
- $KMO < 0.50$: Unacceptable.

Bartlett's test is statistically significant when $\text{Sig.} < 0.05$ - a statistical quantity that examines the correlation in the population of hypotheses. The observed variables are correlated with each other in the population if the Bartlett's test is statistically significant ($\text{Sig.} < 0.05$)

MULTIPLE LINEAR REGRESSION ANALYSIS

After assessing Cronbach's Alpha and Pearson correlation, we provisionally conclude that the model's components for groups of observed variables are suitable. Assuming that the variables

are correlated after careful consideration of the nature of the potential relationship and establishing a causal relationship between the variables and a selected variable, we can generate a linear regression model with Y as the dependant variable (in this case, the intention to use an online food delivery service) and the remaining variables X as independent variables, in which the implicit assumption is that X causes Y and estimate the variable Y based on X (Ngọc & Trọng, n.d.). In accordance with the aforementioned assumptions, linear regression analysis assists in determining the link between the independent variables and the dependent variable, as well as the degree of influence between them. The form of the model is as follows:

$$Y_i = B_0 + B_1X_{1i} + B_2X_{2i} + \dots + B_pX_{pi} + e_i$$

Contain:

Y_i : Dependent variable

X_{pi} : The value of the pth independent variable at the ith observation.

B_p : Partial regression coefficient

e : A normally distributed random independent variable with a mean of 0 and a constant σ^2 variance.

PARAMETERS R^2 (R-SQUARE) AND ADJUSTED R^2 (ADJUSTED R-SQUARE)

Indicate the degree (%) of the variation of the dependent variable that is explained by the independent variable. The range of these two values is from 0 to 1. The value of R^2 depends on the number of variables in the model, that is, the more variables there are in the model, although it has not been determined whether the input variable is significant or not. then the value of R^2 will increase. What are unexplained lies in the residuals. Meanwhile, the adjusted R^2 does not depend on the number of variables in the model. Therefore, the adjusted R^2 is a better coefficient to evaluate the fit of the multiple regression model. The closer the adjusted R^2 is to 1, the more suitable the model is, and vice versa, the closer this value is to 0, the less suitable the model is to the harvested sample (Thọ, n.d.).

F - value:

Shows the fit of the linear regression model, considered in the ANOVA analysis table. The linear regression model is considered suitable and usable when the sig value of the F-test is smaller than 0.05.

THE VALUE OF SIG (P-VALUE) OF THE ANOVA TABLE

The value of Sig (P-value) of the ANOVA table is used to evaluate the fit of the model. The p-value is called the observed significance level, which is the maximum probability of making a type 1 error when rejecting the null hypothesis H_0 . If Sig is small (usually less than 0.05), the model exists.

SIG. OF T-TEST:

Sig. value of the regression coefficient of an independent variable is less than 0.05, we conclude that the independent variable has an impact on the dependent variable.

T-TEST:

Is used to test the mean difference in the case of a qualitative variable with 2 values to determine whether there is a difference in the mean of the quantitative variable for different values of a qualitative variable or not.

ANOVA TEST:

Overcomes the limitation of T-test, helps to test the mean difference for qualitative variables from 3 or more values.

3. DISCUSSION

3.1 Overview of the use of online food delivery services in Can Tho City

Can Tho is a city directly under the Central Government, located in the center of the densely populated and bustling Mekong Delta, with a location that is regularly accreted by the Hau River and other rivers, so that the soil is relatively fertile and the tropical monsoon climate is stable, which is very favorable for the development of agriculture, cultivation, livestock, and fisheries. Therefore, the cuisine here is fairly robust and replete with West-side elements.

Industrial and Commercial Facilities and The Young Entrepreneurs Association of Can Tho City recently inked a cooperation agreement on e-commerce in September 2022, demonstrating that Can Tho is a Mekong Delta commercial growth hub with great potential. Some Can Tho enterprises have also revealed their e-commerce internet business experiences.

According to Mr. Ha Vu Son, Director of Can Tho's Department of Industry and Commerce, speaking at the beginning of the Conference, it is hoped that this conference on integrating electricity trade in the Mekong Delta region will provide businesses with an opportunity to network. Localities can conduct research and receive direct guidance from e-commerce platforms, construct online brands as well as digital solutions and online payments to assist enterprises and cooperatives in establishing new distribution channels. Can Tho is the online central market in the Mekong Delta area, and it has the potential to become a hub for production, trade, and e-commerce in the context of regional ties between production enterprises and cooperatives.

Can Tho city have an average level of biodiversity with agroecosystems and natural wetlands that include dunes and islets (Khuong Island, Son Island, Tan Loc Island, and dunes Au, Cai Khe Islet). It is hard to ignore the growth of ecotourism in Phu Sa, Cai Rang, and several other forms of river and water in relation to Can Tho. Therefore, the air quality in Can Tho city is fairly acceptable, and standard urban transport has enabled Can Tho become an attractive and new tourist destination for many tourists following the pandemic, as well as a long-term trend. With the above-mentioned advantages of Can Tho city, it can be seen that, based on our real observations, young people here, particularly university students and young people, travel to the workplace with tourists and take use of online food delivery services throughout the day. Now, Baemin, and Grab are the most popular online food delivery apps in the city of Can Tho. Especially for parents and the elderly The majority of people in Can Tho do not use internet food delivery services since they prefer to prepare their meals themselves. Young people's use of online meal delivery services in the city of Can Tho tends to expand, although it takes more time to become familiar with the users

3.2 Descriptive statistics

After selecting and eliminating inappropriate answers, the author used SPSS 20.0 software to analyze and process demographic factors, which are detailed in Table 4.2 below:

	Frequency	Frequency%
Gender		
Male	49	23,7
Female	158	76,3
Total	207	100,0
Average Income		
Under 5 million VND	53	25,6
From 5 million VND - 10 million VND	75	36,2
From 10 million VND - 15 million VND	62	30,0
Over 15 million VND	17	8,2
Total	207	100,0
Age		
From 18 to 22 years old	40	19,3
From 23 to 28 years old	76	36,7
From 29 to 34 years old	73	35,3
35 - 41 years old	18	8,7
Total	207	100,0
Literacy		
University/ College	192	92,8
Graduate	15	7,2
Total	207	100,0

Table 1: Survey sample statistics

From the statistical results of the survey sample on demographic factors including gender, average income, education level and age, some typical characteristics of each group are shown as follows:

First, for gender, there is a significant difference between male and female proportions among the 207 survey respondents. It can be seen that the proportion of female people is nearly 3 times higher than male gender with 158 survey participants, accounting for 76.3%. Meanwhile, the number of male participants is 49 people, accounting for 23.7%. There is a big difference between the male and female gender ratio with 52.6%.

3.3 Linear regression results

With the close relationship between the dependent variable and the independent variables in the above model, the author continued to carry out the multiple regression model with the dependent variable (Intention to use online food delivery) and the remaining 5 independent variables are shown in the following regression equation. In order to be able to evaluate the order of impact of the independent variables in order to give appropriate solutions, the author uses a standardized regression equation of the form:

$$CI = \beta_0 + \beta_1 \times IQ + \beta_2 \times PE + \beta_3 \times EE + \beta_4 \times SI + \beta_5 \times RA + \mu$$

Model Rating

In order to evaluate the model, the author analyzes and uses the results of the adjusted coefficient R^2 cause its accuracy is higher than the coefficient R^2

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate	Change Statistics					Durbin-Watson	
					R Change	Square F Change	df1	df2	Sig. Change	F	
1	0,888 ^a	0,788	0,784	0,27516	0,788	223,634	6	361	,000	1,728	

a. Predictors: (Constant), JS, LDS, WSB, WOE, ATT, OFP

b. Dependent Variable: WOP

Table 2: Model Summary

Based on the summary results from the table Model Summary show R^2 corrected by $0.784 > 0.5$ (meaning $78.4\% > 50\%$). Thus, it can be concluded that the independent variables in the above model explain 78.4% of the change of the dependent variable Intention to use online food delivery services. The remaining 21.6% is due to factors outside the model proposed by the author and possibly due to the influence of random error.

	Model	Sum of Squares	Df	Mean Square	F	Sig.
	Regression	43.741	5	8.748	79.360	.000 ^b
1	Residual	22.157	201	.110		
	Total	65.898	206			

a. Dependent Variable: CI

b. Predictors: (Constant), RA, IQ, EE, SI, PE

Table 3: ANOVA

From the results of the ANOVA table above, we can check the fit of the model and the variables included in the model based on the Sig value. and F value to reject or accept the hypothesis H_0 .

Set Hypothesis 0 mean: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5$ (In case all regression coefficients are equal 0). Then, combined with the results of the ANOVA table, it shows the Sig. value = $0.000 < 0.05$ and F value = 79.360, so we reject H_0 . Thus, we can conclude that the above regression model is built completely in accordance with the selected data set and the variables included in the model are relatively suitable for analyzing and evaluating the results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	1.502	0.314		4.789	.000		

IQ	0.146	0.037	0.191	3.893	.000	0.696	1.437
PE	0.185	0.053	0.173	3.477	.001	0.678	1.475
EE	0.237	0.040	0.290	5.972	.000	0.708	1.413
SI	0.211	0.037	0.276	5.701	.000	0.716	1.396
RA	-0.139	0.032	-0.210	-4.303	.000	0.706	1.417

a. Dependent Variable: CI

Table 0: Coefficients

Based on the results of the Coefficients table, the author conducts important tests before giving a suitable regression equation for the study. The first is multicollinearity through the VIF value. VIF (Variance Inflation Factor) is the coefficient of variance, if the VIF values of the variables in the model are all less than 2, it shows that the research model does not have multicollinearity. Next, the author tests the statistical significance of the independent variables based on the results of the Sig value. in the Coefficients table, with the condition Sig. are all less than 0.05. Finally, evaluate the impact of the independent variables in the research model. To get the regression equation of the model, we can use the results of the unstandardized regression coefficients B (Unstandardized Coefficients) and the standardized regression coefficients (Standardized Coefficients). However, in order to conclude the level of impact of the independent variables in the model to provide suitable solutions, the study uses the standardized regression coefficient Beta due to the uniformity of units and degrees of accuracy. Standard deviation of variables participating in the regression model helps to evaluate and measure in the most practical way.

4. CONCLUSTIONS AND RECOMMENDATIONS

This study formed a research model by generalizing the theoretical foundation and prior investigations in response to the stated research topic. The research involved interviewing 207 consumers in Can Tho City. They are seasoned clients who desire to utilize Can Tho City's internet food delivery services. Both the online survey and the printed survey form are printed into a survey form after data collection. This investigation employs both qualitative and quantitative research approaches. Quantitative technique, the study collects sample data, then analyses Cronbach's Alpha coefficient, exploratory factor analysis, and multiple linear regression to determine the validity of the scale and the research model. IBM SPSS 20.0 software was used to process data. The findings of this study indicate that the intention to use online meal delivery services in Can Tho City is impacted by five factors: *Effort Expectancy*, *Social Influence*, *Performance Expectancy*, *Information Quality* and finally *Risk Awareness*.

Based on the above analysis results, the author proposes some managerial implications to improve the experience of using the online food ordering service, thereby helping consumers in Can Tho City to have a better experience. Convenient, interesting and modern experience ensures a more urban life.

- Enhance development and improve ease of use on the online food ordering app.
- Promote promotional communication to attract users to trust and use the online food ordering application.
- Enhancing the development of features that increase user performance when using online food ordering applications.

- Support the middle-aged group in order for them to quickly adopt and absorb new technology.
- Enhance the development of information quality when features increase performance (convenience, speed, time saving, ...) for users when using online food ordering applications.

Ensuring the correct product quality as described on the application, offering a suitable return policy, etc.) when consumers employ the application

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AN EXAMINATION OF WOMEN PARTICIPATION IN THE CONSTRUCTION INDUSTRY: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

The construction industry, marked by its historical male dominance, continues to face a substantial gender gap, prompting concerns over gender equality, diversity, and inclusivity. This systematic literature review examines the persistent underrepresentation of women in the construction industry, examining the intricate interplay of societal, organisational, and economic factors that influence their roles and advancement. A critical analysis of 22 selected articles was used to comprehensively examine women's challenges in this traditionally male-centric field. The findings underscore enduring societal norms, organisational barriers, and economic disparities, particularly in wages, as substantial hurdles impeding the full integration of women into the construction industry. These crucial obstacles raise critical questions about gender parity and the need for inclusive practices. Additionally, the study delves into empowerment strategies, media representations, and the impact of diversity initiatives on women's participation. Exploring these aspects reveals insights that contribute not only to theoretical advancements in gender studies but also offer practical interventions. This review's nuanced insights offer a foundation for future research, policy-making, and industry practices that foster greater gender inclusivity. The study presents timely and critical contributions in the context of ongoing discussions on workforce diversity and equality. The research aims to mitigate the barriers and create an environment conducive to active and meaningful women's participation in the construction industry by providing actionable insights.

KEYWORDS: Construction Industry, Diversity Initiatives, Gender Equality, Gender Inclusivity, Workforce Diversity, Women in Construction.

PUBLIC-PRIVATE PARTNERSHIPS IN AFFORDABLE HOUSING PROVISION: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Public-private partnerships (PPPs) have emerged as a critical mechanism in providing affordable housing addressing the global challenges associated with housing inadequacies. This systematic literature review delves into the intricate dynamics and challenges inherent in implementing PPPs, drawing insights from a meticulous analysis of 14 selected articles from the Scopus database. The review highlights the multifaceted nature of the housing crisis, emphasising the significance of effective governance, regulatory frameworks, and stakeholder collaboration in shaping sustainable and inclusive housing policies. It underscores the essential role of political commitment and pragmatic intelligence in driving successful housing initiatives, underlining the need for robust PPPs to ensure the availability of affordable housing. Addressing funding constraints, regulatory incentives, and socio-cultural dynamics are critical factors in fostering resilient and equitable housing solutions. Additionally, the review emphasises the significance of energy-efficient models, sustainable financial mechanisms, and community-centred approaches in promoting environmentally conscious and inclusive housing projects. The synthesis of critical findings underscores the evolving landscape in the affordable housing domain, emphasising the imperative for integrated and collaborative approaches that harness the expertise of the public and private sectors. This review provides valuable insights for policymakers, practitioners, and researchers engaged in developing and implementing effective housing strategies globally.

KEYWORDS: Public-private partnerships, Affordable housing, Housing provision, Housing policy, Governance, Stakeholder collaboration.

1.0 INTRODUCTION

The persistent challenges surrounding affordable housing have become a critical concern globally, with a widening gap between the supply of adequate housing and the growing demand, particularly among low- and moderate-income households. As identified in the literature, this issue has underscored the need for innovative and collaborative strategies, leading to an increased reliance on public-private partnerships (PPPs) as a potential solution (Bashir *et al.*, 2023; Alteneiji *et al.*, 2020a,b; Qin *et al.*, 2017). As collaborative frameworks between the public and private sectors, PPPs have gained prominence for their potential to address the intricate and multifaceted nature of affordable housing provision.

Housing provision has traditionally fallen under the purview of the public sector, with governments primarily responsible for ensuring access to adequate housing for their citizens. The limitations of traditional public sector approaches have become increasingly apparent, with challenges arising from funding constraints, bureaucratic inefficiencies, and a lack of specialised expertise in real estate development and management (Qin *et al.*, 2017). In response, PPPs have emerged as an alternative approach, aiming to harness the strengths and resources

of both the public and private sectors to facilitate the development, financing, and management of affordable housing initiatives.

The significance of PPPs in addressing affordable housing challenges extends beyond their potential to mobilise additional financial resources. PPPs can foster innovation in housing design, construction, and management, introducing new technologies, sustainable practices, and community-centred approaches that align with diverse populations' evolving needs and preferences (Batra, 2023). By promoting the integration of social and environmental sustainability goals into housing projects, PPPs can create long-term value and positive social impacts within communities.

However, implementing PPPs in the affordable housing sector is not without challenges. (Fell & Mattsson, 2017) highlight some critical issues, including the complexities of aligning divergent objectives and priorities between public and private stakeholders, as well as the risks associated with ensuring the long-term affordability and accessibility of housing units. Additionally, regulatory frameworks, institutional capacities, and the political dynamics within different contexts can significantly influence the effectiveness and sustainability of PPPs in housing provision (Mohammed *et al.*, 2017).

Against this backdrop, this paper aims to comprehensively review the existing literature on the role and impact of PPPs in affordable housing provision. By critically analysing the current body of knowledge, this study seeks to elucidate the underlying mechanisms, challenges, and opportunities associated with using PPPs in addressing affordable housing needs. Furthermore, the paper will offer insights into the best practices, lessons learned, and potential policy implications that can enhance the efficacy and sustainability of PPPs in the context of affordable housing provision. The subsequent sections of this paper will provide a detailed examination of the key findings from the literature review, followed by a critical discussion of the implications for policy and practice in affordable housing provision through PPPs.

2.0 PUBLIC-PRIVATE PARTNERSHIPS IN HOUSING PROVISION

2.1 Definition and Types of Public-Private Partnerships

Public-private partnerships (PPPs) represent collaborative arrangements between government entities and private sector actors to address complex societal challenges, including the provision of affordable housing. Tan and Zhao (2019) identified significant PPP models, including BOT (Build-Operate-Transfer), BOO (Build-Own-Operate), TOT (Transfer-Operate-Transfer), ROT (Rehabilitate-Operate-Transfer), and O&M (Operation and Management Contract). By pooling resources, knowledge, and expertise, these diverse models enable the equitable sharing of risks and rewards between public and private stakeholders. This collaborative approach fosters the development of affordable housing units with improved efficiency, financial sustainability, and broader social impact, ultimately promoting inclusive and sustainable communities.

2.2 Historical Context and Evolution of PPPs in Housing Provision

The historical evolution of PPPs in housing provision reflects the dynamic interplay between public policy and governance approaches over time. A public-private partnership was viewed as an innovative approach to public service and policy (Batjargal and Zhang, 2022). Initially developed in Anglo-Saxon nations (Chen & Man, 2020), it has proliferated across Europe, Asia, Africa, and beyond. According to Dechev (2015), the roots of public-private partnerships trace back to 19th-century Europe, credited to Alfred Eiffel. He financed and constructed the Eiffel Tower, gaining the right to issue visitor tickets over the following two decades. Eiffel's pioneering concept found increased traction in economies experiencing development. This shift was driven by recognising the limitations of traditional public sector interventions and the growing emphasis on the importance of private sector participation in achieving sustainable and

inclusive housing development. The subsequent expansion of PPP initiatives in the early 21st century further underscored the evolving role of PPPs as an essential mechanism for fostering collaboration, innovation, and long-term sustainability in the housing sector.

2.3 The Role of Government in Affordable Housing Provision

Effective government involvement remains instrumental in shaping the landscape of affordable housing provision through PPPs. Kalu *et al.* (2021) emphasise the critical role of government interventions in establishing a conducive regulatory environment, providing financial incentives, and implementing supportive land-use policies. However, the nature and extent of government involvement vary across different contexts. Many factors, including political ideologies, institutional capacities, and the socio-economic conditions specific to each region, influence them. The strategic alignment of government policies and actions with the objectives of PPPs is crucial for fostering a collaborative and enabling environment that facilitates sustainable and equitable housing development.

2.4 Challenges and Benefits of PPPs in Affordable Housing Provision

Despite their potential benefits, implementing PPPs in affordable housing provision is not without challenges. Batra (2021) highlights several key challenges, including the complexities of reconciling divergent public and private interests, ensuring the long-term affordability and accessibility of housing units, and managing the risks associated with financial investments and project delivery. These challenges often stem from the inherent complexities of navigating the diverse priorities, expectations, and operational dynamics of public and private sector stakeholders within affordable housing provision. On the other hand, the benefits of PPPs encompass increased access to private sector expertise, enhanced financial viability, and the promotion of innovation in housing design and construction practices. By leveraging the unique strengths of both sectors, PPPs have the potential to drive transformative change, foster sustainable urban development, and contribute to the creation of resilient and inclusive communities.

2.5 Success Stories and Best Practices of PPPs in Affordable Housing Provision

Several successful cases of PPPs in affordable housing provision have demonstrated the positive impact of collaborative efforts between the public and private sectors. Alteneiji *et al.* (2020b) emphasise the significance of solid partnerships, transparent governance mechanisms, and favourable and efficient legal frameworks in ensuring the successful delivery of integrated housing solutions prioritising social inclusivity, environmental sustainability, and community engagement. These success stories underscore the importance of fostering strategic collaborations that leverage the complementary strengths and resources of both sectors, ultimately leading to the development of sustainable, affordable, and inclusive housing projects that cater to the diverse needs of communities.

3.0 METHODOLOGY

The systematic literature review was conducted to identify and analyse relevant scholarly articles on PPPs in affordable housing provision. The search process was initiated by formulating a comprehensive search string to ensure the retrieval of pertinent and recent literature. The search string used was as follows: "TITLE-ABS-KEY (public private AND partnerships AND in AND affordable AND housing AND provision) AND PUBYEAR > 2012 AND PUBYEAR < 2024 AND (EXCLUDE (LANGUAGE, "Spanish")) AND (LIMIT-TO (DOCTYPE, "ar"))". The search was primarily conducted using the Scopus database (see Figure 1), renowned for its extensive coverage of peer-reviewed literature across various disciplines. The inclusion criteria encompassed articles published between 2013 and 2023,

ensuring the retrieval of recent and up-to-date literature. Moreover, the exclusion criterion was applied to exclude articles published in Spanish, focusing solely on articles published in English to maintain consistency and facilitate comprehension during the review process. The search strategy was designed to retrieve articles explicitly addressing the various dimensions of public-private partnerships in affordable housing provision. The selected articles were expected to offer insights into the definitions, types, challenges, benefits, and best practices associated with implementing PPPs in affordable housing. Furthermore, the search aimed to identify articles that presented empirical evidence, theoretical frameworks, case studies, or policy analyses, thereby contributing to a comprehensive and nuanced understanding of the topic. Upon executing the search string in the Scopus database, the initial search results were systematically screened based on the relevance of titles and abstracts to the predefined scope of the literature review. The screening process was followed by a detailed examination of the full texts of the identified articles to assess their suitability for inclusion in the review. Articles that met the inclusion criteria were carefully analysed and synthesised to extract pertinent information, key findings, and critical insights that contributed to the overall objectives of the paper.

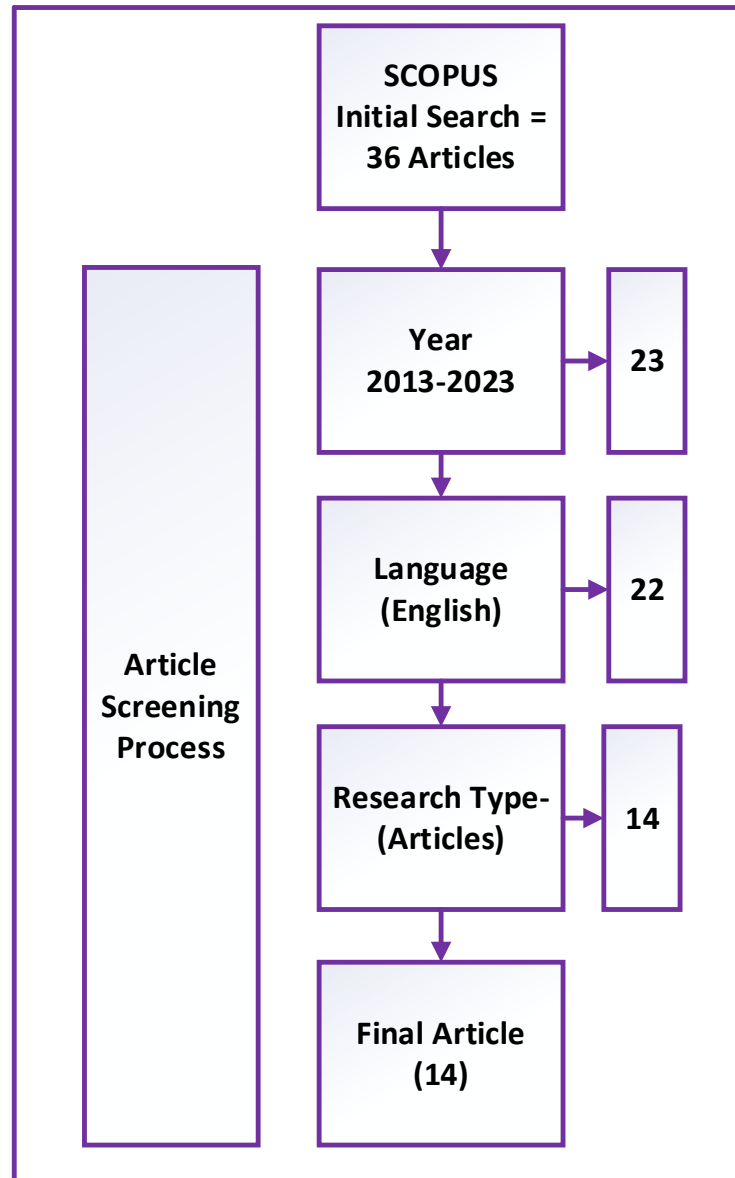


Figure 1: Article Selection Process

4.0 FINDINGS

4.1 Overview of the selected articles

The amalgamation of research from the 14 selected articles yields a comprehensive understanding of the multifaceted landscape surrounding the implementation of public-private partnerships (PPPs) in affordable housing provision. These studies offer critical insights into the challenges and potential strategies for addressing housing inadequacies across various socio-economic and geographical contexts. Notably, a thematic analysis conducted by Mohammed *et al.* (2017) underscores the imperative role of political commitment and practical intelligence in the effective execution of housing policies, highlighting the significance of robust PPPs to ensure the availability of affordable housing. Concurrently, Li and Shamsuddin (2022) comparative study sheds light on the varying policy priorities and program management approaches within the public housing sector, emphasising the dynamic interplay between the public and private domains. Similarly, Batra's examination (2021) of the barriers and challenges

in PPP implementation emphasises the structural, contextual, and financial complexities that necessitate policy-level interventions.

Additionally, Ahmed and Sipan (2019) exploration delves into critical factors influencing the successful implementation of PPPs for affordable housing in Nigeria, emphasising the importance of addressing funding constraints, legal frameworks, and the accessibility of local building materials. Moreover, the articles collectively underscore the significance of incorporating energy-efficient models (Antonini *et al.*, 2016; Bashir *et al.*, 2023) and sustainable financial frameworks (Savinova *et al.*, 2016; Ogunnaiké *et al.*, 2013) in the development and execution of affordable housing projects. The studies further highlight the crucial role of regulatory incentives and community-focused initiatives (Rehman and Naeem, 2017; Marantz, 2015) in fostering inclusive housing solutions. Additionally, the research emphasises the importance of addressing socio-cultural contexts and mistargeted beneficiaries to mitigate housing vacancies in subsidised housing projects (Adianto and Gabe, 2021). The overarching trends elucidated across the reviewed articles underscore the evolving nature of PPPs in the affordable housing domain, emphasising the need for collaborative and holistic approaches that integrate the expertise of the public and private sectors to address complex challenges and ensure sustainable and inclusive housing provision.

4.2 Thematic analysis of the literature on PPPs in affordable housing provision

Thematic analysis of the literature on PPPs in affordable housing provision emphasises several critical themes and trends. Firstly, a recurrent theme is the significance of effective governance and regulatory frameworks in facilitating successful PPPs. Studies consistently highlight the importance of transparent and efficient governance structures that enable collaboration between the public and private sectors, ensuring accountability and equitable distribution of resources for affordable housing initiatives. Secondly, the literature underscores the vital role of financial mechanisms and funding accessibility in enabling sustainable housing provision. Researchers emphasise the need for innovative financing models, including the involvement of multiple stakeholders, such as financial institutions, philanthropic organisations, and governmental bodies, to address funding constraints and promote long-term affordability in housing projects.

Moreover, the analysis highlights the social and cultural dynamics influencing the implementation of PPPs in affordable housing. Studies underscore the significance of understanding local community needs and preferences and the socio-cultural context to ensure the inclusivity and sustainability of housing interventions. Effective community engagement and participation are critical factors in fostering community-centric housing solutions catering to the diverse needs of different population segments. Furthermore, the thematic analysis emphasises the growing emphasis on sustainability and energy efficiency in affordable housing projects. Researchers highlight the importance of integrating green building practices, energy-efficient technologies, and environmentally friendly designs to reduce carbon footprints and promote sustainable development in the housing sector. The literature underscores the potential of energy-efficient housing initiatives to enhance environmental sustainability and reduce long-term operational costs for residents. Lastly, the analysis points to the emerging trend of collaborative approaches and partnership models in addressing the complexities of affordable housing provision. Studies advocate for holistic strategies that involve active collaboration between diverse stakeholders, including local governments, private developers, non-profit organisations, and community representatives, to create comprehensive and integrated solutions for affordable housing challenges. This collaborative approach aims to leverage the expertise and resources of various entities to overcome the multifaceted barriers and promote sustainable and inclusive housing provision on a global scale.

4.3 Synthesis of key findings and trends in the literature

The synthesis of key findings and trends in the literature on PPPs in affordable housing provision underscores several crucial aspects. Firstly, effective governance emerges as a central pillar in the successful implementation of affordable housing projects through PPPs. Robust regulatory frameworks, transparent decision-making processes, and accountability mechanisms are essential in fostering the efficient and equitable distribution of resources and responsibilities between public and private entities. Secondly, the literature emphasises the need for comprehensive policy frameworks that address funding constraints, regulatory incentives, and socio-cultural dynamics. Studies underscore the importance of proactive measures to facilitate funding accessibility, encourage private sector participation, and ensure marginalised communities are included in affordable housing initiatives. Moreover, the synthesis highlights the significance of targeted interventions that address the unique socio-cultural context of diverse communities, thereby promoting more inclusive and sustainable housing solutions.

Furthermore, the synthesis underscores the growing importance of energy efficiency and green housing initiatives in affordable housing provision. Researchers advocate for integrating sustainable building practices, energy-efficient technologies, and environmentally friendly designs to reduce environmental impact and operational costs while enhancing residents' overall quality of living. This trend reflects a broader shift toward sustainable and environmentally conscious housing solutions aligned with global sustainability goals and climate change mitigation efforts. Lastly, the synthesis highlights the increasing focus on collaborative and holistic approaches to address the multifaceted challenges of affordable housing provision. Studies underscore the need for strategic partnerships between stakeholders, including governmental bodies, private developers, non-profit organisations, and local communities, to foster comprehensive and integrated solutions for sustainable and inclusive housing provision. This trend emphasises the importance of leveraging diverse expertise, resources, and perspectives to create innovative and adaptive strategies that effectively respond to the complex and evolving needs of affordable housing on both a local and global scale.

5.0 RECOMMENDATIONS AND IMPLICATIONS

5.1 Recommendations

In order to enhance the efficacy and sustainability of PPPs in the domain of affordable housing provision, several vital recommendations emerge from the identified gaps and areas for further exploration. It is crucial to seamlessly integrate political commitment and pragmatic intelligence into the operational framework of PPPs, thereby ensuring the effective implementation of affordable housing initiatives. Comprehensive regulatory incentives and policy frameworks should be developed to bridge the gap between affordable housing provision and sustainable development goals, fostering resilient and inclusive housing strategies. In-depth research focusing on socio-cultural dynamics influencing housing access and utilisation is essential, emphasising developing targeted programs to address the specific needs of marginalised communities and vulnerable populations. The practical implementation and long-term impact assessment of energy-efficient models and sustainable finance mechanisms should be prioritised to promote housing affordability and environmental sustainability. Furthermore, community engagement and empowerment should be facilitated by implementing community-focused initiatives, allowing communities to participate in housing projects actively and promoting inclusivity and social equity. Lastly, exploring innovative technological solutions and their role in enhancing the efficiency and resilience of affordable housing initiatives is paramount, allowing for the integration of technological advancements in the pursuit of sustainable housing development.

5.2 Implications

The implications of this research extend to various facets of housing policy and practice. Firstly, the findings enrich housing policies, particularly in PPPs for affordable housing provision. This study provides a roadmap for policymakers to develop more effective and sustainable housing strategies by highlighting critical gaps and offering targeted recommendations. Secondly, the emphasis on community engagement and empowerment underscores the importance of inclusive approaches in housing initiatives. The study underscores the significance of community-focused programs, advocating for the active participation of communities in housing projects to foster a sense of ownership and inclusivity.

Moreover, integrating sustainable development goals within affordable housing provision emphasises the potential for housing initiatives to contribute to broader sustainability agendas, encompassing environmental and social sustainability. The study also sheds light on the transformative role of technological innovations in the housing sector, advocating for the integration of cutting-edge solutions to enhance housing efficiency and resilience. Finally, the research underscores the importance of addressing socio-cultural dynamics to ensure equitable housing access for marginalised communities and vulnerable populations. This holistic approach emphasises the need for tailored strategies that cater to the diverse needs of various socio-economic groups, promoting a more equitable and inclusive housing landscape.

6.0 CONCLUSION

This systematic literature review provides a comprehensive overview of the dynamics and challenges surrounding the implementation of PPPs in affordable housing provision. The combination of findings from the 14 selected articles highlights the multifaceted nature of the housing crisis, necessitating a nuanced and collaborative approach that incorporates the expertise of both the public and private sectors. The studies underscore the critical role of effective governance, political commitment, and pragmatic intelligence in successfully executing housing policies, emphasising the need for robust PPPs to ensure the availability of affordable housing. Additionally, the research emphasises the importance of addressing funding constraints, legal frameworks, and the accessibility of local building materials as pivotal factors influencing the efficacy of PPPs in housing provision. Furthermore, the thematic analysis underscores the significance of incorporating energy-efficient models and sustainable financial frameworks in the development and execution of affordable housing projects. The studies further emphasise the need for regulatory incentives, community-focused initiatives, and targeted interventions to address socio-cultural contexts and ensure the equitable distribution of housing resources. Overall, the synthesis of critical findings underscores the evolving nature of PPPs in the affordable housing domain, emphasising the need for collaborative and holistic approaches to effectively address the complex challenges and ensure sustainable and inclusive housing provision for diverse communities worldwide.

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MEDICATION SAFETY AND ERROR PREVENTION

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ABSTRACT

Since the 1999 National Academy of Medicine report, To Err is Human and the 2007 report, Preventing Medication Errors, pharmacies, pharmacists, and pharmacy leaders have increased their focus on improving medication safety in their organizations. Many organizations have created specific positions dedicated to overseeing the analysis of medication errors and implementing medication error prevention strategies for high-risk medications and error-prone processes. With the growth of pharmacy involvement in ambulatory care, increased use of patient simulations, and advances in electronic health record technology, medication safety leaders are advancing the way medication errors are analyzed. Medication safety leaders must navigate the impact of emerging regulations and accreditation standards, drug shortages, and other disruptive forces in healthcare. Pharmacotherapy is a complex process and involves interaction of the patient and the healthcare professionals at various levels. Prevention of medication errors is important however, errors may occur even in a carefully monitored healthcare setup. The outcomes of the errors may range from mild inconvenience to the patient to even fatal toxic reactions. There are several predisposing factors for the occurrence of errors starting from improper drug selection to errors in administration technique by the healthcare providers' and patients. Several methods can be employed to detect the occurrence of errors. At the Manipal Teaching Hospital, Pokhara, Nepal, the Department of Hospital and Clinical Pharmacy has taken the initiative in identifying the error prone situations and has taken remedial measures including educational and managerial interventions to minimize the occurrence of errors. There is a large and growing body of research addressing medication safety in health care. This literature covers the extent of the problem of medication errors and adverse drug events, the phases of the medication-use process vulnerable to error, and the threats all of this poses for patients. As this body of literature is evaluated, the fact that there are crucial areas about which we know little becomes apparent. Nurses are most involved at the medication administration phase, although they provide a vital function in detecting and preventing errors that occurred in the prescribing, transcribing, and dispensing stages. Administration errors comprise a significant proportion of all errors and yet, beyond that fact, there isn't much known about the causes or about the effectiveness of proposed solutions. Research addressing the complex process of medication use in hospitals is badly needed and requires a new approach to produce valid knowledge from studies done in the field with few controls of confounding factors.

KEYWORDS: High risk situation, Medication errors, Quality health services, poly pharmacy.

A SHORT REVIEW ON APPLICATION OF NANOMATERIALS IN THE TREATMENT OF RHEUMATOID ARTHRITIS

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ABSTRACT

Side effects of conventional treatment are few and frequent. Nanotechnology has emerged as a promising approach in the treatment of RA due to the unique properties of nanomaterials. This review explores the use of various nanomaterials, including nanoparticles, liposomes, dendrimers, and hydrogels, in the fight against RA. Nanomaterials have advantages such as targeted drug delivery, improved bioavailability, and reduced bacterial toxicity. They also have the ability to modulate the immune system, fight infection, and regenerate damaged tissue. This review highlights the latest advances in the field of RA nanomedicine with an emphasis on clinical and clinical research. Challenges, including security and regulatory issues, are also discussed. Overall, the use of nanomaterials shows great promise in the treatment of RA; Provide new treatments that promise to increase effectiveness and reduce side effects.

KEYWORDS: Nanotechnology, Nanomaterials, Nanomedicine, Toxicity, Dendrimers.

BILIRUBIN NANOMEDICINE A HOPE FOR THE MANAGEMENT OF COVID-19?

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ABSTRACT

Bilirubin has been proven to possess significant anti-inflammatory, antioxidant and antiviral activities. Recently, it has been postulated as a metabolic hormone. Further, moderately higher levels of bilirubin are positively associated with reduced risk of cardiovascular diseases, diabetes, metabolic syndrome and obesity. However, due to poor solubility the therapeutic delivery of bilirubin remains a challenge. Nanotechnology offers unique advantages which may be exploited for improved delivery of bilirubin to the target organ with reduced risk of systemic toxicity. Herein, we postulate the use of intravenous administration or inhalational delivery of bilirubin nanomedicine (BNM) to combat systemic dysfunctions associated with COVID-19, owing to the remarkable preclinical efficacy and optimistic results of various clinical studies of bilirubin in non-communicable disorders. BNM may be used to harness the proven preclinical pharmacological efficacy of bilirubin against COVID-19 related systemic complications

KEYWORDS: COVID-19, Bilirubin, Biliverdin, Nanomedicine, Anti-inflammatory, Antioxidant.

POSSIBLE EFFECTS OF ARTIFICIAL INTELLIGENCE ON THE GLOBAL ECONOMY IN THE CONTEXT OF KONDRATIEFF WAVES

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“What is dominant in society today is change, constant change, inevitable change. No rational decision can now be made without taking into account not only the world as it is, but also as it will be.”

Isaac Asimov

ABSTRACT

In this study, the point reached by artificial intelligence technology, which is predicted to have a disruptive technology in recent years, to directly affect the financial sector and many other sectors, and which is estimated to take the share of nation-state economies from these developments, has been evaluated in the context of the economy, as the living space of today's people, and has been analyzed in terms of the vital welfare and human development index. PwC's article for Microsoft, titled “AI Will Be a Vital Tool in Making the Global Economy More Sustainable and Efficient”, published in Forbes Magazine, examines how artificial intelligence will lead to a significant reduction in global greenhouse gas emissions, as well as how artificial intelligence can contribute to making the agriculture, water, energy and transportation sectors more sustainable. However, it is indicated that the use of artificial intelligence may contribute 5.2 trillion dollars to the global economy by 2030 by reducing greenhouse gas emissions by 4%.

Although statistical data has a very important place in the comparison of data in international economic analysis, we aim to examine the extent and direction of the change in information and communication technologies to the welfare of nation states and the human development index without drowning our study in data.

KEYWORDS: Kondratieff Waves, Artificial Intelligence, Global Economy, Human Development Index, Industry 4.0.

KONDRATİEFF DALGALARI BAĞLAMINDA YAPAY ZEKÂNIN KÜRESEL EKONOMİYE OLASI ETKİLERİ

“Bugün toplumda baskın olan şey değişim, sürekli değişim, kaçınılmaz değişimdir. Artık sadece dünyayı olduğu gibi değil, olacağı gibi hesaba katmadan hiçbir mantıklı karar verilemez.”

Isaac Asimov

ÖZET

Çalışmamızda son yıllarda yıkıcı bir teknolojiyi barındırdığı, başta finans sektörü ve diğer birçok sektörü doğrudan etkileyeceği öngörülen, bu gelişmelerden ulus devlet ekonomilerimin

de payını alacağı tahmin edilen yapay zekâ teknolojisinin vardığı nokta günümüz insanının yaşam alanı olan ekonomi bağlamında değerlendirilerek, yaşamsal önemi haiz refah ve insani gelişme endeksi özelinde analiz edilmeye çalışılmıştır. PwC'nin Microsoft için hazırladığı ve Forbes Dergisinde yayınlanan "AI Will Be a Vital Tool in Making The Global Economy More Sustainable and Efficient", başlıklı makalede yapay zekânın, küresel sera gazı emisyonlarında önemli ölçüde düşüşe kapı aralayacağı, ayrıca yapay zekanın tarım, su, enerji ve ulaştırma sektörlerinin daha sürdürülebilir olmasına nasıl katkı sunabileceğini incelenmektedir. Bununla birlikte yapay zekâ kullanımının sera gazı emisyonlarını %4 azaltarak 2030'a kadar küresel ekonomiye 5.2 trilyon dolar katkı sunabileceğinin öngörüldüğü belirtilmektedir.

Uluslararası ekonomik analizlerde verilerin karşılaştırılmasında istatistikî veriler çok önemli bir yere sahip olsa da çalışmamızı verilere boğmadan bilgi ve iletişim teknolojilerinde yaşanan değişimin ulus devletlerin refahına ve insani gelişme endeksine ne derece ve ne yönde katkısı olacağını pest analizi yöntemiyle incelemek amacındayız.

ANAHTAR KELİMELER: Kondratieff Dalgaları, Yapay Zeka, Küresel Ekonomi, İnsani Gelişme Endeksi, Endüstri 4.0.

Kondratieff Dalgaları Teorisi

Literatürde, Rus iktisatçı Nikolay Kondratieff adına ithafen bu şekilde anılan ve makro iktisat seviyesindeki ekonomik hareketliliği modellemek için kullanılan dalga teorisidir. Kondratieff Dalgaları teorisine göre tarihi süreçte dünyada beş kondratieff dalgası yaşanmıştır. Yaklaşık 50-60 yıl süren bir dalga genellikle küresel ekonominin durağanlığa başladığı gerileme dönemlerinde yaşanan bir teknolojik devrim veya üretim sistemlerinde(maddelerinde) yaşanan bir değişiklik yeni bir kondratieff dalgasına sebep olmaktadır. Her dalgada emek-kapital ilişkileri yeniden şekillenmektedir. Dünya bugün beşinci dalgayı yaşamaktadır. Altıncı dalga metavers'i mi hızlandıracak?

- 1793-1847(ilk makineleşme kondratieff'i)
- 1848-1893 (buhar gücü ve demiryolları kondratieff'i)
- 1894-1945 (elektrik ve ağır sanayi kondratieff'i)
- 1945-1990 (fordist kitlesel üretim kondratieff'i)
- 1990-... (bilgi ve iletişim kondratieff'i)

Endüstri 4.0-Yapay Zekâ-Küresel Ekonomi ve Ulus Devletlerin Politika Açmazı

Önümüzdeki 30 yılda sera gazı salınımının azaltılması ve uluslararası camiada bu yönde teşvik edici politikalara uyumun artırılması hedeflense de Bilgi ve iletişim teknolojileri, küresel sera gazı emisyonlarının yüzde 3'ünü oluşturuyor. Veri merkezleri, havacılık endüstrisi kadar emisyon salımına neden oluyor ve büyük miktarlarda su tüketiyor. Üstelik yapay zekâ teknolojisinin gelişmesiyle birlikte kullanılan enerji miktarının da artması bekleniyor. Diğer yandan yapay zekâ, geliştirdiği sistemler üzerinden emisyonların azaltılmasına da katkıda bulunuyor. Örneğin Alphabet'in Google'ı ve American Airlines, uçakların küresel ısınmaya etki eden buhar izleri oluşturmasını azaltmak için yapay zekâyı kullanıyor. Google ayrıca nehir taşkınlarını tahmin etmek ve çevre dostu rota önerileri sunmak için de yapay zekâdan faydalıyor. (Yapay Zekâ İklim Krizinde Bir Çözüm mü Yoksa Kriz mi Yaratıyor? ,par.6)

Bununla birlikte bilişim alanında veri madenciliği, tasarım, analiz vb. gibi uzmanlık gerektiren çeşitli teknolojik, profesyonel hizmetlere olan ihtiyaç yeni iş alanlarının doğmasına neden olacaktır. Küresel düzeydeki teknolojik gelişmeyi yakından takip edemeyen ya da oldukça geriden takip eden ülkelerin çekecekleri prefosyonel anlamda yetenek sıkıntısı, kitlesel işsizlik ve gelir dağılımında büyüyen dengesizlik sorunları küresel işsizlikleri artırırken, dünyanın farklı bölgelerinde yoksulluk, göç ve sosyal patlamalara neden olabilecektir. Dünya Ekonomik

Forumu'nun yayınladığı rapora göre teknoloji 2020 yılında 5 milyon işi ortadan kaldıracaktır. 2020 itibarıyla iş bulmada en iyi 10 beceri arasında; karmaşık problem çözümü, kritik düşünme, yaratıcılık, kişisel yönetim, başkalarıyla koordinasyon, duygusal zeka, muhakeme ve karar verme, hizmet uyumu, müzakere, bilişsel esnekliktir. (Dünya Ekonomik Forumu, WEF,2020) Endüstri 4.0'ın istihdam üzerindeki etkisi üretim mesleklerinde "teknik meslekler" dâhil daha az işçi kullanılacakken, hizmet mesleklerinde daha fazla çalışana ihtiyaç duyulacağı yönündedir. Ekonomi 4.0'ı uygulamayan ülkelerin, diğer ülkelere kıyasla (öncü, yurtdışındaki ilave talep, rekabet gücü), imkanlarından mahrum kalıp, üretim düşüşü ve işsizlikte artışa, rekabet gücü kaybı ve iç talebin ithal ürünlere kaymasına maruz kalacakları iddia edilmiştir.

İletişim kuramcısı Mc Luhan; içerikten ziyade aracın yani teknolojinin belirleyici olduğunu söylemiş, teknolojiyi bedenın uzantısı ve dönüştürücüsü olarak yorumlamış, bu bağlamda teknolojiyi toplumsal yaşamın motor gücü olarak değerlendirmiştir. Önemli olan içerik değil, biçim yani araç olarak teknolojinin kendisidir. Chomsky, küresel ekonomik ilişkilerin; yapay bir kültür inşa ettiğine dikkati çekmiştir. Zira bu yapay kültürde; seri, hızlı, ucuz ve farklılaştırılmış üretim mallarının tüketilmesinin nedeni ihtiyaç değildir. Modern toplumda bireylere sahte ihtiyaçlar ve yapay kimlikler sunulur. Böylece bireyler gerçek bir ihtiyaç için değil, ihtiyacın yerine geçen sahte değerler için tüketmiş olur. Bu yapay kültürün geniş kitlelere benimsetilmesinde ise, gelişmiş teknolojiye sahip çok uluslu medya şirketlerinin ve yeni iletişim teknolojilerinin rolü çok önemlidir. Nitekim benzer bir yaklaşımla Baudrillard; modern toplumların sahte bir eşitlik kurguladığını, nesnelerin tüketilmesinin esasen sahte bir toplumsal ve ekonomik konum eşitliği yarattığını ifade eder. (Güngör, 2013,pp371-378)

Kondratieff Dalgaları-Üretim Tarzı-Yeni Yaşam Biçimi Sorunsalı

1945'te dördüncü kondratieff dalgasının sebep olduğu fordist üretim anlayışı; teknik anlamda sanayi üretiminin büyük oranda kitlesel üretim olarak gerçekleştirildiği, idari işler ile kol kuvvetine dayalı işlerin taylorist bir ayrımla belirlendiği, iş bölümünün ve iş tanımlarının katı bir şekilde yapıldığı, ürün standartlaştırmasının verimlilik artışları getirdiği ve artan talebin bu standartlaşmayı hızlandırdığı bir üretim biçimi olarak gerçekleşmiştir. Gramsci tarafından eleştirel bir yaklaşımla yorumlanan fordist üretim tarzı; kapitalist medeniyette yeni bir dönemi başlatan, planlı ekonomiye geçişe damgasını vuran, *yalnızca üretimi değil bireyi de planlayan*, yeni bir işçi (ve insan) tipi yaratmak için hayatının en mahrem alanlarını işgal eden ve bir montaj hattı ile sınırlı kalmayan yaklaşım şeklinde tanımlanmıştır. (Kaymas, 2001, pp.114-117) Burada Gramsci'nin yorumundan hareketle, beşinci kondratieff dalgasının, yani bilgi ve iletişim kondratieff'inin nasıl bir üretim tarzı ve bundan daha önemlisi nasıl bir birey tasarladığı ve bireyler arası iletişimde nasıl bir yöntem izleyeceği sorunsalıdır. Bu iletişim tarzının insani gelişme endeksine ve refaha ne derece katkısı olacağı gerçektir.

Toplumsal üretim biçimlerinin Endüstri 4,0'a entegrasyonu için; "otomasyon, dijitalleşme, yapay zekâ uygulamaları, sayısallaşma, yakınsama, algoritma, mobilizasyon, ARGE, teknoloji yoğun işletmeler" zorunlu bir ihtiyaç haline gelmektedir. Çünkü artık endüstriyel ve kültürel anlamda bir ağ sistemine dönüşüm yaşanmaktadır ve bu ağlara bağlanan cihazların yeni sisteme entegre olması gerekmektedir. (Kayar, Ayvaz, Öztürk, 2019, pp.1655-1656)

Çok boyutlu bir kavram olan insani gelişmenin temel unsurlarını, Birleşmiş Milletler'in İnsani Gelişme Endeksi'ndeki 3 boyut oluşturur. Bu üç temel boyut:

- Bireyin uzun, sağlıklı ve yaratıcı bir hayat yaşaması;
- Bilgi ve eğitim alabilme imkânına sahip olması;
- İnsana yaraşır bir hayat için gerekli kaynaklara ulaşabilmesidir.

Kapitalist genişleme döneminde yani ikinci dünya savaşından sonra kol ve emek gücüne yönelik (Fordist üretim tarzı) ekonomik büyüme günümüz bilgi ve iletişim çağında (Bilgi ve iletişim Kondratieff'i) yerini güvenli bilgi ve veriye bırakmış, artık büyük verinin analiz edilmesi siyasi, ekonomik v.s. politikaların belirlenmesinde önemli bir rol oynamaktadır.

Bunun için kol ve emek gücünden ziyade bilgi ve iletişim sektörlerinde üretim yapan, yaratıcılığı ön planda olan büyük veri mühendisi, veri analisti, iş zekâsı uzmanı gibi profesyonel meslekler revaçta olmaktadır ve bu sektörlerde küresel çapta istihdam açığı bulunmaktadır. Bu nedenle Birleşmiş Milletlerin insani gelişme endeksinde bireylerin bilgi ve eğitim alabilme imkânına sahip olması vurgulanmaktadır.

Bilgi toplumunun oluşması ile son dönemde bilgi ekonomisinde sürekli bir artış görülmüştür. Bu artış bireylerin eğitim düzeylerini artırarak yeni bilgi sahibi olmaları ve toplumun genelinin bilgiye erişiminin sağlanması için faaliyet yürüten ülkelerin çalışmaları sonucu ortaya çıkmaktadır. Ülkelerin eğitim alanında gerçekleştirdikleri teşvikler bireylerin eğitim olanaklarını artırmakta ve küresel ölçekte yetenekli insan topluluklarını ortaya çıkarmaktadır. Eğitim; insanların ekonomik koşullarında iyileşme sağlamak ve istihdam alanında eğitilmiş kişilerin fırsatlarını artırmaktadır (OECD, 2012). Ülkelerin kalkınma seviyelerinin belirlenmesi ve insani gelişmişlik düzeyinin önemli göstergelerinden biri beşeri sermayedir. Beşeri sermaye içerisinde birçok öge barındırmaktadır. Bunlardan iki temel unsur ise eğitim ve sağlıktır. Bir ülkede; eğitim seviyesinin yüksek olması, kalifiye işgücü doğuracağı için ekonomik ve sosyal sonuçlar bakımından kalkınmayı pozitif eğilimle etkilemektedir.

Tablo.1-Ülkelerin 2021 Yılı İnsani Gelişme ve Eğitim Endeksleri

2021 İnsani Gelişme Endeksi Sıralaması	Ülke Adı	2021 İnsani Gelişmişlik Endeksi	2021 Eğitim Endeksi	2021 Yılı ARGE Harcamalarının GSYH İçindeki Payı
1	İsviçre	0.962	0.902	3.15
2	Norveç	0.961	0.912	1.97
6	Danimarka	0.948	0.909	2.81
9	Almanya	0.942	0.917	3.13
15	Kanada	0.936	0.893	1.84
22	İsrail	0.919	0.835	5.44
28	Fransa	0.903	0.762	2.21
33	Yunanistan	0.887	0.777	1.44
34	Polonya	0.876	0.845	1.44
42	Şili	0.855	0.732	0.29
48	Türkiye	0.838	0.680	1.13

Kaynak: UNDP, Human Development Report, 2021/2022

Tablodan da açıkça görüleceği üzere, ülkelerin GSYH'larından arge harcamalarına daha fazla pay ayırması teknolojik bilgiye ulaşmada ve analiz etmede gerekli bilişim personelinin eğitimlerine ağırlık verilmesi insani gelişme ve kalkınmada önemli bir rol oynayacaktır.

SONUÇ

Geçmişten günümüze insanların refah talebi her zaman üretim şekillerine yön vermiştir. Nüfus ve ihtiyaçların her geçen gün artması ve çeşitlenmesi insanları farklı arayışlara mecbur bırakmış ve bu nedenle dönem dönem farklı çözüm arayışları neticesinde toplumlar 4 farklı kondratieff dalgası tecrübe etmiştir. Kondratieff Dalgalarının altında yatan en temel dürtü, artan ihtiyaçlara yeteri kadar cevap verebilmektir. 18. yüzyılda tarımda kullanılan buhar ve su gücü ilk dalga olarak tarihte yerini almıştır. 19. yüzyılın sonlarına doğru artan nüfusla birlikte büyüyen ihtiyaç talepleri farklı arayışlara sebep olmuştur. Elektrik enerjisi ile tanışan dünya, seri üretim ve bantlar vasıtasıyla artan taleplere cevap vermeye başlamıştır. Böylece 2. dalga süreci başlamıştır. 3. Dalga ise 1970'li yıllarda bilişim dünyasında ilk kıpırdanmalarla hissedilmeye başlanmıştır. Gelişen elektronik ve ön dijital devrimle otomasyon sistemleri kurulmuştur. Nihayet 2010'lu yıllarda ise dünya üstel artan nüfus nedeniyle çok farklı bir deneyime şahit olmaya başlamıştır. Bu deneyime Endüstri 4.0 adı verilmektedir.

Endişe dolu bir dünyada yaşıyoruz. Daha fazla insan, neredeyse her ülkede insani gelişmede geri düşüşlere neden olan ve yakın geçmişte varyantları öngörülemeyen bir şekilde yayılmaya devam etmiş olan Covid-19 pandemisi, Ukrayna'da ve başka yerlerde devam eden savaşlar, değişen jeopolitik düzen ve gergin çok taraflı sistemin ortasında acı çekiyor. Her biri bir alarm zili olan rekor kıran sıcaklıklar, yangınlar ve fırtınalar, giderek kontrolden çıkıyor. Akut krizler, küresel ölçekte kronik, katmanlı, etkileşen belirsizliklere yol açıyor, böylece belirsiz zamanların ve huzursuz yaşamların resmini çiziyor. İnsanlığın gelişme uğruna ağır bedeller ödediği geleneksel “ilerleme” fikrini sorguluyor. Öğrenim süresi veya beklenen yaşam süresi gibi bazı alanlardaki kazanımlar, insanların kendi yaşamları üzerindeki kontrol duygusunun kaybedilmesi gibi diğer alanlardaki kayıpları telafi etmez. Ya da, gezegenin sağlığını kaybetmesi pahasına maddi zenginliğin tadını çıkaramayız. (UNDP, İnsani Gelişme Raporu, 2021-2022)

Bu çalışmamız insani gelişmeyi bir amaç olarak değil, belirsiz zamanları aşma yolunda bir araç olarak görmek ve o şekilde anlaşılması gereken bir çalışma olarak değerlendirilmesi ümidiyle kaleme alınmıştır. *Teknoloji insani yetenekler kazanarak insana daha çok yaklaşıırken, insan mekanikleşmekte ve doğasından uzaklaşmaktadır.*

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MONETARY POLICIES IN THE AFTERMATH OF THE GREAT RECESSION

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ABSTRACT

This study provides an overview and a comparative analysis of monetary policies implemented in the global economy in the aftermath of the Great Recession. The 2007-2008 financial crisis, the severe effects of which were aimed to be mitigated by monetary and fiscal authorities all across the world, caused dramatic instability in international financial markets. While stimulus programs were introduced by fiscal authorities in most countries in order to revive economic activity, both conventional and unconventional monetary policies were pursued by central banks in order to combat the global recession. The significance of monetary and fiscal policy coordination was highlighted by the global financial crisis. There were similarities as well as differences across countries with respect to the monetary policies followed during this turbulent period in the world economy. Despite the enormous measures taken by the central banks, the recovery was quite slow, which led to the fact that there were heated discussions about the effectiveness of the implemented policies. Evaluating the consequences of the monetary policies carried out in the global economy during and after the Great Recession plays a key role in designing optimal monetary policy. Through presenting a comprehensive investigation of monetary policies conducted during that critical period of time, this study contributes significantly to the understanding of optimal monetary policy in response to financial crises.

KEYWORDS: conventional monetary policy, unconventional monetary policy, Great Recession.

INTRODUCTION

The Great Recession refers to the economic downturn observed from 2007 to 2009 after the bursting of the U.S. housing bubble and the following global financial crisis. The period known as the *Great Moderation*, during which decreased macroeconomic volatility and relatively mild business cycles were experienced in the U.S., came to an end when the decade-long expansion in U.S. housing market activity and residential construction began declining. The Great Recession is considered as the longest and the deepest economic downturn in many countries since the Great Depression that started in 1929 and dominated the global economy during the 1930s. The recovery period lasted much longer than estimated, which led to repeated extensions of stimulus plans and support programs as well as additional policy measures in many countries across the world.¹

The causes of the Great Recession have been considered as certain vulnerabilities in the financial system accompanied by a series of triggering events that started with the bursting of the U.S. housing bubble in 2007. After the dotcom crash and the 9/11 attacks in 2001, the

¹ For a comprehensive analysis of the role of financial factors in the Great Recession, see, among others, Gertler and Gilchrist (2018).

Federal Reserve pursued expansionary monetary policy, cutting interest rates to the lowest levels since Bretton Woods, in order to stimulate the U.S. economy. Combined with federal policy to encourage home ownership, low interest rates sparked a boom in real estate and financial markets due to the fact that banks were able to issue mortgage loans to millions of customers that normally would not have qualified for them. The increase in loans to customers with high credit risk, known as *subprime lending* or in the context of the housing market, *subprime mortgage*, greatly increased demand for new housing, pushing home prices to even higher levels. When the Federal Reserve began to raise interest rates to control inflation in 2005, demand for housing declined, causing home prices to fall. As a result of the higher interest rates, most subprime borrowers, the great majority of whom held adjustable-rate mortgages, could no longer afford their loan payments. Due to continuing fall in home prices, both prime and subprime borrowers found themselves in a situation, in which they owed more on their mortgage loans than the worth of their homes.

The collapse of the subprime mortgage market led to serious trouble in the banking sector, causing solvency and liquidity problems for financial institutions as well as an interbank credit freeze, which impaired the ability of any bank to extend credit even to financially healthy customers, including businesses. As a result, investment, output and demand declined dramatically while unemployment, wealth losses and bankruptcies increased significantly. According to the 2011 report by the Financial Crisis Inquiry Commission, regulatory failures by the U.S. government and the Federal Reserve as well as the *shadow banking system* constituted the other significant causes of the Great Recession.

Monetary policy and fiscal policy coordination turned out to be critical for the aftermath of the Great Recession. Central banks around the world have implemented both conventional and unconventional monetary policies in order to mitigate the negative effects of the global financial crisis on macroeconomic and financial stability. In addition to the conventional monetary policy of adjusting the policy interest rate according to the circumstances, unconventional monetary policy measures such as *forward guidance*, *asset purchases*, *term funding facilities* and *adjustments to market operations* have been employed by central banks in both advanced and emerging economies. Governments all across the globe have taken active parts in the recovery process through several different mechanisms and due to many significant developments related to the public sector over the last few decades. Bailouts, social benefits and transfers, support programs and recovery packages are some of the mechanisms through which governments tried to reduce the severe impact of the global financial crisis on the economies. The fact that government budgets have become a much larger share of the economy, partly thanks to the rise of the modern social safety net, constitutes one of the developments related to the public sector that enabled active participation and effective reaction by governments in the recovery period.

Evaluating the consequences of the monetary policies carried out in the global economy during and after the Great Recession helps interpreting the current situation in international financial markets and plays a key role in designing effective monetary policy in turbulent times. Through presenting a comprehensive investigation of monetary policies conducted during that critical period of time, this study contributes significantly to the understanding of optimal monetary policy in response to financial crises.

MONETARY POLICIES IN ADVANCED ECONOMIES

Central banks in advanced economies pursued expansionary monetary policies using both conventional and unconventional measures in combatting the Great Recession, just like the rest of the world. There were similarities as well as differences among advanced countries with respect to the monetary policies followed during this turbulent period in the world economy. In the U.S., where it all started, the Federal Reserve initially employed conventional monetary policy actions by reducing the federal funds rate from 5.25% in September 2007 to a range of 0-0.25% in December 2008. With the federal funds rate at its effective lower bound by December 2008, the Federal Reserve began to pursue unconventional policy actions including *forward guidance*, *credit easing programs*, *large scale asset purchase (LSAP) programs* known as *quantitative easing (QE)*.² Due to the slow and weak recovery, the Federal Reserve continued to make changes to its monetary policy strategy as well as to its communication policies while implementing additional LSAP programs (commonly called QE2 and QE3).³

In Europe, both the European Central Bank (ECB, henceforth) and the national central banks employed expansionary monetary policy tools in order to reduce the severe impact of the global financial crisis on the economies. In 2008, a large stimulus package called the European Economic Recovery Plan was launched by the EU. The ECB took measures to support banking sector liquidity and accommodate the funding needs of banks. More precisely, between October 2008 and May 2009, The ECB reduced the interest rate on its main refinancing operations by 325 basis points to 1%. The unconventional monetary policy measures by the ECB were aimed at promoting the effective transmission of its standard policy; namely, interest rate adjustments, rather than providing additional monetary stimulus to the economy.⁴ The ECB's monetary policy response in the form of making a relatively limited amount of outright asset purchases while lending to a large number of banks against collateral was in contrast to the monetary policies of other influential central banks including the Bank of England and the Federal Reserve. The Eurosystem implemented a number of unconventional monetary policy measures including *enhanced credit support* and the *Securities Markets Program*, in addition to reducing interest rates to levels not seen in the euro area countries in recent decades. In Germany, the Bundesbank contributed significantly to the implementation of Eurosystem monetary policy through managing accounts for German credit institutions, settling monetary policy refinancing operations with monetary policy counterparties, checking and managing the securities provided for these operations and purchasing securities as part of monetary policy asset purchase programs.

In the U.K., which was also affected significantly by the Great Recession, the Bank of England implemented expansionary monetary policies including the reduction of the policy interest rate from 5.5% to 1% and the use of quantitative easing in order to stabilize the financial system and encourage economic growth.⁵ In addition, the Financial Services Act of 2012 was launched in the U.K. to reform the financial sector and increase transparency as well as regulatory

² Chen et al. (2016) study the impact of U.S. quantitative easing on both the emerging and the advanced economies, estimating a global vector error-correction model.

³ For a detailed discussion of the unconventional monetary policies implemented in the U.S. during the Great Recession, see, among others, Kuttner (2018).

⁴ Cour-Thimann and Winkler (2012) review the ECB's unconventional monetary policy measures in response to both the global financial crisis and the sovereign debt crisis and interpret these measures from a flow-of-funds perspective.

⁵ Kapetanios et al. (2012) analyze the macroeconomic impact of the first round of quantitative easing implemented by the Bank of England.

oversight in the financial industry. The Funding for Lending Scheme was also introduced in 2012 with the purpose of raising the availability of credit to businesses and households by providing banks with funding at low rates on the condition that they lend to these sectors.

The Bank of Japan implemented various monetary policy measures including reductions in the policy interest rate, steps to facilitate corporate financing and measures to ensure stability in financial markets. Outright purchases of corporate financing instruments, purchases of stocks held by banks, subordinated loans to banks, expansion of the securities lending facility, introduction of the complementary deposit facility, acceptance of bonds issued by the governments of the U.S., the U.K., Germany and France as eligible collateral and suspension of selling stocks held by the Bank of Japan were among the many monetary policy measures performed in Japan.⁶

Finally, the Bank of Canada responded to the challenges facing the Canadian financial system from the start of the global credit crisis in August of 2007. In order to promote liquidity in the markets and to alleviate funding pressures, the Bank of Canada initiated term lending facilities in late 2007 and lowered the target interest rate rapidly over the course of 2008 and early 2009 to its lowest possible level. In addition, the Bank of Canada established an operating framework for the execution of monetary policy at the effective lower bound for the overnight rate and provided exceptional guidance on the future path of rates through its conditional commitment. The Bank of Canada also outlined a framework for quantitative and credit easing measures to lower longer-term borrowing rates to help ensure that it continued to hit its inflation target.⁷

MONETARY POLICIES IN EMERGING ECONOMIES

Monetary authorities in emerging countries conducted expansionary monetary policies, similar to those in advanced countries, in order to mitigate the severe effects of the Great Recession. In Brazil, several unconventional monetary policy measures were taken in addition to conventional monetary policy tools. More specifically, the Central Bank of Brazil increased liquidity in the economy and employed measures including reductions in the compulsory deposits required from banks as well as an international export finance credit line established with funds available from Brazil's international reserves in order to reactivate the credit market. As part of additional measures, public banks operated on the credit market in order to neutralize the negative impact of the private financial system on market liquidity. Moreover, lines of external credit are provided and operated by the Central Bank of Brazil and the Federal Reserve to meet the financing needs of the private export sector. Furthermore, occasional interventions in the exchange rate market took place in order to prevent any devaluation of the Brazilian real from generating a passthrough effect and thus jeopardizing the inflation targets.

In Turkey, the Central Bank of the Republic of Turkey (CBRT, henceforth) initially pursued conventional monetary policies, similar to the majority of the central banks around the globe. The CBRT reduced the policy interest rate by 1025 basis points over the November 2008 – November 2009 period. At the end of 2010, a new policy strategy was designed and launched by the CBRT. The main objective of achieving and maintaining price stability as well as the supporting objective of safeguarding financial stability were both preserved by the new policy

⁶ Dell'Ariccia et al. (2018) provide a comprehensive analysis of the unconventional monetary policies in the Euro Area, the U.K. and Japan.

⁷ Joyce et al. (2012) provide an assessment of the influence of quantitative easing and other unconventional monetary policies pursued by central banks during the global financial crisis.

strategy, which involved unconventional policy tools such as interest rate corridor and reserve requirement ratios in addition to policy rate adjustments in order to handle financial imbalances. The primary goal was to channel capital inflows towards long-term investments and to prevent the over-appreciation of the Turkish lira while the secondary goal was to have a more controlled growth in domestic loans and in domestic demand.

The Bank of Mexico adopted several unconventional monetary policy measures in order to mitigate the severe effects of the global financial crisis.⁸ More precisely, the Bank of Mexico started to inject U.S. dollars into the foreign exchange market through two types of auctions in October 2008. Through extraordinary auctions, a mechanism used in order to sell the U.S. currency directly to the market, \$11 billion worth of liquidity was provided to the market. The second type of auctions consisted of three daily auctions for a cumulative amount of \$400 million, starting on October, the 9th, in order to decrease exchange rate volatility. In addition, a foreign currency swap line was agreed with the Federal Reserve on October, the 29th, for up to \$30 billion, in order to supplement foreign reserves. The Bank of Mexico allocated \$28 billion to the foreign exchange market from October 2008 to February 2009.

In India, a number of conventional and unconventional monetary policy measures were taken by the Reserve Bank of India (RBI, henceforth) in order to augment liquidity of both domestic currency and foreign exchange. During the process of liquidity injection, the counter-parties involved were banks; even liquidity measures for mutual funds and housing finance companies were largely channeled through the banks. Despite large liquidity injection, the balance sheet of the RBI did not exhibit unusual increase, unlike global trend, because of release of earlier sterilized liquidity. By synchronizing the liquidity management operations with those of exchange rate management and non-disruptive internal debt management operations, the RBI ensured that appropriate liquidity was maintained in the system, consistent with the objective of price and financial stability.

Last but not least, the People's Bank of China (PBC, henceforth) switched to expansionary monetary policies in November 2008 in order to cope with the severe impact of the Great Recession.⁹ Through reducing interest rates to historically low levels, decreasing bank reserve requirement ratios and removing quota control on lending by commercial banks, a huge amount of liquidity was injected by the People's Bank of China into the banking system. More specifically, the PBC initially decreased the benchmark lending and deposit rates of financial institutions on five occasions. Reducing the benchmark interest rate was effective in stimulating credit demand and resulted in a rapid rebound of credit and money, which contributed to stronger market confidence and higher domestic demand. In 2008, the PBC lowered the renminbi reserve requirement ratio of financial institutions four times in a row, increasing the liquidity in the market. In addition, the PBC effectively handled the pace and the intensity of open market operations in order to stabilize market expectations. Moreover, the PBC launched the Term Auction Facility, through which short-term pledged loans with a maturity of no more than three months were issued to qualified domestic financial institutions including foreign-funded banks incorporated in China. Furthermore, the PBC provided rediscount operations and central bank lending to financial institutions facing liquidity difficulties.

⁸ Sidaoui et al. (2010) discuss the policy responses to the Great Recession in Mexico.

⁹ For studies on the policy responses of China to the global financial crisis, see, among others, Yongding (2009) and Zhang et al. (2009).

CONCLUSION

The Great Recession, the severe effects of which were aimed to be mitigated by monetary and fiscal authorities all across the world, caused dramatic instability in international financial markets. While governments in most countries launched stimulus programs and recovery packages in order to revive economic activity, both conventional and unconventional monetary policies were pursued by central banks in order to combat the global financial crisis. The conventional monetary policy of adjusting the policy interest rate according to the circumstances is implemented together with unconventional monetary policy measures such as forward guidance, asset purchases, term funding facilities and adjustments to market operations by the majority of central banks around the globe. Due to the slow and weak recovery, additional policy measures as well as extensions of existing stimulus plans and support programs were introduced by fiscal and monetary authorities. Evaluating the consequences of the monetary policies carried out in the global economy during and after the Great Recession helps interpreting the current situation in international financial markets and plays a key role in designing effective monetary policy in turbulent times. Through presenting a comprehensive investigation of the monetary policies conducted during that critical period of time, this study contributes significantly to the understanding of optimal monetary policy in response to financial crises.

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**DYNAMIC APPEARANCE OF PERSONAL INCOME TAX PROGRESSIVITY AND
POST-IMPLICATIONS TOPICAL ALTERATIONS IN GLOBAL EXPECTATIONS****Ahmet Niyazi ÖZKER**

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ABSTRACT

This study aims to reveal to what extent global dynamics, especially regarding personal income tax, are evaluated within the scope of current optimal taxation standards and on which priority issues the present result effects of this global change phenomenon are open to discussion. This purpose also brings to the agenda how and at what stage the structure of personal income tax, which can be expressed with increasing rates saying different values, is evaluated and at what stage with different optimal taxation standards. In recent years, the personal income tax progressively has not reached a different standard at the global level, which also means that it creates a narrowing effect in terms of tax base and tax values. The steady state of progressive personal income tax at the global level, especially in the 1980s and 1990s, shows a significant progressive decline after 1990 and especially in the 2000s, resulting in significant deviations in personal income tax due to the effects of social policies. Therefore, it is required to understand in which expectations regarding the results of progressive personal income tax applications are shaped by the countries in the scope of fiscal resources needed. In this regard, it is observed that in the last 30 years, especially in OECD countries, the issue of stability in the measurement of tax capacity has frequently come to the fore. A downward trend in progressive income tax practices has revealed a structure consistent with decreased income tax rates worldwide. The perception of this phenomenon as an essential fiscal deviation issue in developing countries and emerging economies has made it inevitable for these countries to implement a progressively increasing personal income tax at higher rates in a structure where the increase of public financial resources is targeted.

KEYWORDS: Fiscal Dynamics Global Expectations, OECD, Tax Applications, Tax Progressivity.

JEL Codes: H21, H24, H31.

INTRODUCTION

Progressiveness regarding personal income tax can be considered a tax justice phenomenon in which taxation principles, especially related to income level, come to the fore. This phenomenon also reveals a structure that ensures a more equitable distribution of the tax base and that the tax pyramid is based on higher taxes, especially for people with high income levels. The dynamics in the taxation of personal income are aimed at creating a structure that is separated from flat-rate taxation and where this separation ensures tax justice more clearly and an effect mechanism that increases the tax emphasis on the tax base in response to increasing income. This purpose is shaped by tax bases corresponding to different tax values. These application determinations must express a progressive ratio that creates a certain marginal tax rate balance with proportional tax increases for each monetary value earned. In other words,

the priority of a higher increase in personal tax rates in response to increased income makes the existence of a higher marginal tax effect in response to increased income inevitable. This phenomenon also creates a global impact level, where fiscal expectations, which are shaped as a structural value change in which tax justice can be achieved, make different impact values, especially regarding some expectations at the global level, through increasing marginal tax rates (Beer et al, 2023). It is observed that tax values, especially in developing countries and countries representing emerging markets, constitute a specific standard global objectives procedure that can affect global macroeconomic balances on households. This procedure aims at a tax on personal income tax, with a structure that imposes the same burdens on people with the same financial conditions in income increases. Tax higher income increases are subject to higher rate tax increases beyond the proportionally equal tax increases and increases in the tax pyramid make a higher fiscal impact increase position inevitable (Kleinbard, 2005).

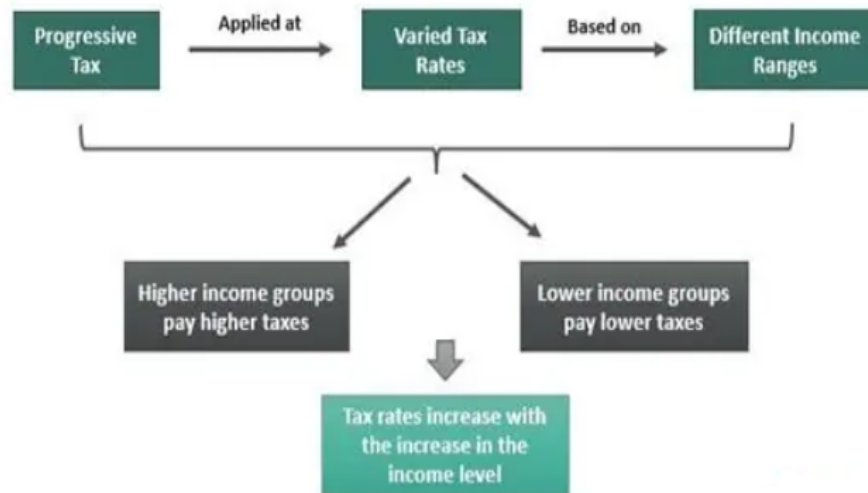
In this regard, significant differences between countries regarding the infrastructure in tax revenues have also triggered a global fiscal rupture process that differentiates the current structure and institutional expectations of the disagreements regarding progressiveness at the worldwide level, where social-economic targets differ. In this context, different perception values that may cause fiscal polarization at the global level have brought to the agenda a process in which the global expectations of countries adopting different fiscal and political approaches have turned into an environment of contradiction, confusing fiscal targets in which tax progressiveness has turned into an even more contradictory structure (Devereux & Griffith, 2003). The process in which the effectiveness of progressive proportionality is primarily discussed to ensure the effective collection of tax revenues at the global level has been brought to the agenda. Nowadays, the structure discussed in the priority of a progressive personal income tax makes sense with its effects on the economic behaviour of individuals. This phenomenon is because each country has its uniqueness as different fiscal institutional developing levels, primarily as related to progressive personal income tax (Heshmati et al, 2014). However, it also points out that some discounts and exemptions at the worldwide level create a vulnerability that makes differences between countries and some crucial differences in progressive tax practices, weakening the global financial integration process. Along with the tax brackets representing income levels, the process in which income brackets emerge at various income intervals for individuals is also included in the process as a phenomenon that directly affects the progressive tax brackets related to the development levels of the countries (Mertens & Ravn 2013).

STRUCTURAL DYNAMICS AND IMPACT PROCESS OF PROGRESSIVE PERSONAL INCOME TAX

To understand the progressiveness of personal income tax at the global level, it is meaningful to reveal the dynamics of the progressiveness phenomenon structurally. In other words, establishing the institutional infrastructure to ensure international tax compliance and the joint personal income tax harmonization targeted with the OECD financial affairs committee reveals the inevitability of institutional compliance in the global harmonization process, where income level differences frequently come to the fore (OECD, 2012). However, the critical contradiction of possible personal income tax applications is the requirements arising from the differences in determining progressive rates. Difficulties in tax auditing and determining possible exemption limits are evaluated with priorities emerging from the subjective structure of the countries.

The issue is discussed mainly based on tax brackets and tax rates for progressive taxes, but it also brings up some severe global problems regarding tax bases and income definitions. Differences in tax brackets and tax rates at the international level have become essential factors

differentiating the global impact values on the progressive approach (Norregaard, 1990). In this context, rates in low-income and middle-level income brackets in other underdeveloped countries and different approaches to income brackets create a differentiation effect as an essential progressive tax dynamic, meaning that different exemption positions are subject to different tax rates. Figure 1 below presents the structural dynamics of the global adoption of a progressive personal income tax and its overall impact distribution:



Source: Ashish Kumar Srivastav & Dheeraj Vaidya (2022). *Progressive Tax*, <https://www.wallstreetmojo.com/progressive-tax/> (Accessed December, 12.2023).

Figure 1. Income Level Distributions and Dynamics of Progressive Personal Income Tax

Figure 1 above also presents differences in various factors regarding progressive taxation and the approaches of tax institutions as general practices. As seen in Figure 1, the structure in which it is aimed to ensure that higher income groups pay higher taxes and lower income groups pay lower taxes provides integrity of purpose, especially by regulating existing tax rates according to different income groups and gaining efficiency. Evaluating them rationally in practices and structural locations, as a fiscal aim, can be revealed by directing them to other income groups. This structural theory can undoubtedly gain meaning with a structure in which tax audit and public revenue expectations are placed in a correct rational slicing. The structure, in which social and political factors are also influential, turns into a balanced situation in which public opinions, political leadership and global-level progressive income tax expectations differ in shaping tax reforms. The frequently changing fragile structure of democratic processes and political infrastructure in developing countries emerges as a necessity in shaping tax policies, which puts progressive taxes into a severe change process at the global level. In this context, increases in tax rates must turn into an income-tax balance position with a *Marginal Tax Self-Sacrifice* that can be expressed as an equivalent marginal cost (Şener, 1997).

It is also observed that progressive personal income tax has an essential place in some issues related to private property, especially regarding practices. In other words, the Investment Income Tax, which may be especially applicable in practice, creates a progressive effect as a tax applied to personal income, especially the share of income obtained from people's savings and investments, as a taxed progressive income tax. This effect may exist at different rates, especially for existing practising forms. On the other hand, it has gained significant effectiveness in some issues related to this practice by regulating tax rates that create different

impact values, and it constitutes a platform where the facts regarding the creation of positive effects on the regulation of income distribution among individuals. It means taxing several assets that can be obtained from people's investments, especially those who have different investment amounts over again, a significant income flexibility in taxing them. This flexible structure of substantial income tax flexibility in practice also means that the applications that can be evaluated within the framework of the tax premium pyramid also expand the tax base of the tax pyramid at a higher rate.

This situation also creates at the same time, the trend of higher tax rates at the top of the tax pyramid. On the other hand, the personal income tax, which may be in question in individual tax applications, is an income obtained from being collected on the assets inherited from the heirs. Besides, it is a progressive tax rate as Estate Tax that is used as a high tax rate on inherited income (Farhi & Werning, 2002). It represents a tax that can be collected at a high level on specific amounts, creating a socio-economic impact. This progressive effect can also become an increased rate expressed through Tax Credits, especially in existing practices. In this context, progressive personal income tax presents a situation where a tax credit is subject to a different tax practice that tries to reward specific individuals for their tax contributions. But it can be expressed as particular amounts deducted from taxing individuals' income, not from a gross income earned. In other words, the increasing proportionality of Tax Credits, especially in applications such as elderly and disabled individuals or retirement savings credits, reveals that it creates a positive, progressive income effect with a negative effect, a reverse application aimed at increasing social welfare (Sleet & Yeltekin, 2006).

DIFFERENCES IN GLOBAL EXPECTATIONS ON PERSONAL INCOME TAX AND CURRENT TAX APPLICATIONS

Talking about a structural issue where some expectations come to the fore regarding the expectations of personal income tax at the global level provides an essential framework for understanding a current personal progressive income tax. Today, a personal progressive income tax application can also be expressed in a position that creates some significant impact values compared to other proportional or flat tax rates and creates different structural effects on the economy and sectors, as well as various effects on households. In other words, what an increasing income tax collected from individuals, directly or indirectly, means in terms of the possible added value of their contribution to economic growth has constituted an essential approach regarding economic growth plans.

This approach also means establishing a balance that meets common ground with other economic growth-oriented phenomena, significantly reducing income inequality and increasing government revenues (Kapicka, 2006). On the other hand, the priority of this approach has often brought to the fore a current negative structure in which global positive expectations regarding financial practices have turned into a more complex practice trend among countries and international economic polarization has become more differentiated at progressively increasing rates (Bastagli et al, 2012). Table 1 below shows the differences in the tax application process as a whole regarding the objectives of a progressive income tax and global expectations:

**Table 1. Global Differences in Personal Progressive Income Taxes
as Topical Expectations**

FACTOR	PROPORTIONAL TAXES	PROGRESSIVE TAXES	REGRESSIVE TAXES
Impact on Economy	May Discourage Economic Growth and Job Creation	Can Help Reduce Income Inequality and Increase Government Revenue	May Contribute to Income Inequality, but Can Be Effective in Raising Government Revenue
Impact on Businesses	Simple to Administer, Providing Consistency for Small Businesses	More Challenging to Manage Due to Different Tax Rates	May Have a Disproportionate Impact on Businesses That Rely on Low-Income Workers or Produce Basic Goods and Services
Impact on Households	Places a Similar Burden on All Households	Places a Greater Burden on High-Income Households	Places a Greater Burden on Low-Income Households, Which Can Impact Disposable Income and Overall Standard of Living
Societal Implications	Can Be Criticized for Being Regressive	Can Help Reduce Income Inequality and Provide Support for Low-Income Households	May Contribute to Income Inequality, but Can Be Effective in Raising Government Revenue

Source: True Tamplin (2023). Overview of Proportional, Progressive, and Regressive Taxes, <https://www.financestrategists.com/tax/proportional-vs-progressive-vs-regressive-taxes/> (Accessed December, 14.2023).

As seen in Table 1 above, the targets expected from a progressive personal tax application at the global level form a chain of expectations on four main international structural implementation activity areas. Certainly, it is important to emphasize that the progressive rate of personal tax practices at the global level significantly impacts economic growth and the production and manufacturing sectors. These practices also impact progressive income tax differently, especially the effective values in sectoral growth. Progressive tax practices also aim to ensure tax efficiency with a structural situation in which households with higher incomes can be subject to a lower tax burden.

These expectations regarding taxes at the global level have also turned into a worldwide situation where the recent increased tax burden and the increasing tax burden regarding personal income tax on income tax have increased even more. It has also become a global structure that, in meeting the countries' growing need for financial resources, fixed-income earners are negatively affected by a higher tax burden, especially from increasing tax rates. However, when we look at social practices, it is understood that progressive tax increase rates related to global tax practices, as the practical values of a structure where income inequality continues, do not yield the desired results (Thompson & Smeeding, 2013). It is also observed that, with some values, it has taken place in the process as an income distribution disorder, where income distribution has further deteriorated, and the income gap increases even more, especially in developed countries.

Progressive income taxes have turned into a global phenomenon that has transformed into a structure where higher income limits are supported positively, together with the existence of a structure where higher marginal tax burdens on households are particularly prevalent. In this context, even if there are real losses in progressive tax practices with increasing inflation rates in countries, the inevitability of a structure in which the values of tax burden increase at a high rate still negatively affects households at the global level. In this context, the application of a progressive tax burden has not only increased the tax burden based on a personal income

distribution, which can be addressed especially based on households, regarding progressive personal income taxes (Peñalosa & Turnovsky. 2011).

However, compared to other tax practices, this situation turns into a different structure than progressive income taxes. The approach to expressing simple proportional tax values has also questioned the approaches that may lead to a discouraging structure and sectoral shrinkage in achieving macro balances on economic growth job creation and sectoral development. But also weakened the practices regarding the effective management of tax practices to gain implementation efficiency in sectors have not been maintained via progressive income tax applications, which is desired on the global ground.

GLOBAL AVERAGE PROGRESSIVE CAPACITY AND THE MARGINALITY OF PERSONAL INCOME TAX RATES

It can be said that the most critical targets regarding the progressive personal income tax are technological change and practices related to the change in the workforce structure. Their approach to correcting the income distribution of the labour tax as a personal income tax offers a progressive goal: closing the gap between high-income and low-income rates and turning it into marginal cost taxation (Macnamara et al, 2023). On the other hand, when viewed from a global perspective, this aim can also be considered an impact phenomenon directly affecting international labour mobility. It reveals that the structure of a progressive income tax with increasing rates at the global level, which can be expressed with different values, has been subject to progressive and meaningful proportional variations in the last thirty years.

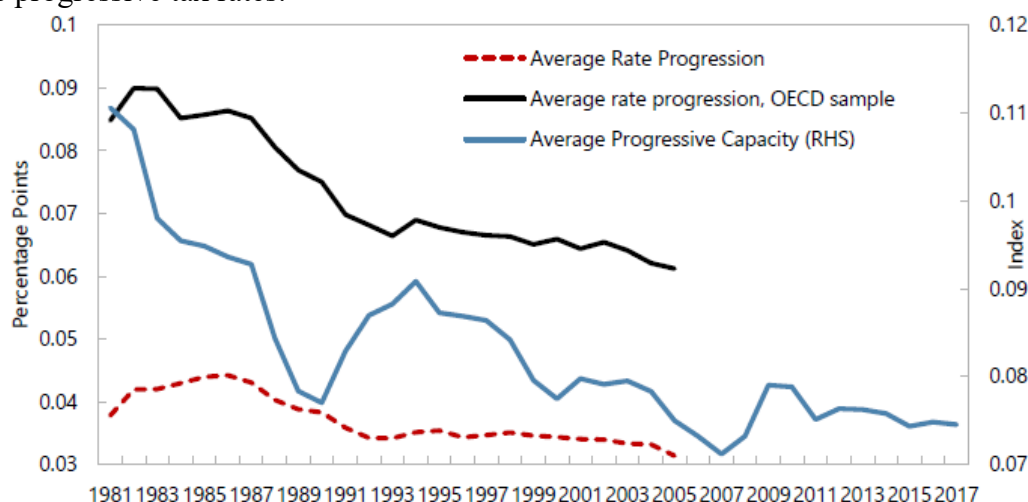
Outlook of The Global Average Progressive Income Tax Proportional and Average Progressive Capacity

Undoubtedly, here we see the impact of social policies, especially the progressive structure of the personal income tax, social policies and welfare targeting a trend of lower taxation and expanding the tax base with lower tax rates and a lower tax increase rate. Indeed, increasing the tax at lower rates can also be expressed as a grassroots dissemination project of taxes as related to worldwide projects. These increases at the global level, especially the average progressive tax capacity effect, have found a place in the process with a trend structure in the same direction along with the average values of progressive tax increase rates, and progressive variability is expressed with this structure (Ram, 2006). Especially from the IMF perspective, research on OECD countries shows that income tax has a significant negative progressive bias effect.

Although this negative rate trend progressiveness creates a significant deviation in the public financing resources expected from taxes, it has recently made it inevitable to expand the tax base or increase the efficiency of the implementation process of the tax spectrum with various taxes. In other words, the deviation increasing average, as decreasing rates, means that new taxes have been introduced at the global level since the same period, with the effect of decreasing in the years after 1980, and that new tax sources are related to new taxation (Kargbo & Egwaikhide, 2012). Besides, this phenomenon has found a place that has revealed beyond what was expected in terms of the new taxes and their practising in the process.

In this context, it also reveals that this decreasing effect of the average tax progressive restoration directly affects the progressive annual tax capacity globally and even entered a downward trend of approximately 7% after the 1990s. In addition, it is seen that this deviation, as index values, is equally compatible with the average global tax deviations, with the percentage deviation values having a significant deviation effect as index values. However, especially when evaluating personal income tax rates based on corporate tax and all individual income taxes in the general sense of income taxes, it is meaningful that the income taxes

collected under corporate income tax, especially on capital income, remain low. In brief, the fact that the progress regarding the average tax progressively increases is low at the entire global level is a situation where most of the countries on the global scale are more affected by the emphasis that they are developing and underdeveloped countries and, therefore, it has resulted in the proportional change values are low. Chart 1 below shows the recent percentage variability and deviations of global tax capacity rates, which are also directly related to international average progressive tax rates:



Source: Claudia Gerber, Alexander Klemm, Li Liu, Victor Mylonas (2018). *Personal Income Tax Progressivity: Trends and Implications*, IMF Working Paper WP/18/246, November 2018, Washington D.C.: International Monetary Fund (IMF) Fiscal Affairs Department, 2018, p.11.

Graphic 1. Global Variability of Tax Progressivity and Average Progressive Capacity

As observed in Chart 1 above, although the average tax rate increase progress trend has experienced a minor periodic deviation, this course of the average rate progress capacity at the global level is not reflected much in the OECD countries. Besides, OECD countries have significantly lower declines from the progressive rate advances with a more significant impact. The situation where there is an increasing tax rate when these deviations are in question reveals that the progressive increasing rate capacity causes significant deviations on the entire world surface. This phenomenon suggests that variations in global ad valorem tax advances are reflected in a higher and more negative average progressive capacity, creating a more significant negative correlation.

This negative correlation is a global position in which the average progressive rate capacity at the worldwide level decreases further, being higher in countries representing emerging economies, revealing a periodic deviation trend. This approach aims to ensure capital flow to these countries by reducing the increasing capacity of the need for foreign capital in emerging economies, especially in developing and underdeveloped countries (IMF, 2003). It can be said that open requirements for external capital regarding capital transfer, low progressive capital taxes, cheap labour, and other production factor inputs directly reduce the progressive structure and create a low tax capacity.

However, a structure in which GDP increases, especially in emerging economies, has absolute deviations at the global level, which has caused more significant deviations in the actual value of the average personal progressive tax capacity, especially at the entire international level. This

equivalent deviation in average tax progression, especially in OECD countries, can be explained by deviations in GDP in emerging economies or recent economic growth decline trends at the global level (OECD, 2023). When we consider the issue more precisely on an income tax basis, beyond the global progressive structure we examined in Chart 1 before, in understanding the position of the progressive income tax, we see that some decreases in personal and income tax rates have a place. In other words, there has been a situation in which the phenomenon considered personal income tax has experienced a proportional decrease as an income tax phenomenon when considered in general.

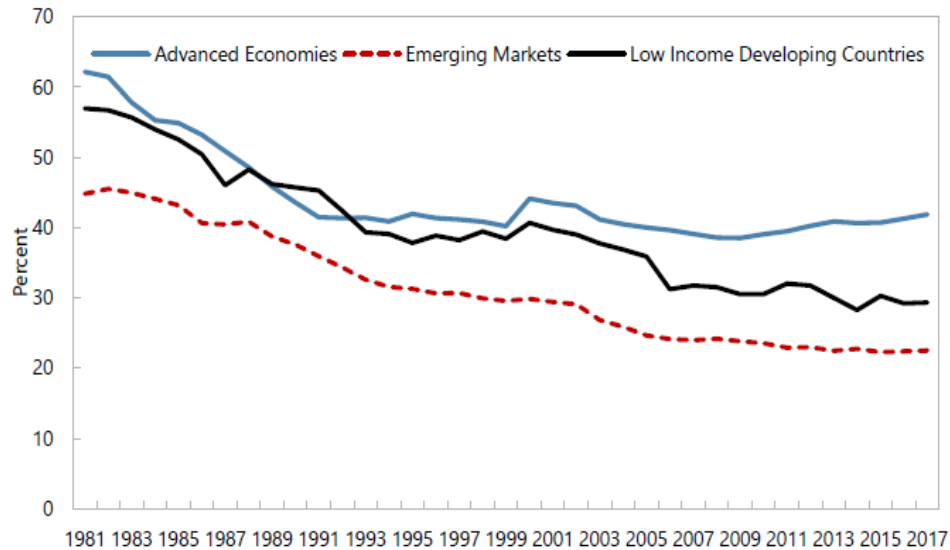
Although this situation also parallels a specific downward trend between issues related to developed economies and emerging markets, low-income countries are pursuing higher income tax rates than emerging economies (Godar et al, 2014). Thus, all kinds of structurally different economic factors that can be considered regarding social imbalances reveal the certainty of the need for a structure in which policymakers correctly perceive and analyse them. This structure can be solved, especially in the social sense, by which priority-primary public services come to the fore, income distribution and inequality of opportunity can be eliminated, and the perception of a democratic infrastructure free from conflicts of interest comes to the fore.

Proportional Change of Income Tax at the Global Level Related to the Level of Development

The issue that should be emphasized here is that deviations in the progressive tax structure, especially in underdeveloped and low-income countries, may create a possible deviation in the target economic growth trends. In other words, this phenomenon, which can be considered a slowdown in economic growth, also means a structure far from having the potential to spread the consumer base throughout society within the scope of broader income distribution. It should be emphasized that this situation also negatively affects personal income taxes at the global level, with its lower capital incentive structure.

Especially in emerging economies, evaluating the proportional difference between the taxes collected on labour as personal income tax and the income tax collected as a corporate tax on capital income, outside the Tax Separation principle, has turned into a negative tax discrimination effect globally (Feital, 2021). The incomes to be obtained as personal capital incomes have different tax rates, especially at the individual level, and higher deviations in incomes, such as emotional labour and wage incomes. This structural formation shows a more negative outlook. This situation reveals that tax advantages beyond expectations do not affect developing countries positively. This shows an issue directly proportional to low-income countries' increasing public financing needs.

This phenomenon means that this transformation has also led to the emergence of a process in which the tax rates in developed economies and low-income countries have followed a very similar trend in recent periods. Namely, because of the difference in per capita national income, personal income tax rates in low-income countries have been more negatively affected globally. Chart 2 below shows the recent global position of progressiveness, with individual income tax rates remaining relatively high in developing countries where the highest rates are averaged:



Source: Claudia Gerber, Alexander Klemm, Li Liu, Victor Mylonas (2018). *Personal Income Tax Progressivity: Trends and Implications*, IMF Working Paper WP/18/246, November 2018, Washington D.C.: International Monetary Fund (IMF) Fiscal Affairs Department, 2018, p.11.

Graphic 2. Top Personal Income Tax Rates to the Development Level (As Average Percentage)

As seen in Chart 2 above, the deviations in personal income tax rates, especially in developing economies at the global level, reveal a structure related to the international location of the reductions in tax brackets related to progressive practice. In other words, the proportional decreases in the countries representing the emerging markets are more significant when considered globally. It reveals that it is subject to practices aimed at expanding the tax base, which shows that it is more positively affected by the progressive structure within the decreasing trend. However, despite everything, the structure in which these practices are handled, primarily based on low-income countries, acts at a proportional level that can be considered equivalent to developed economies.

The fact that adult increases in tax rates in countries representing emerging markets has become a tax incentive for the foreign market that also supports corporate exports reveals a structure that is impossible to follow in low-income countries (Heckemeyer, 2022). However, low-income developing countries, at the same time, with their structures that are far from a developed industrial structure or cannot reach the desired level, mainly highlight the increasing tax rates in ensuring the balance of increasing commercial current account deficits. Thus, further increasing the need for public financing regarding personal income tax rates and these countries took refuge in the tax practices they concentrated on. What kind of proportional change tax rates have undergone in the recent environment is significant with the position of tax capacity at the global level.

In addition to expressing this approach, especially in percentage change points, it is also possible to say it in terms of values accepted as index values. Global variability is essential to show that tax progressiveness affects the average tax capacity and the significant position of the average tax capacity, especially within structures such as OECD countries. Average proportional increases entered a significant downward trend in the world, especially in the years after 1980, and this trend took place in the following years, creating a low effect that could

directly affect the progressive tax capacity. On the other hand, this situation can also be explained by the decrease in personal income taxes in emerging economies and the increasing income level of emerging economies bringing social welfare policies to the fore with more positive practices in person-based structures (Ruf & Weichenrieder, 2012). The same situation in emerging and developed economies also reveals a socioeconomic divide that has a decreasing effect due to the coming to the fore of social welfare policies and the policies where Neo-Liberal practices come to the fore.

This distinction also did not create the desired positive tax base effect on low-income countries, which could be expressed with different values. The existence of a structure in which tax reforms and broader dissemination projects and tax reforms are not very effective, especially in the case of personal income tax, reveals this structure in low-income developing countries with deviations in the progressive application structure of individual income tax (Spengel et al, 2018). However, the negative decline in more stable tax rates in developed economies reveals that taxation options regarding personal income tax have entered a new increasing trend with the increases in personal income tax in the years after 2020.

An important reason for this situation in developed countries can be explained by a devaluation cost element that can be expressed as the actual losses in the monetary policies implemented at the global level and the effect of global inflation. It is also necessary to emphasize the controversial visibility of monitoring the positive impact of this cost element, especially in emerging markets and underdeveloped, low-income developing countries. This decreased social mobility is an essential source of social unrest between social classes, primarily based on income inequality. It is possible to observe the recent social tensions, where the negativities related to this phenomenon frequently continue in developed countries today and lead to social discontent and anger.

Moreover, the existence of inequality of opportunity that may reduce possible social mobility, serious cost elements that may be subject to deviations in education, health services and other public services, and its progressively negative structure have created. This expected fiscal trend as a tax practice is a trend of seeking a budgetary policy in personal income tax practices (Gale & Samwick, 2014). It should not be ignored that social welfare policies and income distribution deviations directly related to growing economic trends regarding the financial growth targets of countries may negatively affect sectors, especially with an *Accelerating Tax Effect* (Doernberg & McChesney, 1987). However, it should be remembered that social unrest and deviations in income distribution cause social costs that may arise among individuals, such as severe stress and physical problems that may arise from economic uncertainty. In countries that address all economic growth principles, increasing qualification values for human capital at the global level is possible by applying a rational income tax on these values.

DISCUSSION

The introduction of progressive tax practice at the global level has become an important priority, especially in rationalizing and achieving rational income distribution. At the worldwide level, especially the shift in the search for new taxes to different consumption taxes as indirect tax authorities have positively affected reducing the rates on income tax, which is a direct tax and reducing the tax burden. However, a progressive structure in improving income distribution should not become a tax burden phenomenon that arises with excessive tax rates in a structure that can reduce economic incentives. Excessively high tax rates that can reduce financial incentives are an essential progressive tax drawback that can cause significant difficulties in efficiently using resources. In addition, tax deductions and social benefits gain meaning by correctly and rationally determining the exemptions and exceptions regarding the

tax rates in such policies and applying a rational tax appropriate to the relevant country to correct the income distribution. All kinds of tax reduction structures that may arise regarding tax reductions and social benefits must find a place in the process with tax reductions that can contribute to economic growth and a phenomenon that can increase the financial sustainability of social benefits and tax policies.

It is also a critical mistake to perceive the structures and practices that may emerge with low tax rates as progressive. Therefore, it should be emphasized that a flat-rate tax system or a fixed-rate tax increase does not represent an advanced structure. Therefore, the possibility that such a proportional tax application may cause individuals to be under a potentially more significant tax burden is always present in a tax pyramid perspective. This is why public and infrastructure services must be included in the process with a structure that can indirectly reduce income inequality due to their characteristics. In this respect, it can be said that one of the biggest reasons why indirect taxes are high in underdeveloped, low-income developing countries is the existence of socio-political and economic disabilities, which can be listed as other obstacles to the implementation of a progressive structure at the global level, and the increasing day by day global expectations for social and political services. In this regard, in addition to ensuring tax justice and preventing tax evasion or losses, the increasing impact of indirect taxes on taxpayers in ensuring inequality in income distribution is of great significance and has been a more meaningful place in developing countries with low national income levels.

CONCLUSION

The tax practices based on not being rational progressive proportionality may also create a different structural sectoral shrinkage effect. While small-income industrial units and business volumes are subject to a lower tax rate, sectoral units with higher income rates are subject to higher tax rates and can obtain a meaningful progressive tax incentive. In addition, the fact that large capital companies subject to progressive income tax pay higher tax rates has created a positive effect from the increasing proportionality towards developing the sectoral base for smaller businesses. However, that is the most crucial feature among current expectations has gained significant currency as the impact value of a progressive personal data income tax on the economy. However, it also points out that some discounts and exemptions at the worldwide level create a vulnerability that makes differences between countries and some crucial differences in progressive tax practices, weakening the global financial integration process. Along with the tax brackets representing income levels, the process in which income brackets emerge at various income intervals for individuals is also included in the process as a phenomenon that directly affects the progressive tax brackets related to the development levels of the countries.

This phenomenon has come to the fore, especially with the view that a flat-rate tax structure may, unfortunately, contribute to the distorting effect of income distribution. This approach expresses the certainty of personal income tax being subject to tax practices that can positively impact people's welfare. In addition, in terms of human capital, low-income segments directly benefit from health and education services resulting from equality of opportunity, and the added value they create in the labour-wage dilemma carries the contribution to economic growth to higher values as more positive. The existence of support and taxpayer participation in tax practices in terms of a broad tax base will increase the effectiveness of progressive tax practices, with the emergence of a significant tax implementation efficiency in the political trust environment that can be provided by personal income tax. It is an inevitable priority for developing countries that fiscal justice, including political trust, emerges as a basis that forms

the main strength of the tax structure, especially in preventing some financial trust and taxation evasion situations, such as tax evasion and losses.

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FINANCIAL PERFORMANCE COMPARISON OF PARTICIPATION BANKS VERSUS CONVENTIONAL BANKS DURING THE PANDEMIC PERIOD IN TURKEY BY DATA ENVELOPMENT ANALYSIS

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ABSTRACT

This study aims to investigate the performance differences between participation banking and conventional banking during the COVID-19 pandemic crisis. Participation banks and conventional banks differ in terms of their operations, especially in terms of their basic principles, and one of the most important differences is that participation banks have the legal authority to conduct business. It is important to understand how these differences interact with financial crises.

The Data Envelopment Analysis (DEA) is a powerful method to calculate the efficiency of a given number of decision-making units. In order for this method to be applied, decision-making units must be comparable. Therefore, in this study, data was collected from 30 conventional banks and 6 participation banks operating in Turkey in the 4-year period between 2019-2022.

In the DEA, variables such as total assets, equity, the number of employees and the number of branches in the non-consolidated year-end balance sheets of banks were used as inputs to observe how efficiently banks used these inputs and converted them into market share, while deposits, granted loans and the bank's net profit were used as outputs.

Finally, the two types of banks were separated, and when the 4-year average efficiency values were averaged, an efficiency average of 0.91 for conventional banks and 0.98 for participation banks was obtained. It is crucial for banks to operate efficiently and strengthen themselves to continue their operations during economic crises. This challenging pandemic period was examined using the DEA, and it was observed that participation banks were more efficient. Moreover, the consistent increase in the number of branches and personnel indicates that they emerged from the crisis strengthened.

KEYWORDS: Participation Banking, Conventional Banking, Efficiency Analysis, Crisis Periods, Financial Performance

ÖZET

Bu çalışma, COVID-19 pandemi krizi sırasında katılım bankacılığı ile konvansiyonel bankacılık arasındaki performans farklarını incelemeyi amaçlamaktadır. Katılım bankaları ve konvansiyonel bankalar, özellikle temel prensipler açısından, işleyişleri bakımından farklılık gösterir ve bu farkların en önemli noktalarından biri, katılım bankalarının ticari iş yapma yetkisine sahip olmalarıdır. Bu farkların finansal krizlerle etkileşimi nasıl şekillendirdiğini anlamak önemlidir.

Veri Zarflama Analizi (VZA), belirli bir karar birimi sayısının verimliliğini hesaplamak için güçlü bir yöntemdir. Bu yöntemin uygulanabilmesi için karar birimleri karşılaştırılabilir olmalıdır. Bu çalışma kapsamında, 2019-2022 yılları arasında Türkiye'de faaliyet gösteren 30 konvansiyonel banka ve 6 katılım bankasından veri toplandı.

Veri Zarflama Analizinde, bankaların konsolide olmayan yıl sonu bilançolarındaki toplam varlık, öz kaynaklar, çalışan sayısı ve şube sayısı değişkenleri girdi olarak, bankaların bu girdileri ne kadar verimli kullandığını ve bunları pazar payına dönüştürdüğünü gözlemlemek amacıyla mevduatlar, verilen krediler ve bankanın net kârı ise çıktı olarak kullanıldı.

Son olarak, iki banka türü ayrıldı ve 4 yıllık ortalama etkinlik değerlerinin ortalaması alındığında, konvansiyonel bankalar için 0.91 ve katılım bankaları için 0.98 etkinlik ortalaması elde edildi. Bankaların etkili bir şekilde işlemesi ve ekonomik krizler sırasında faaliyetlerini sürdürmeleri kritik önem taşımaktadır. Bu zorlu pandemi dönemini, VZA kullanılarak incelendiğimizde, katılım bankalarının daha etkin olduğu gözlemlenmiştir. Ayrıca, şube ve personel sayısındaki sürekli artış, krizden güçlenerek çıktıklarını göstermektedir.

ANAHTAR KELİMELEER: Katılım Bankacılığı, Konvansiyonel Bankacılık, Verimlilik Analizi, Kriz Dönemleri, Finansal Performans.

1. INTRODUCTION

The COVID-19 pandemic has spread rapidly around the world, causing both a health crisis and an economic crisis at the same time [1]. The first case in Turkey was announced in March 2020, and the normalization process in Turkey began in April 2022 [2,3].

During the pandemic, people were confined to their homes, businesses were closed or subjected to restrictions, the tourism sector suffered significantly, global supply chains faced disruptions, and economies began to contract [4-7]. This situation led to increased global unemployment and economic uncertainty in the financial situations of the countries especially in terms of banking all over the world [8].

Therefore, the COVID-19 pandemic is of particular importance in terms of the size and speed of the economic crisis as it affects many sectors and countries [9]. So, there were job losses, income decreases and business bankruptcies due to the pandemic [10]. During the COVID-19 pandemic, economic growth rates decreased and many countries came to the brink of recession [11,12]. For these reasons, as discussed in this study, the economic effects of the epidemic globally are of great importance.

In this study, we investigate the economic consequences of the COVID-19 pandemic, which started in November 2019, on the financial performances of the participation and conventional banks in Turkey. For this aim, annual data of the banks in Turkey between 2019 and 2022 are used in this study including 30 conventional banks and 6 participation banks (<https://verisistemi.tbb.org.tr>). To achieve this purpose, using an input-oriented returns to scale model, the efficiency of both types of banks will be measured through Data Envelopment Analysis (DEA).

So in this study, to investigate the financial performances of the banks in Turkey during the COVID-19 pandemic, the importance of the distinction between participation banks and conventional banks is based on the differences in terms of their fundamental philosophies and operations. This distinction can be significant in managing and mitigating the economic impacts of the financial performances of the banks during and after the COVID-19 pandemic as follows;

Principle of Interest-Free Finance: Participation banks operate based on interest-free financial principles in compliance with Islamic Sharia. This guides lending and investment activities differently, offering interest-free financial products. Therefore, the financial stability and justice that interest-free finance can provide are important during economic crises [13].

Risk-Sharing: Islamic finance is based on the sharing of risks and gains. This could promote more balanced and fair investment and credit transactions, and aid better risk management during economic crises [14].

Social Responsibility: Islamic finance institutions place greater emphasis on social and environmental responsibilities. Hence, they may be more effective in implementing social support and assistance programs during the pandemic [15].

So how the participation banks and conventional banks behave during the crisis and contribute to their financial systems are important in managing the economic crisis and accelerating economic recovery in the pandemic and post-pandemic periods. Therefore, both types of banks play a crucial role in maintaining balanced financial systems after the pandemic.

The DEA has been used extremely popularly as an efficiency analysis, especially for comparing the financial performance of countries' banking sectors during and after epidemics. Studies containing the performance analysis of the DEA method in the economic situations of the countries in terms of participation and conventional banks are given as follows;

Er and Uysal (2012) dealt with the efficiency performance of four participation banks and twenty-six conventional banks in the Turkish banking sector between 2005 and 2010, and also they indicated that participation banks were more efficient than conventional banks in terms of total efficiency indicators [16].

Aktaş and Avcı (2013) utilized the input/output-oriented DEA method to determine efficiency scores while comparing the efficiency performance of the participation banks and public-private conventional banks in Turkey between 2009 and 2011 and they indicated that public conventional banks ranked first in terms of efficiency performance, followed by private conventional banks [17].

Ada and Dalkılıç (2014) employed the DEA method to analyze the scale efficiency, efficiency changes, and total factor productivity of twenty-two participation banks, consisting Turkey and Malaysia during the period of 2009-2011. They revealed that the scale efficiency performance of the participation banks in Turkey was higher than Malaysia [18].

Acar et al. (2015) analyzed the efficiency performance of domestic and foreign private banks, public banks, and participation banks in Turkey for the years 2009-2013 based on their ownership structure and they stated that among the four bank groups, public banks were the leaders in terms of efficiency scores, followed by private banks, participation banks, and foreign private banks, respectively [19].

Yücel et al. (2015) investigated the factors influencing the performance of participation banks in Malaysia and Turkey through an examination of the banks' efficiencies. Between the years 2009 and 2013, a total of thirteen participation banks, consisting of four from Turkey and nine from Malaysia, were subjected to a performance analysis. This study utilized the DEA and

regression methods. It was noted that the differences within both countries were primarily attributed to the dynamics of their respective banking systems. For instance, in terms of enhancing performance, the capital adequacy of the participation banks in Turkey played a leverage role, whereas in Malaysia, the increase in efficiency in their operations served as a leverage factor [20].

Aktaş and Avcı (2017) measured the Islamic banking performance in MENA countries, Malaysia, and Turkey between 2011 and 2015 by utilizing the DEA method. The analysis of performance revealed that throughout the entire period considered, the two most efficient countries were Malaysia and Iran, while the least efficient countries were Qatar and Turkey [21].

Öztürk et al. (2017) compared the efficiency performance of the conventional banks and participation banks operating in Turkey between 2009 and 2016 by the DEA method. They determined that although the conventional banks increased their efficiency performance each year during the examined periods, they could not reach full efficiency levels [26].

Bektaş and Seki (2018) aimed to measure the competitive performance of the participation banks in Turkey among themselves and in competition with conventional banks. This study analyzed the banks using the DEA method and calculated the Malmquist Total Factor Productivity Index (MTFVE). This study indicates inefficiency for all banks and identifies a decrease in competitiveness performance, attributed to technological recession, in participation banks.

Bolat and Metin (2019) measured the efficiency and productivity of five participation banks in Turkey for the period 2016-2017 by the DEA and MTFVE methods. In 2016, under the output-oriented approach, the same banks were also found to be efficient in return to scale models. In 2017, under the input-oriented approach, one of the five participation banks was found to be efficient in return to scale models. The output-oriented approach also revealed that in 2017, one of the five participation banks was efficient.

Altumur (2019) compared the efficiency performances of five participation banks in Turkey. They analyzed return to scale models under the output-oriented approach using the DEA method. The analyses concluded that between 2009 and 2016, all five participation banks were efficient, and by 2016, both their efficiency and asset sizes had increased.

Ertürkmen and Bolat (2020) compared the efficiency and profitability of participation banks and privately owned conventional banks in Turkey. In their analysis of twelve banks, including three participation banks and nine conventional banks, between 2010 and 2018 using the DEA method and MTFVE, they found that participation banks were not, on average, efficient and productive, while only one of the conventional banks was efficient and productive. It was observed that participation banks were more efficient in the years according to the fixed return to scale model compared to the years they were not efficient. In contrast, most conventional banks were found to be inefficient in the years under examination.

Widagdo and Ika (2008) compared the impact of the issuance of a fatwa on interest in 2004 on all banks in Indonesia for the years 2002-2003 and 2004-2005. They found that there was no statistically significant difference in the financial performance of Islamic banks when comparing before and after the issuance of the fatwa [27].

Arslan and Ergeç (2010) examined the efficiency of 26 conventional banks and 4 Islamic banks in 2006 and 2009 using the DEA. It was found that in 2006, out of 10 banks that were not efficient, 3 were Islamic banks, while in 2009, out of 11 banks that were not efficient, 1 was an Islamic bank [28].

Kablan and Yousfi (2011) aimed to measure the efficiency performance of Islamic banks in seventeen countries for the period of 2001-2008 using the Stochastic Frontier Analysis (SFA) approach. It is concluded that Islamic banks, in general, exhibited an average efficiency of approximately 92.72%, although regional differences were noted [29].

Abduh et al. (2013), utilizing the methods of the DEA and ratio analysis, analyzed the efficiency and performance of five Islamic banks in Bangladesh for the period of 2006-2010. According to the research, one of the Islamic Banks outperformed other Islamic banks in terms of ROA (Return on Assets), ROE (Return on Equity), ETA (Equity to Total Assets), CAR (Capital Adequacy Ratio), IER (Income Expense Ratio), and AU (Asset Utilization) ratios. First Security Bank was mentioned as the best-performing bank in terms of efficiency [30].

Moualhi (2015) used the DEA method to measure the efficiency performance of the Islamic banks in MENA countries for the period of 2006-2012. In this study, both constant returns to scale and variable returns to scale models were applied. This research highlighted that, during the examined period, technical inefficiency stemmed solely from pure technical inefficiency, except for the year 2008, and not from scale inefficiency. This was attributed to the managerial inefficiency in the effective utilization of resources by the Islamic banks. Another finding was the tendency of smaller-scale banks to exhibit increasing returns to scale, while larger-scale banks showed decreasing returns to scale and constant returns to scale [31].

Farandy et al. (2017) aimed to measure the efficiency of Islamic banks in Indonesia for the years 2011-2014. They used the DEA and Tobit regression models to analyze ten banks for the respective years. The analysis results indicated that the real average efficiency of the Islamic banks in Indonesia was quite high, with an average score of 91.82 points. This suggested that despite relatively low efficiency, Islamic banks in Indonesia were able to optimize their resource inputs to produce outputs as intermediary institutions. According to the tobit model; asset variable, the number of bank branches, and ROA significantly influenced the efficiency of the Islamic banks, while capital adequacy ratio and non-performing financing had no significant empirical impact on efficiency [32].

Batir et al. (2017) examined the technical efficiency, allocation efficiency, and cost efficiency of the conventional and Islamic banks in Turkey using the DEA method. After obtaining these efficiencies through the DEA intermediary approach, the factors affecting their profitability were analyzed using the tobit regression method. According to the DEA analysis for the years 2005-2013, the average efficiency of the Islamic banks was found to be better than that of conventional banks for each year. Tobit regression results indicated that expenses and credit quality had a significantly negative relationship with the efficiency of conventional banks, while they had a positive and significant relationship in Islamic banks. A positive and significant relationship was found in both bank types for the total loans ratio, and there was a significant negative relationship with external variables [33].

Khan et al. (2018) aimed to measure and compare the banking performance of the conventional and Islamic banking sectors in Saudi Arabia for the period of 2008-2016 by utilizing the DEA method. This study attempted to measure both bank-specific and sector performance. According to the analysis results, there was a mixed trend in achieving technical efficiency, pure technical efficiency, and scale efficiency for the banks. It was observed that both conventional and Islamic banks were successful in increasing their efficiency levels with the expansion of market share through joint commitment [34]

Çelik et al. (2019) measured the performance of the participation and conventional banks operating in the Turkish banking system for the period 2015-2018 using the DEA method. According to the findings of this study, for deposit banks, the minimum efficiency average in

2018 was 62%, and the maximum efficiency average was 69% in 2017. For the participation banks, the minimum efficiency average was 73% in 2018, and the maximum efficiency average was 96%. According to the constant returns to scale model, Deutsche Bank and Turkish Bank were the most efficient banks among deposit banks, and Ziraat Participation Bank stood out among participation banks. It is also indicated that according to the CCR model, participation banks were superior in terms of average efficiency compared to deposit banks in all years except 2016. According to the variable returns to scale model, the minimum efficiency average for deposit banks was 76% in 2017 and 81% in 2016, while for participation banks, it was 72% in 2016 and 85% in 2015 [35].

Samad (2021) analyzed the performance of Islamic banks in the Gulf Cooperation Council (GCC) countries using the DEA method for the years 2014-2016. It is concluded that Islamic banks in Qatar outperformed and were more efficient than Islamic banks in all other countries within the GCC. Islamic banks in the other GCC countries, excluding Qatar, were found to be less efficient [36].

2. MATERIALS AND METHOD

2.1. Materials

In this study, we investigated the economic consequences of the COVID-19 epidemic, which started in Wuhan, China, in November 2019, on participation banks and conventional banks. The first case in Turkey was announced in March 2020, and normalization began in April 2022. For this reason, the 2019-2022 year-end data of banks, including 30 conventional banks and 6 participation banks, were used. The efficiency of both types of banks was measured through DEA using the input-oriented returns to scale model.

In this study, the DEA was used to measure the growth and profit efficiency of banks during the crisis period. The most frequently used inputs and outputs in the literature given in Table 1 were examined [37]. Therefore, total assets, the number of employees, the number of branches and equity, as well as how much they have collected in funds (deposits), how much they have reached in terms of loan size, and how much profit they made were examined. Total assets refer to the total value of financial assets that a bank possesses. This can include cash, loans, securities, and other investments. The number of employees indicates the total number of employees in a bank. This includes all personnel working in management, operations, sales, and other departments. Equity represents the total value of equity capital that a bank possesses. Equity capital is calculated by subtracting a bank's liabilities from its assets. It indicates the extent to which a bank relies on external sources. The number of branches refers to the total count of physical branches or subsidiaries that a bank possesses. The number of branches is an important metric for assessing a bank's overall market presence, distribution efficiency, and customer accessibility. Deposits are banks collect money from customers and record it in deposit accounts. Loan denotes the amount of debt extended by banks to customers. Loans are used to assist individuals, businesses, or other organizations in meeting their financial needs. Net profit represents the profit remaining when total expenses is subtracted from total income that a bank earns during a specific period.

The data has been obtained from the independent audit reports of banks and official institutions in Turkey (https://verisistemi.tbb.org.tr/index.php?/tbb/report_mali, <https://veripetegi.tkb.org.tr>, <https://www.bddk.org.tr/BultenAylik/tr/Home/Gelismis>).

Table 1. Inputs and outputs used in the DEA

Inputs	Outputs
Total Assets (thousand TL)	Period Net Profit (thousand TL)
Number of Employees	Deposits (thousand TL)
Equity (thousand TL)	Loans (thousand TL)
Branch Count	

In calculating the DEA, it is important that inputs and outputs are not negative or zero. Due to this requirement, four deposit banks were excluded from our analysis because they made a loss or reported zero value in the net profit category: Bank of China Turkey reported zero profit in 2020, Burgan Bank A.Ş. It made a loss in 2020, Şeker Bank in 2019, and finally Turkland Bank in 2019. Thus, the banks and participation banks whose data are included in the analysis for the period 2019-2022 are as given in Table 2.

Table 2. Banks whose data are included in the analysis for the years 2019-2022

CONVENTIONAL BANKS			PARTICIPATION BANKS
Akbank Corp.	Fibabanka Inc.	Şekerbank Corp. ^a	Albaraka Türk Participation Bank Inc.
Alternatifbank Inc.	Habib Bank Limited	Turkish Bank Inc.	Emlak Participation Bank Inc.
Anadolubank Inc.	HSBC Bank Inc.	Turkland Bank Inc. ^a	Kuveyt Türk Participation Bank Inc.
Arap Türk Bank Inc.	ICBC Turkey Bank Inc.	Türk Ekonomi Bankası Inc.	Türkiye Finans Participation Bank Inc.
Bank Mellat	ING Bank Inc.	Türkiye Cumhuriyeti Ziraat Bank Inc.	Vakıf Participation Bank Inc.
Bank of China Turkey Inc. ^a	Intesa Sanpaolo S.p.A.	Türkiye Garanti Bank Inc.	Ziraat Participation Bank Inc.
Burgan Bank Inc. ^a	MUFG Bank Turkey Inc.	Türkiye Halk Bank Inc.	
Citibank Inc.	Odea Bank Inc.	Türkiye İş Bank Inc.	
Denizbank Inc.	QNB Finansbank Inc.	Türkiye Vakıflar Bank Corp.	
Deutsche Bank Inc.	Rabobank Inc.	Yapı ve Kredi Bank Inc.	

a: After inputs and outputs were determined, they were excluded from 4 conventional bank datasets containing zero or negative values.

2.2 Method

The data envelopment analysis (DEA) method has been used extremely popularly as an efficiency analysis to compare the financial performance of the banking sector of countries. The DEA method ensures that units with similar tasks, using the same inputs, and producing the same outputs are measured under a similar efficiency measurement structure. The DEA is a mathematical-based method that simultaneously evaluates a large number of variables under certain constraints. To achieve better results with the DEA, measurements should be made with more than one input and output [38].

In the DEA method, it is assumed that there is a boundary surrounding the Decision Making Units (DMUs). DMUs above this boundary are considered efficient, while others are considered inefficient. The stages of applying the DEA are summarized in Yıldırım et al. [39]. In the DEA method, the chosen DMUs should have a homogeneous structure. Units use the same input variables to produce the same output variables. A sufficient number of DMUs should be selected in the DEA. There are various opinions on this matter, with one suggesting that the number of DMUs should be at least twice the number of input and output variables [40]. Inputs and outputs should be structured to best reflect the effectiveness of DMUs. If an input or output is left missing, the efficiency of DMUs may differ from expected. If there are the DMUs with missing data, these units may be excluded from the analysis. There are several software packages available for solving DEA models, with the most commonly used ones being DEA Solver, Frontier Analyst, DEAP, EMS, and Warwick DEA.

In the DEA, the relative efficiencies of DMUs are generally expressed as values between 0 and 1. Efficient DMUs create an efficiency frontier and receive an efficiency score of 1. DMUs with efficiency scores different from 1 are considered relatively inefficient. In the DEA, a reference set is determined for each relatively inefficient DMU. A group composed of relatively efficient DMUs forms a reference set for relatively inefficient DMUs. By considering the inputs and outputs of relatively efficient DMUs in the reference set, target values and potential improvements can be identified for inefficient DMUs. This allows policymakers to develop strategies to make units efficient. CCR model and BCC model are the most frequently used models in the DEA [41].

CCR Model: In this model, the measurement of total efficiency is conducted under the assumption of constant returns to scale [42]. Without changing the output level, input-oriented CCR model focuses on researching how input units should be modified to efficiently achieve this output level [45,46]. The objective function and constraints for the CCR model adapted to linear programming can be defined as in objective function Eq. (1) and constraints in Eq. (2) and Eq. (3).

Objective function:

$$E_o = \min \sum_{i=1}^m v_i x_{io} \quad (1)$$

Constraint equations:

$$\sum_{r=1}^s u_r y_{ro} = 1 \quad (2)$$

$$\sum_{r=1}^s u_r y_{rj} \leq \sum_{i=1}^m v_i x_{ij} \quad (3)$$

$$v_i, u_r \geq \varepsilon \quad r = 1, 2, \dots, s \quad i = 1, 2, \dots, m \quad j = 1, 2, \dots, n$$

Here ε , is a sufficiently small number ($\varepsilon \leq 10^{-6}$). n is the DMUs number; s is the outputs number; m is the inputs number; u_r is the weight for the output r by DMU o ; v_i is output quantity r achieved by DMU o ; y_{ro} is output quantity r achieved by DMU o ; x_{ij} is input quantity i achieved by DMU j ; y_{rj} is quantity of output r achieved by DMU j .

BCC Model: BCC model is emerged by Banker et al.[43] and Banker and Thrall [44] by adding the convexity constraint to the CCR model. This model has been formulated under the assumption of variable returns to scale. In the BCC model, unlike the CCR model, there is the following convexity constraint form of the DEA in Eq. (7). In the input-oriented BCC model, the objective is the same as in the input-oriented CCR model, which is to minimize inputs [45].

Objective function:

$$E_o = \max \sum_{r=1}^s u_r y_{ro} - u_o \quad (4)$$

Constraint equations:

$$\sum_{i=1}^m v_i x_{io} = 1 \quad (5)$$

$$\sum_{r=1}^s u_r y_{rj} - u_o \leq \sum_{i=1}^m v_i x_{ij} \quad (6)$$

$$\sum_{j=1}^n \lambda_j = 1, \quad \lambda_j \geq 0 \text{ for } \forall j \quad (7)$$

$$v_i, u_r \geq \varepsilon \quad r = 1, 2, \dots, s \quad i = 1, 2, \dots, m \quad j = 1, 2, \dots, n$$

Here ε , is a sufficiently small number ($\varepsilon \leq 10^{-6}$); n is the DMUs number; s is the outputs number; m is the inputs number; u_r is the weight for the output r by DMU o ; v_i is output quantity r achieved by DMU o ; y_{ro} is output quantity r achieved by DMU o ; x_{ij} is input quantity i achieved by DMU j ; y_{rj} is quantity of output r achieved by DMU j . and u_o is unrestricted variable for DMU o .

Figure 1 shows the change in the mean values of input and output variables over the years for conventional banks and participation banks, respectively. According to the Figure 1 the changes in the number of branches and the number of personnel move in opposite directions, while the other variables have shown similar proportional increases or decreases.

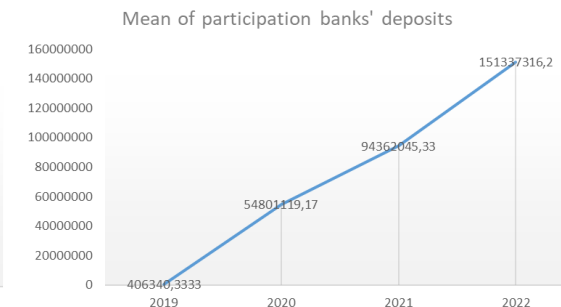
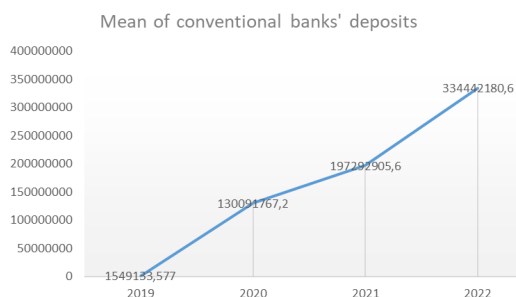
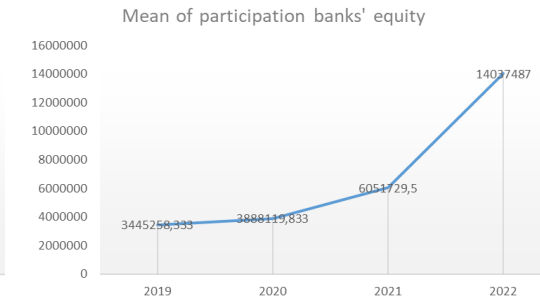
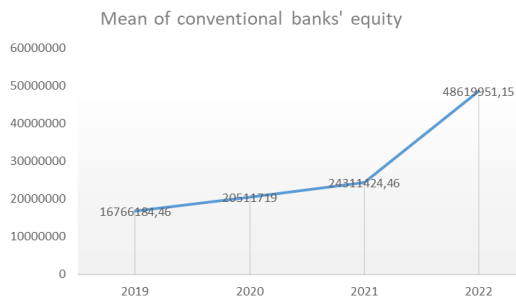
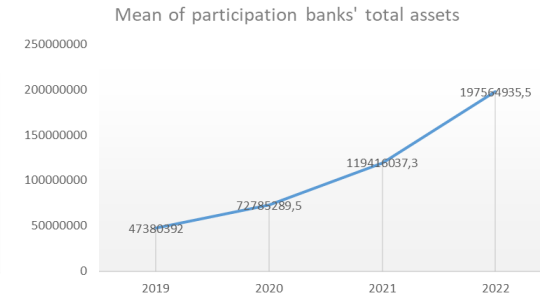
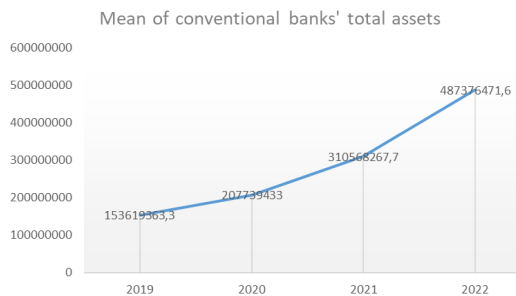
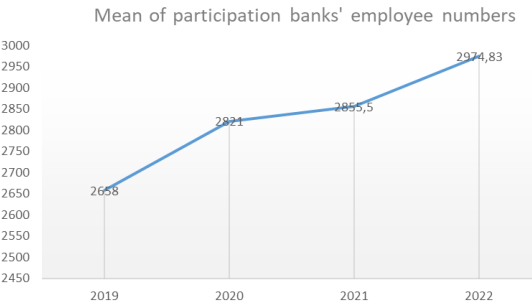
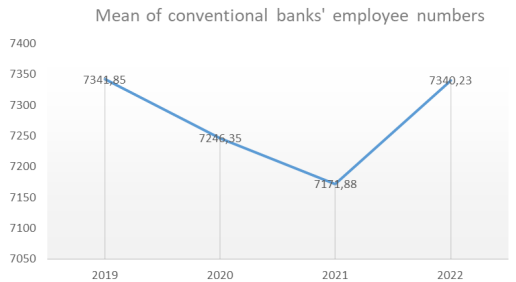
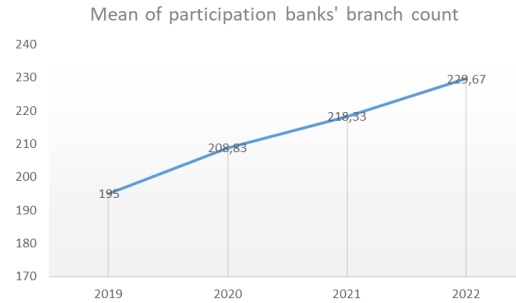
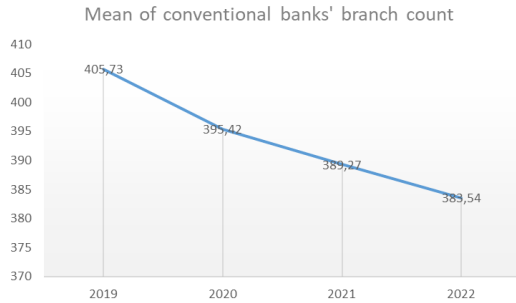




Figure 1. Mean values of input and output variables over the years

3. RESULTS

Data Envelopment Analysis was performed using the DEA library in the R Studio Program. The following packages have been utilized: "Benchmarking", "deaR", "xlsx", "readxl", "writexl", "datasets", "methods", "lpSolve". Additionally, there is an online website for Data Envelopment Analysis specific to the R programming language, which can be easily accessed at <https://rbensua.shinyapps.io/deaR/> without the need for coding.

Table 3. Efficiency values of banks according to the model and sector average efficiency values

DMUs	Efficiency Values				Average Efficiency Values	Average of the Efficiency Averages of Conventional Banks	Average of the Efficiency Averages of Participation Banks
	2019	2020	2021	2022			
Akbank	0.8752	0.8792	0.8341	1	0.8971	0.91	0.98
Alternatifbank	0.8869	0.8419	0.8140	0.8982	0.8603		
Anadolubank	1	0.9341	1	1	0.9835	0.91	0.98
Arap Türk Bank Inc.	0.7245	0.6574	0.5539	0.6018	0.6344		
Bank Mellat	0.6879	0.7503	1	0.7421	0.7951	0.91	0.98
Citibank	1	1	1	1	1		
Denizbank	0.9266	0.9382	0.9003	0.9358	0.92524	0.91	0.98
Deutsche Bank	0.9266	0.9382	0.8854	0.89907	0.9123		
Fibabank	0.9410	0.9889	0.9146	1	0.9611	0.91	0.98
Habib Bank	0.6833	0.5590	0.6492	0.5042	0.5989		
HSBC Bank	1	0.9384	1	1	0.9846	0.91	0.98
ICBC Turkey Bank	0.8062	0.6371	0.9495	1	0.8482		
ING Bank	0.9399	0.9313	0.9143	0.9715	0.9392	0.91	0.98
Intesa Sanpaolo S.p.A.	1	1	1	1	1		
MUFG Bank Turkey	1	0.9250	0.9393	1	0.9661	0.91	0.98
Odea Bank	0.9877	0.8687	0.9224	0.8797	0.9146		
QNB Finansbank	0.9019	0.9094	0.8803	1	0.9229	0.91	0.98
Rabobank	1	1	1	1	1		
Turkish Bank	1	0.9745	0.9787	0.9075	0.9652	0.91	0.98
Türk Ekonomi Bank	0.9319	0.90136	0.90891	1	0.9355		

T.C. Ziraat Bank	0.9757	0.9368	0.9096	0.9297	0.9379
Türkiye Garanti Bank	0.9227	0.9522	0.9447	1	0.9549
Türkiye Halk Bank	0.9738	0.9589	0.9352	0.9819	0.9624
Türkiye İş Bank	0.8888	0.9074	0.9032	0.9459	0.9114
Türkiye Vakıflar Bank	0.97631	0.882	0.85725	0.91063	0.9065
Yapı ve Kredi Bank	0.8657	0.8833	0.8283	1	0.8943
AlbarakaTürk Par. B.	0.9953	0.9645	1	0.9488	0.9771
Emlak Part. Bank	1	1	1	1	1
Kuveyt Türk Par. B.	1	1	0.9289	1	0.9822
Türkiye Finans Par. B.	0.9847	0.9144	0.9169	0.8643	0.9201
Vakıf Participation B.	1	0.9555	0.9585	0.9948	0.9772
Ziraat Participation B.	1	1	1	1	1

The DEA has been conducted for each year separately. The efficiency value of each bank was calculated, and then the averages of the 4-year efficiency values for each bank were determined. Finally, the averages of the efficiency values for participation and conventional banks are presented in Table 3.

The DEA based on constant returns to scale was implemented in R Studio. Table 3 shows that 3 conventional banks were efficient and 2 participation banks were efficient during the pandemic process. The average efficiency is 0.98 and 0.91 for participant and conventional banks respectively.

4. DISCUSSION

The COVID-19 pandemic has greatly impacted healthcare systems around the world and especially the financial sector. In this context, banks have faced challenges brought about by the pandemic. In this study, the DEA covered a span of four years, from 2019 to 2022. To observe the crisis due to the pandemic, the number of efficient and inefficient banks by years is given in Table 4.

Table 4. Efficiencies of the banks by years

Years	Number of Active Bank	Number of Inactive Bank
2019	11	21
2020	6	26
2021	9	23
2022	16	16

The change in the number of efficient banks over time is presented in Figure 2.

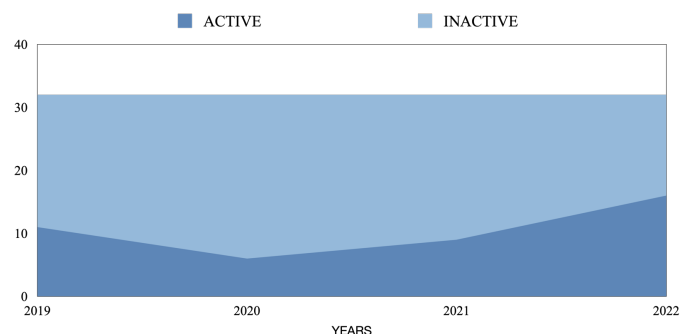


Figure 2. Efficiencies of the banks over the years

Zero and negative values have been excluded for accurate results in the DEA. Bank of China Turkey was excluded from the analysis because it did not disclose profits in 2020, and Burgan Bank was excluded because it reported losses in 2020 among conventional banks. Additionally, Şeker Bank Corp. and Turkland Bank Inc. were excluded from the analysis due to their reported losses in 2019.

The date officially announced as the first COVID-19 case in Turkey in 2020 marks the year when the number of efficient banks reached its lowest level over the four years under examination. When Table 4 is examined, it is observed that in 2020, only 6 banks were efficient in Turkey. The reason for selecting the years between 2019 and 2022 was to observe the pandemic period, pre-pandemic, and post-pandemic periods. It has been observed that analysis results of this study reflect the effects of the crisis, providing a consistent and coherent outcome.

Reviewing the results of the DEA in Table 3, it can be observed that CitiBank, Intesa Sanpaolo, Rabobank, Emlak Participation Bank, and Ziraat Participation Bank have been efficient over four years. Their average efficiency values have been 100%.

Following these banks, the top 5 banks with the highest average efficiency values are HSBC Bank, Anadolu Bank, Kuveyt Turk Participation Bank, Vakif Participation Bank, and Albaraka Turk Participation Bank.

HSBC Bank, Anadolu Bank, and Kuveyt Turk Participation Bank have achieved 98% efficiency, while Vakif Participation Bank and Albaraka Turk Participation Bank have reached 97% efficiency, making them the banks that come closest to 100% efficiency.

5. CONCLUSION

This study confirms that participation banking is more resilient in economic crisis by examining the COVID-19 pandemic. As a conclusion, average efficiency shows that five of the top ten banks are participation banks and reveals that participation banking is more resistant to crises.

As a main conclusion, the most crucial difference between these two systems is that participation banks conduct business with a focus on trade, whereas conventional banks operate with an emphasis on interest.

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CAUSES OF THE GLOBAL ECONOMIC FINANCIAL CRISIS AND CHOOSING ANTI-CRISIS MEASURES

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ABSTRACT

The unpleasant events of last year on a global scale seriously affected all subjects of the world economy and caused a global financial crisis. It cannot be said that the economic and financial crisis was unexpected, since in the late 90s of the last century many scientists spoke about the possibility of this crisis in the near future, but doubted the time of its occurrence and the main causes. We consider the crisis of the beginning of the 21st century, first of all, a crisis of confidence, and anti-crisis programs in many countries are aimed at restoring it, so that citizens again trust banks and the state. The research group, having studied the history of the global economic financial crisis, its causes and the wave of its spread, came to the conclusion that the repetition and deepening of these crises from time to time, as well as a decrease in the provision of financial services, self-regulation of the macroeconomy is a characteristic feature of the global economy. According to our results, in order to effectively reverse the dynamics of the crisis and restore economic stabilization, either states must participate in integration processes and abandon the benefits of the global economy; or they should actively participate in the implementation of anti-crisis measures within the framework of international cooperation by partially limiting national economic sovereignty. Despite the various measures used, one thing is clear: to combat modern GEFC, countries must form an effective economic system, create an adequate set of national policies, and also come to mutual compromise without competing with each other.

KEYWORDS: financial crisis, global crisis, economy, anti-crisis measures, financial market, shares.

INTRODUCTION

The global economic and financial crisis (GEFC) is a research object of numerous classical and modern schools, it is a deterministic set based on positive and negative transformations that regulates the development vectors of the world economy [1]. Justification of crisis events in the global economy; problems of fundamental determinants of crises; despite the existence of numerous studies and publications on the role of functional manifestations in the classification of economic crises, we consider that the mechanism of emergence of financial crises in the global economy, the spread area, and the development of anti-crisis measures have not yet been studied [2].

PURPOSE

Of his research was to study the causes of the formation of the GEFC and anti-crisis measures.

REASONS FOR ITS FORMATION

According to the results of many research materials and scientific works, the reasons for the formation of GEFC are polymorphic, they are the sharp fall in the price of financial assets and the sharp aggravation of the situation in the financial market, the devaluation of the national currency and the problems of debt repayment, the intermediation functions between financial markets and financial institutions. It is characterized by a sharp drop in the exchange rate value of shares as a result of the delay, natural events, pandemics, and wars.

Models and theories have been developed for forecasting economic crises. One of these theories is the Linear "pendulum" model. In this model, the development of the economic system is affected by various types of "shocks", and the shocks are not necessarily regular and repeated after the same time. As an example, I. Schumpeter's theory can be shown, based on which "push" is investment in innovations that stimulate the economy once during the period. This model proves that no two cyclical patterns can exist exactly, and therefore it is impossible to pinpoint the beginning of the next crisis. This model is linear and only represents system oscillations within a sinusoidal curve.

Another model is the "Billiard ball" model. This system is a non-linear model that can be expressed by unlimited credit expansion, investment decline or employment level, which can reflect all possible forms compared to the previous model.

Tinbergen's "web" theorem is an elaborated theory based on a free competitive price mechanism. By increasing the stocks, it is possible to determine the start of production, to determine the difference between the actual stock of durable goods and the desired inventory. According to Tinbergen, when any fund changes, the external disturbance or impulse that keeps the fluctuation is valued as a fixed value.

One of the main theorems reflecting the economic crisis is the Aftalion theorem. The long time required for the production of capital is a characteristic feature of modern industrial methods and is considered the main cause of cyclical fluctuations.

A delay-based model consists of building a system based on delay intervals. The amount of income determined by the multiplier with expenses; relevant actual investment costs; the difference between investment and output is attributed to the lag interval.

When the "overshoot" method rises above the norm based on the "business activity" position, sooner or later a reaction can be expected. Likewise, when business activity falls below normal, sooner or later a move in the opposite direction can be expected, and the greater the "overshoot" and reaction, the greater the magnitude of the bias. According to this theory, in order to understand to what extent the economy is and is not "normally" trending, it is necessary to study the fluctuations that have occurred in the past.

The "lead and lag" method is based on the construction of securities, price changes, inflation, statistical series. In this case, deviations can be a "warning" of the possibility of economic fluctuations. The disadvantage of this method is that the curve deviates from the course, it is impossible to determine in advance whether it will be a signal for a full return, up or down. In this case, it is appropriate to use the method of analysis of strategic areas: the analysis of the ratio of areas or components of strategic importance for the development of the country. In the "measurement of mutual factors" method, the method is aimed at analyzing the factors

influencing the development of the economy on the one hand, and the factors that depress it on the other hand, and evaluating the relative strength of the opposite factors [3, 4].

The first crisis in world history began in 88 BC in the Roman Empire, and the history of crises is reflected in table 1.

Table 1. Economic and financial crises experienced in history

Crises	Years
Economic crisis	1900-19003
"price scissors" economic crisis in the USSR	1923
Great depression	1929-1939
Oil crisis	1973
Energy crisis	1979
Video game industry crisis	1983
Argentina's economic crisis	Late 1990s
Asian financial crisis	1997-1998
Economic crisis in Russia	1998
World financial crisis	2008-2011
Currency crisis in Russia	2014-2015
The coronavirus recession	2020

As can be seen from Table 1, the world economy faced a serious challenge from the beginning of the XXI century. If we look at the history of economic and financial crises experienced in history, the first global economic crisis began in 2008 as a result of the slowdown of economic growth, instability in commodity and financial markets, and a decrease in production and consumption in all sectors of all countries of the planet.

ANTI-CRISIS REGULATORY MEASURES

During the economic and financial crisis, the countries of the world developed their own, different anti-crisis regulatory measures. Thus, Australia financed business centers; Azerbaijan reduced consumer prices to increase citizens' trust in the state and support national banks; Ilgiltara distributed money and stimulated consumption until the situation in the financial markets strengthened; Argentina-doubled the number of jobs in the public sector; Brazil-reduced the cost of production; Germany- changed deposit guarantees to restore citizens' confidence in the banking system; Greece supported the construction business and tourism industry by attracting additional funds to the country's economy; Denmark-created an insurance fund to guarantee deposits; In order to increase the liquidity of the Indian-banking system, it reduced the discount rate; Canada-implemented \$3 billion in economic financing to reduce unemployment; China created the Economic Development Stimulation Program to develop infrastructure in rural areas, reduce VAT and support demand among the population; USA-Created the TA11P program to restore citizens' confidence in the government and banking system, etc.

DISCUSSION

Thus, A. Smith considers the need to accumulate enough money, not cyclical development in the system, to solve the central problem of the crisis [5]. Gallatin A. argued: "All active, enterprising commercial countries are inevitably subject to crises. A series of favorable years in succession will inevitably lead to excessive expansion of monetary transactions. These shocks, in proportion to the strengthening of the entrepreneurial spirit, the expansion or abuse of credit, will become more will be frequent and large [6].

J. Mills considered the cause of the crisis to be wrong ideas about the psychological essence of entrepreneurial subjects. A. Marshall evaluates the crisis as a phenomenon related to the reckless expansion of credit and the lack of trust between the lender and the borrower [7]. A. Aftalion believes that cyclical movements essentially consist of fluctuations in the production of elements of fixed capital [8].

According to the opinion of Azerbaijani economist V. Zeynalov, a financial crisis is a sharp fall in the price of financial assets or a sharp worsening of the situation in the financial market, especially the devaluation of the national currency and the problem of sovereign debt repayment, the failure of the mediation function of the financial market and financial institutions, and a sharp drop in the exchange rate value of shares [2].

Methodological analysis of the main causes of economic crises allows us to determine the following regularity: if at first the crises were related to the imbalance in the field of production development and extraction of natural resources, then they are related to the existence of gold reserves [9]. The world economy, the dynamics of consumer goods prices, the main causes of cyclical fluctuations in the world economy, the asynchrony of the pace of development of real production and financial markets can be mentioned.

CONCLUSION

The working group of the study investigated the history, causes, and wave of spread of GEFC events and came to the conclusion that the recurrence and deepening of these crises from time to time, the reduction of financial self-regulation of macroeconomics is a characteristic feature of the global economy. According to our results, in order to effectively reverse the dynamics of the crisis and restore economic stabilization, either the states must participate in the integration processes and give up the benefits of the global economy; or they should actively participate in the implementation of anti-crisis measures within the framework of international cooperation by partially limiting national economic sovereignty. Despite the various measures used, one thing is clear that in order to fight against the modern GEFC, countries should form an efficient economic system, create an adequate set of national policy measures, and countries should come to a mutual compromise without competing among themselves.

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CONSEQUENCES OF DAMAGE TO KARABAKH RIVERS AND RESERVOIRS

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ABSTRACT

Eco-terrorism and environmental abuse in the Nagorno-Karabakh region and its surrounding areas pose a serious threat not only to the flora and fauna of the country, but also to peace and security. This increases the feeling of hatred in people.

As you know, the Nagorno-Karabakh territory of our republic has rich water resources. The source of each of the rivers of the Lesser Caucasus is the Kura or Araz rivers. Among them are the Tartar River, the Gargarchay River, the Khachinchay River, the Bargushadchay River, the Gekarichay River, the Kolatag River, etc. this is important from the point of view of water security. In order to use the water resources of Karabakh, occupying Armenia is building a hydroelectric power station on them. It is no coincidence that, along with the Sarsang hydroelectric power station (50 MW), built on the Terter River, 13 small hydroelectric power stations (44 MW) were built on the occupied lands.

In addition, it should be noted that the Sarsang, Khachin and Araz reservoirs are also located in Karabakh. However, these reservoirs, built during the Soviet Union, have been in use for a long time, but these reservoirs are still in use.

The river, which is the richest water in Karabakh, was widely used by the Armenian side in the environmental war, and when checking the technical composition of the water, it became known that harmful chemicals were discharged into the river. Therefore, a criminal case should be initiated on all these facts.

KEYWORDS: Karabakh, rivers, reservoirs, convention, environment, war.

KARABAĞ NEHİRLERİ VE REZERVUARLARIN ZARARLARININ SONUÇLARI

ÖZET

Dağlık Karabağ bölgesi ve çevresindeki bölgelerdeki eko-terör ve çevre istismarı, yalnızca ülkenin flora ve faunasına değil, aynı zamanda barış ve güvenliğe de ciddi bir tehdit oluşturuyor. Bu da insanlarda nefret duygusunu artırıyor.

Bildiğiniz gibi Cumhuriyetimizin Dağlık Karabağ bölgesi zengin su kaynaklarına sahiptir. Küçük Kafkasya'daki nehirlerin her birinin kaynağı Kura veya Araz nehirleridir. Bunlar arasında Terter Nehri, Gargarçay Nehri, Haçinçay Nehri, Bargushadçay Nehri, Gekarichay

Nehri, Kolatag Nehri vb. su güvenliği açısından önemlidir. Karabağ'ın su kaynaklarının kullanılması için İşgalci Ermenistan üzerlerine hidroelektrik santral inşa ediyor. Terter Nehri üzerinde inşa edilen Sarsang hidroelektrik santralinin (50 MW) yanı sıra, işgal altındaki topraklarda 13 küçük hidroelektrik santralinin (44 MW) inşa edilmesi tesadüf değildir.

Ayrıca Karabağ'da Sarsang, Haçin ve Araz rezervuarlarının da bulunduğunu belirtmek gerekir. Ancak Sovyetler Birliği döneminde inşa edilen bu rezervuarlar uzun süredir kullanılıyor ancak bu rezervuarlar halen kullanılıyor.

Karabağ'ın en zengin suyu olan nehrin çevre savaşında Ermeni tarafı tarafından yaygın olarak kullanıldığı, suyun teknik bileşimi incelendiğinde nehre zararlı kimyasalların atıldığı öğrenildi. Dolayısıyla tüm bu gerçekler üzerinden ceza davası açılmalıdır.

ANAHTAR KELİMELEER: Karabağ, nehirler, rezervuarlar, kongre, çevre, savaş.

The Karabakh War, which began in 1988, was fueled by the territorial claims of the Armenian SSR to the Azerbaijan SSR and turned into a terrorist state. Hostilities ended in 1994. The reason for this was the signing of a truce between Azerbaijan and Armenia. As a result of this terror, approximately 30,000 people died. It is unfortunate to note that a part of Azerbaijan called Nagorno-Karabakh and 7 administrative regions around it were occupied by the armed forces of Armenia.

The Second Karabakh War was one of the greatest triumphs and victories won by Azerbaijan in history. On September 27, 2020, the historical and ancient lands of the Republic of Azerbaijan were liberated from occupation during the Second Karabakh War, having spent 30 years under the feet of the enemy. The Second Karabakh War changed the geography of the South Caucasus. This resulted in enormous human losses and did not resolve the underlying political differences between Armenia and Azerbaijan. However, this conflict brought the prospect of new trade links and increased economic cooperation in the region for the first time in memory. According to the Rio Declaration on Environment and Development, adopted in 1992, wars should not have a destructive impact on sustainable development. For this reason, countries around the world must respect international law that protects the natural environment during armed conflicts. It is with great regret that we note that Armenia does not expect these principles; on the contrary, they brutally destroy these principles and plunder the environment in the territories they occupied [1, p. 150].

One of the most beautiful examples of the fascinating nature of Karabakh are our rivers. However, our hated enemies have destroyed all our natural beauties and polluted our rivers in huge quantities by dumping industrial, household and other wastes and causing harm to the rivers and the creatures living in them. After the liberation of our lands, the sights we saw were not at all pleasing. First I want to give general information about the rivers of Karabakh.

Our rivers, originating in the Karabakh zone of Azerbaijan, flow into the basins of the Kura and Araz rivers or into other rivers belonging to this basin. There are mountains with high peaks around Karabakh. These mountains are located between the basins of the Kura and Araz rivers, playing the role of a watershed. Rain and snow waters played a major role in the feeding regime of the rivers of Karabakh. River water is also used to irrigate agricultural land. Our rivers, which originate from the volcanic plateau, are the Tartar River and the Gekari River. Our river sources in the northwestern part of the plateau are Arpachay with a length of 128 km and Bazarchay with a length of 178 km. The sources of nutrition for these rivers are rainwater, groundwater and underground water. For this reason, there is a danger of flooding of these rivers. This coincides with the hot periods of the year. Among the rivers flowing from the southeastern slope of the Lesser Caucasus, we can cite Gekarichay, Khachinchay, Gargarchay, Okchuchay and Tartarchay as examples. These rivers are used to irrigate our Mil and Karabakh plains.

The Tarter River originates in the Kelbajar region and flows into the Kura River. It flows through the territory of many regions until it flows into the Kura River. It flows from the Agdara, Terter and Barda regions and is used for irrigation. The Tartar River has 3 main tributaries. Ayrym, Tutgu and Lev and their rivers are tributaries of the Tartarchay. The Sarsang reservoir, one of the most important reservoirs and of great importance in irrigation, was created on this river. The elevation difference between the beginning and end of the river is 3117 m.

Volcanic plateau and rivers of the Karabakh ridge



Source: [11]

Khachinchay originates in the Kelbajar region. This river, like the Tatar River, flows into the Kura River. Khachinchay flows through the Aghdam, Terter and Barda regions and is used for irrigation of these areas. The total length of the river is 119 km. The elevation difference between the source and the mouth of the river is 2090 m.

Kondalanchay originates in the Shusha region. This river flows into the Araz River and flows through the Khojavend and Fizuli regions. Kondalanchay is a left tributary of the Araz River and has a length of 102 km. The height difference between the source and the outlet is 1780 meters.

The Bargushad River, or in other words Bazarchay, originated from the territory of the Republic of Armenia. This river plays an important role in the water supply of Kelbajar, Gubadli and Zangilan regions and flows into the Araz River. The Bargushad River is the left branch of the Araz River and has a length of 164 km. This river is joined by small tributaries such as the Agali, Bakhtiyarli and Davudlu rivers from the Gubadli region.

The rivers are polluted by industrial waste and domestic waste generated at large industrial and residential facilities located in the areas around this river. During the occupation of our lands, the Republic of Armenia polluted this river in large quantities, and the rich and valuable species of fish in the river. were looted and destroyed by the occupiers. In another case, the reason for the massive fish death here was that the fish were poisoned and killed by mixing chemicals into the water.

The Gekari River originates in the Lachin region. The Gekari River, originating at an altitude of 3080 m, flows from the Gubadli and Zangilan regions and is used to irrigate these areas. This river is the left branch of the Araks and has a length of 128 km. The height difference between

the source and the outlet is 2812 meters. The water of this river is mainly used for drinking and irrigation. Here, among the valuable species of fish, there are farel, kutum, and others. Such species spawn in abundance in this river. Okchuchay, one of the most polluted rivers of Karabakh, flows mainly from the Zangilan region, taking its source from Mount Kapić, located in the Zangezur ridge. Okchuchay is the left branch of the Araz River and has a length of 85 km. The biggest cause of pollution in Okchuchaya is the chemically contaminated waters coming from the Gajaran copper-molybdenum plant, located on the territory of the Republic of Armenia, as well as the Gafan copper smelter, and the biologically and chemically contaminated waters of the Gafan-Gajaran city, as well as hospitals in the villages there, as well as other agricultural objects, without processing directly into the territory of Azerbaijan. It flows into the river in front of the village of Sharikan, that is, into Okchucha, which is the river basin in the so-called “dead zone”. For these reasons, Okchuchay is one of our rivers facing environmental terrorism [3].

Monitoring was carried out by many local and foreign ecologists to study the ecological state of rivers flowing across the border in our country. For this purpose, during monitoring carried out from January to June 2021, numerous water samples were taken from Okchuchaya. These samples were analyzed in both local and international laboratories. The result of analysis in the internationally accredited and certified SGS laboratory in Germany is that iron, copper, molybdenum, manganese, chromium and zinc, containing large amounts of heavy toxic substances, were found in the water. According to the reports of these monitoring, it can be said that from the point of view of Armenia, the level of pollution in Okchuchaya exceeded the norm several times. For example: the amount of copper-molybdenum compound in river water was twice the norm, iron – four times, nickel – seven times. For this reason, the visual beauty of the river has also disappeared. Because the color of the water has changed due to current indicators [2, p.139].

When investigating the contamination of Okchuchaya, attention was paid to other reasons. The main reason for the pollution of the Okchuchay River with such toxic and harmful waste is the pollution caused by factories operating in this part of the river in the cities of Gafan and Gajaran as it passes through the territory of Armenia. Thus, the German company Kronimet Holding is considered the main taxpayer in Armenia. It is known that Armenia owns 60% 100% of the shares of this industrial enterprise. This industrial enterprise operates a copper ore processing plant in the Gafan region. In addition, the Zangezur Copper-Molybdenum Combine (ZMMK) company operates in Qajar. This company is engaged in the exploitation of copper-molybdenum reserves, which are considered the largest mining resource in the country. For this reason, the discharge of heavy chemical waste by this company into the river without treatment has led to great pollution of Okchuchaya.

From all that has been said, we can conclude that today Okchuchay acts as a kind of collector and plays a role in the disposal of industrial waste. Even now this river continues to be heavily polluted. As a result of this, the existing fauna and its ecosystem in Okchuchay continue to deteriorate, and for this reason, the fact of mass death of fish in the river was revealed. Thus, during the entire visual observation, they observed the death of many fish listed in the Red Book of Azerbaijan. Examples of these fish include small trout and trout, shirbit and other types of fish. This terrible scene once again proves how critical the level of pollution in Okchuchaya is. At the same time, it should be said that according to the basic facts, due to mining in the surrounding mines and the increase in its volume, more water resources are used, which can completely lead to the danger of Okchuchaya. dries up and disappears in the coming years.

The main reason for the increase in production from mines in these surrounding areas was the sharp increase in demand for copper, gold and other precious metals in the world market in recent years. This was a positive situation for Armenia. Because our enemies' economy was in

recession. Their countries have very few financial resources, and the increase in these needs and the expansion of production in the mines became an additional source of income. Before this, in 2009, the world experienced a global financial crisis. Because of this, the economies of many countries fell into decline. The increase in metal prices on the world market was considered an important event for the Republic of Armenia. New jobs were opened here and additional financial resources were received. As a result, the role of the mining industry in the country's economy has increased significantly [6].

According to statistics, 51% of goods and commodities exported in recent years are from mining products. In terms of indicators, the mining industry occupied second place in the structure of industrial production by production area, approximately 20%.

According to statistics provided by the Customs Service of Armenia, copper condensate ranks first among products exported from the country in 2019. This is worth US\$627 million. However, since July 2019, Tegut, a disputed field with the neighboring country, the Republic of Georgia, has been brought back into production. This means an increase in copper condensate exports by 32% compared to last year.

Basically, mining products produced in Armenia were concentrated in these regions. About 87% of the production came from the West Zangezur region. Looking from this point of view, we see that there is a high probability of contamination of the lower reaches of Okchuchaya in Armenia. This is causing great concern to other neighboring countries. Since many neighboring countries are concentrated in the lower reaches of the river, pollution of the river will have a negative impact on the natural conditions of these countries. Due to the deteriorating environmental situation, the economy also suffered. Although these territories are currently free from occupation, these situations have created great dangers for our ecology and economy.

Based on the monitoring carried out by the Armenian government in Okchuchay in 2017, it became known that Okchuchay water belongs to the 5th category. This category is recorded in the lowest quality waters. The institution that carried out this monitoring was the Armenian Center for Environmental Monitoring and Information. For these reasons, the most polluted Okchuchay River was prohibited from being used for irrigation. Okchuchay, as is known, is a transboundary river flowing through the territory of many countries. Thus, the constant pollution of this river on the territory of Armenia will create serious problems in the process of irrigating our agricultural lands and does not play a role in meeting the need for drinking water. The use of this river in irrigated areas or for water supply is considered a real threat to the health of the country's population. Drinking such dirty water causes serious problems for people. Diseases of the gastrointestinal tract, nervous system, etc. can be an example of this.

Another alarming situation related to Okchuchay is that the toxic waters of Okchuchay first flow into the inner basin of the Araz River, that is, into the Khudafar reservoir. Then it flows into the Caspian Sea. This creates a high level of environmental crisis in the region, significantly increasing the scale of the existing environmental threat.

As you know, our country is rich in surface water resources. 70% of these resources come from transboundary water flows that enter our country from neighboring countries, and, unfortunately, most of these transboundary rivers also flow from Armenia to the territory of Azerbaijan. At this time, Armenia did not accede to international conventions. In particular, non-participation in the Helsinki Convention posed a threat to the ecology of our country. Currently, the Armenian government refuses to accede to these conventions. The proposals and requirements of the conventions continue to be grossly violated. However, despite the fact that the government signed the protocol of the Helsinki Convention on Water and Health in 1999, the law has not yet come into force. This protocol aims to protect public health and efficient use of water resources. The main reason that the law has not entered into force is that the principle of "the polluter must pay" reflected in the convention does not apply to the Armenian

government and is not accepted by the state. Because Armenia polluted Okchuchay itself. Iravan wants this principle of the convention to apply only within the country, and the states located downstream of the river, that is, Azerbaijan and Iran, do not consider it justified to demand any compensation and note that it should not be awarded. After liberation from occupation, physical and chemical purification of water contents is carried out in Okchuchay [4].

Basichay is also the left branch of the Araz River. The source of this river is in the Republic of Armenia. The total length of the river is 44 km, of which 17 km is in the territory of Azerbaijan. This river is also dirty, just like Okchuchay. The source of pollution is waste from pig farms in the mountain villages of Armenia.

Gargarchay originates in the Shusha region and is a river flowing from a height of about 2082 m. It mainly passes through large areas such as the Khojaly, Agdam, Agjabadi, and Khankendi regions. The Gargar River is the confluence of the Zarishli and Khalfali rivers. The residual elevation difference between the source and the outlet is 2082 m. The main tributaries are Ballyja, Badara, Dagdagan.

Chaylagchay is a left tributary of the Araz River and passes through the Jabrayil region. The length along the river is 32 m. It begins at an altitude of 1750 m in the southern foothills of the Lesser Caucasus. The river flows mainly with rainwater. Chaylagchay is widely used in irrigation. Therefore, its water does not reach the mouth.

Since Azerbaijan was deprived of water from Tartarchay, Gekarichay, Levchay, Tutkunchaya, Khachinchaya and other large rivers for many years, difficulties arose with irrigating our agricultural fields during the growing season and the need for drinking water. The Armenian Dashnaks carried out environmental terrorism and did not drain the water of these dirty rivers into the foothills.

In areas where rocks of the Karabakh volcanic plateau are common, underground water is abundant, and this water comes to the surface in the foothills and feeds rivers in the form of springs. If we look at the hydrochemical characteristics of these sources, their overall level of hardness is relatively low due to the degree of calcium bicarbonate, which is considered the highest quality water in the rivers of Azerbaijan. Also, mainly in the upper reaches of the river, the slope and water level are high, and the flow speed is very high, so these rivers are also rich in hydropower resources. Including them in irrigation systems in other regions of Azerbaijan, Sarsang, Sugovushan, Agdamkend, Khachinchay, etc. will create conditions for improving the process of ecological restoration of reservoirs.

Exploration scientists note that at that time, water from artesian wells dug in the foothills of Karabakh was widely used. The reason for this was that the rivers were blocked by the Armenians. The waters of artesian wells are very clean underground waters. Therefore, these waters can be used as drinking water in households. It is more advisable to water the crops with river water. Because the composition of river waters is very rich in minerals and organic compounds. Our geographers, who organized events in our territories liberated from occupation, drew attention and expressed confidence that the water resources in these areas will create a turning point in the development of our economy, increase irrigated lands, satisfy the need for water, increase and manage other water resources [9].

Consequences of damage to the reservoirs of Karabakh.

There are a total of 24 reservoirs in the Karabakh region. Of these, 3 reservoirs remain in emergency condition. Of these, 22 reservoirs are used for reclamation and fishing purposes. Reservoirs used for reclamation work are subject to the so-called "agricultural institution". The main task of this institution is the management of water systems, their use and policy

development. The remaining 2 tanks are used as energy sources. The reservoirs used for hydropower are managed by the so-called “economic-production institution” [5].

As you know, on October 3, President of the Republic of Azerbaijan Ilham Aliyev raised the flag of Azerbaijan in the village of Sugovushan in Terter region. On October 3, 2020, the village of Sugovushan was liberated from occupation. This is, of course, a very significant event. These were still the first days of the war. The liberation of Sugovushi, one of the strategic settlements, was a great success and an important matter. This was one of the first major victories in the war.

The liberation of the village of Sugovushan from occupation was of great importance from a strategic position. After all, the location of this settlement played an important role during the war. The fact that the village is under our country gave us an advantage in the steps we took in our future operations. The enemy knew that we would operate on this road. The village of Talysh and the village of Sugovushan were liberated from occupation on the same day - October 3, 2020.

Another significance of the liberation of the village of Sugovushan from occupation is that the Sugovushan reservoir is located in this village. This reservoir is of great strategic and economic importance. In 1976, on the initiative of our great leader Heydar Aliyev, the Sugovushan reservoir and the Sarsang reservoir were built. The main purpose of these two reservoirs is to provide water to areas located outside the administrative borders of the former Nagorno-Karabakh Autonomous Region, such as Terter, Barda, Aghdam, Goranboy and others.

During this invasion, the enemy committed environmental terrorism against our country, which could also be called water terrorism. A report and resolution on this issue were even adopted at one of the sessions presented at the Parliamentary Assembly of the Council of Europe. As a result, the Armenian state was blamed. It was a great success for us. However, Armenian hate organizations sought to pursue a policy of moral terror against the people who prepared this report. When our lands were still under occupation, the Armenians turned off the water in the summer and let it go to waste in the winter. During the summer season, our rural population and farmers ran out of water. During the winter season, they released water and caused dangerous natural disasters that caused floods. This once again proves that we are faced with an ugly enemy. They used every opportunity in their hands against our country and were busy causing more damage. As a result, with the liberation of the village of Sugovushan and the transfer of this reservoir under our control, these capabilities of the Armenian government were completely out of their hands. We currently dominate these areas [3].

In 2021, water was supplied to the Terter region and other nearby regions for the first time in 30 years using the Sugovushan reservoir. On that day, as a result of the liberation of our village from occupation, about 30 thousand hectares of rainfed or poorly irrigated land were irrigated. Immediately after the occupation, repair work is already underway on other watercourses.

Concrete steps have been taken to effectively use the water resources of the East Zangezur and Karabakh economic zones and regions included in our liberated territories, programs have been developed and are being implemented in a very strict regime. Work on it has been going on for a long time and all the maps for the implementation of these water sources have already been drawn up. In addition, we are currently faced with the task of building new reservoirs.

Earlier, during the Soviet period, two hydroelectric power stations were built next to this reservoir. This was proposed by the great leader Heydar Aliyev. The Armenians also destroyed these stations during the war. More than 30 hydroelectric power stations were destroyed in Kelbajar and Lachin regions. During the war and after the war, the Armenians were given time to leave these lands. They are currently being restored. Thus, work has begun on the restoration of hydroelectric power stations (HPPs) “Suguvushan-1” and “Suguvushan-2”. These stations are currently operational. Their foundations were restored and built. This once again proves the

strength and politics of our country. Our country has taken very serious steps regarding infrastructure work projects. In 2021, how many great things have already been done, not even a year has passed since the end of the war. The village of Sugovushan is of great importance for providing the territories I mentioned with electricity and water. Another important aspect of the liberation of this settlement is the further strengthening of our moral, that is, psychological advantage.

The Sarsang reservoir is a reservoir for energy purposes. The Sarsang reservoir has a capacity of 50 MW. Before the occupation, Sarsang and Sugovushan stations were under the jurisdiction of Artsakh SES CJSC. Up to 48% of the shares of a closed joint stock company here belong to the so-called institution, and the remaining approximately 52% of the shares belong to small private entrepreneurs. Our largest reservoir in terms of volume is Sarsang, which is the largest reservoir not only in the Karabakh region, but also in Armenia. It should also be noted that the capacity of the largest Akhuryan reservoir on Arpachay, which is shared by the government of Armenia and Turkey, is 525 million m³. The total capacity of the Sarsang reservoir, built in 1976 in the Terter region, is 565 million m³. However, the useful volume of this reservoir is 495 million m³, the height of the dam part of the reservoir is 126 m, and its length is 550 m. Considering these indicators, this reservoir is considered one of the highest dam reservoirs in the region due to the height of the dam. Through the discharge system from the Sarsang reservoir towards the Sarsang hydroelectric power station, 70 m³ of water per second can be released. This reservoir also has irrigation sluices. If necessary, 30 m³ of water per second can be released from the reservoir for reclamation work.

As I already mentioned, all other reservoirs, except Sarsang and Sugovushan, are irrigation. These are mainly rural lakes. However, the capacity of the Khach reservoir is 15 million m³. It also ranks first among the reservoirs located on the territory of Karabakh in terms of volume among the reservoirs included in its group. Although this warehouse was built back in Soviet times, it was located outside the territory of the former Nagorno-Karabakh Autonomous Region - on the Khachin River in the Agdam region. When it was under occupation, it came under the control of the so-called organization in Askeran and Agderin territories.

In addition to the Khachin reservoir, the Varanda-1 (Karadaghly) reservoir, which is located in the south of the Karabakh region near the Fizuli region, is also of great importance. However, the general condition of the Sarsang, Madagiz, Khachin reservoirs and the Varanda-1 reservoirs was sufficiently assessed as a result of the analysis. The head of the research project, Arestak Sarukhanyan, told reporters about this in February 2014. He also stated that the Khachinskoye and Madagizskoye (Suguvushanskoye) reservoirs are in a stable condition. According to him, the Suguvushan reservoir was not damaged during the April battles of 2016, and the condition of the Sarsang reservoir dam remained satisfactory.

The total volume of water in the Khachinsky reservoir is 22 million m³, and the volume of the Varanda-1 reservoir is 10-12 million m³. If we add the water capacity of the Sarsang and Sugovushan reservoirs to these figures, then 604 million m³ of water can be stored in the reservoirs of Karabakh.

It should also be noted that the technical designs of none of the reservoirs built during the Republic of Azerbaijan were preserved during the Karabakh War. For this reason, the technical designs of the Sugovushana, Khachin and Varanda reservoirs were revised. According to the information received, on the Varanda River there are 3 reservoirs "Varanda-1", "Varanda-2", "Varanda-3", all of them were built in Soviet times.

If we look at history, the construction of the Varanda-3 reservoir, which was completed in 1962, began to be reconstructed illegally in 2015. The total capacity of this warehouse was 3 million m³. Also, this reservoir, like two other reservoirs, was built in the Fizuli region outside the

DKMV region. There were many purposes for the construction of this reservoir. For example, it is planned to use this reservoir to irrigate arable fields in the Khojavend region.

During the years when Karabakh was under occupation, it was said that several important reservoirs would be built through investments from foreign states, and a few years ago about the construction of a reservoir with a capacity of 12 million m³ on the territory of Karabakh. Lachin district will be completed. It is said that there will be a big project in this area worth 100 million dollars at the expense of local and foreign countries. Then the Armenian government stated that these reservoirs that will be built will serve many purposes. In particular, the construction of reservoirs intended for tourism, energy and fishing was envisaged [7].

It was stated that the purpose of the reservoirs being built is not only to produce electricity, but also for irrigation and fishing. Taking all this into account, we come to the conclusion that when these areas were under the enemy's foothold, they caused huge economic damage to Azerbaijan along with environmental damage. It has surpassed our country in both energy resources and irrigation of agricultural fields.

In addition to these reservoirs, there are also the Giz Galasi and Khudafar reservoirs.

Maiden Tower Reservoir is a reservoir located between Iran and Azerbaijan. Located on the international border between the two countries, this reservoir was built on the Araz River. The distance between the Maiden Tower reservoir and the Khudafar hydroelectric complex is 12 km, and it is located in the Jabrayil region. This reservoir and the hydroelectric power station of the same name have been under the control of the Republic of Armenia since 1993, and on October 18, 2020 they were released from its control. The Maiden Tower Reservoir was built on the Araz River in accordance with the agreement signed between Iran and Azerbaijan. Providing water to approximately 12,000 hectares of land through this reservoir is among the planned activities.

The main purpose of the Gyz Galasy hydroelectric complex is the production of hydroelectric power and its use for irrigating agricultural fields. Back in October 1977, the project of this hydroelectric complex was developed on the basis of an agreement between the Soviet Union and Iran. Work on this project was completed in 1982 and was finalized and developed in the early 1990s. According to Armenian media reports, Iran signed the agreement in secret form. The purpose of this document was to complete the agreement with Armenia. Because this agreement did not give any advantage to Iran [7].

According to the order of the Cabinet of Ministers of the Republic of Azerbaijan, in 1992, he stated that the technical condition of this hydroelectric complex was not at all satisfactory, and for this reason, projects related to the improvement and development of the reservoir were worked out. went out and got ready. However, as a result of the 1st Karabakh conflict and the occupation of our lands by the Armenian armed forces, cooperation between Azerbaijan and Iran on the use of this reservoir was completely stopped. However, Iran and Armenia did not cooperate, and the construction and construction of the Giz Galasi hydroelectric complex and hydroelectric power station was carried out only by the Islamic Republic of Iran.

The topic of this hydroelectric complex was again put on the agenda by Heydar Aliyev, who returned to power in 1993. During Heydar Aliyev's visit to Iran from June 28 to July 2, 1994, memorandums and agreements on the implementation of the project were signed.

Finally, on October 18, 2020, this reservoir and the hydroelectric power station of the same name were destroyed by the victorious army of Azerbaijan and liberated from occupation by the army of the Republic of Armenia.

Iran has planned to allocate funds in the amount of 3.65 trillion rials, or about \$86.9 million, for the construction of the reservoir in question. Iran filled the reservoir with water on March 21, 2021. Concrete work is currently underway around the Maiden Tower Reservoir. work is

underway. Construction work on the reservoir is almost complete. Progress in all construction processes was 90%.

Also, the Khudafar reservoir, together with the Giz Galasi reservoir, is an important waterworks. It is planned to irrigate an area of 75,000 hectares. This was reflected in the information of the Turan agency dated July 2, 1994 about the construction of a large hydroelectric complex near the Khudafarinsky Bridge. An agreement was reached between the Azerbaijani delegation and the Ministry of Energy of the Iranian government. It is said that this hydroelectric project will consist of only four power plants. The volume of the hydroelectric complex is 1.6 billion m³ of water. The daily throughput capacity of the reservoir regulator is 60 million cubic meters. m³ of water. Subsequently, water from the Araz River is used in a volume of 1 billion m³, which is used through a reservoir in Nakhchivan. The funds allocated for the project amount to UAH 700 million. dollars. The period allotted for the project is eight years. According to calculations, the cost of the waterworks will be recouped within eight years. Full construction of the dam was completed in 2008. After 2 years, the hydroelectric power station on the reservoir was ready. Irrigation work is currently ongoing.

During the construction of the warehouse, several sites from the Bronze Age were discovered, including a grave belonging to a warrior of the Saka-Scythian tribe. During the construction of this warehouse, many negative situations were observed. Thus, in some villages of Dzhabrail and Zangili there was a flood. Thus, the highway between Baku and Zangilan was flooded.

During this time period, the construction of the Khudafarin hydroelectric dam has also been completed, and the final finishing work is underway on the Giz Galasy hydroelectric dam. The construction and operation of these two hydroelectric complexes and the hydroelectric power station are regulated by an agreement signed between the two countries in 2016. However, the entire state border with The Islamic Republic of Iran came under our complete control as a result of the liberation of the Jabrayil region from occupation in October 2020, which was a very important event in terms of the completion and operation of power plants at hydroelectric complexes. In general, such projects as free from occupation and will play a special and important role in supplying electricity to our liberated areas, and in the irrigation of these territories.

On January 18, 2022, in the Gyz Galasy reservoir, in order to discuss the progress and progress of the tasks assigned to the Joint Technical Commission to complete the construction of the Khudafarin and Gyz Galasy hydroelectric power stations and the hydroelectric power stations on them, the Commission will meet with both Azerbaijan and a meeting of members with Iranian side took place. At this meeting, discussions took place between the two countries regarding the continuation of the construction of hydroelectric power stations and hydroelectric power stations on Araz, their use, and the use of energy and water resources. At the same time, it was decided to take many steps to meet the need for electricity in the liberated territories, to accelerate the construction of the Khudafarin and Giz Galasy hydroelectric power stations, which are important for irrigating agricultural land and arable land.

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Автор: Qurbanova Fidan

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INCREASING RESEARCH AND DEVELOPMENT ACTIVITIES OF ENTERPRISES IN ORDER TO IMPROVE THEIR PRODUCTIVITY AND EFFICIENCY

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ABSTRACT

The intensification of competition between enterprises forces them to use all ways to improve their competitive advantages, to increase their efficiency and productivity. Innovation activity plays an important role in increasing the efficiency and productivity of the enterprise. The increasing innovation activities of enterprises depend on the expansion of activities in the field of research and development. By considering the research and development activities of enterprises around the world at the present time, we could say that there are different situations. Thus, in most developed countries, the share of the business sector in research and development expenses is higher (60-70%). However, in most developing countries, this amount is lower (10-30%). In 2021, the share of the government in research and development expenses in the Republic of Azerbaijan was approximately 82%, and the rest was provided by the higher education and business sectors. For this reason, it can be said that the low level of research and development expenses in the country is caused by the fact that enterprises do not pay due attention to this field. It is obvious from the conducted studies that there is a direct positive relationship between research and development activities and economic indicators of the enterprise. Thus, the expansion of research and development activities of enterprises leads to the improvement of their indicators such as productivity and profitability.

The purpose of the presented article is to identify ways to increase the research and development activities of enterprises. We assume that the strengthening of research and development activities in enterprises leads to an increase in their productivity, the amount of output and profits in general. For this purpose, econometric model was created to assess the relationship between the research and development expenses of the enterprises in Azerbaijan and their productivity.

KEYWORDS: research and development, efficiency, productivity, innovation, enterprise.

INTRODUCTION

Businesses today give more importance to research and development in order to increase productivity and profitability, create new products, and strengthen their competitive advantage. In such a case, research and development gradually replaced the importance of fixed assets and were considered the main factors of success in the field of business. It is accepted by most researchers that research and development expenditures play a key role in the expansion of enterprise activity (O'Mahony & Vecchi, 2009; Sharma, 2012; Kim et al., 2018; Koutroumpis, Leiponen, & Thomas, 2020). Thus, Missaka (2015), Joshenki and Sopova (2013), and Shih Yung et al. (2017) noted that increasing research and development expenditures will ensure high growth for the enterprise in the future.

Analyzing the successful experiences of businesses, it can be seen that research and development plays an important role in the growth of profits and the improvement of the

competitiveness of those firms. Griliches (1979) stated that research and development expenditures lead to an increase in the knowledge capacity of the enterprise, an increase in innovation capabilities, and, as a result, an increase in productivity. Both in developed countries and in most of the developing countries, it has been emphasized that there is a positive relationship in the studies conducted regarding the impact of research and development expenditures on the economic indicators of enterprises. Thus, Griliches (1991) studied the impact of R&D on the economic indicators of US enterprises, Griffith et al., (2006) studied the impact of R&D expenditures on a large European enterprise in British manufacturing enterprises, as well as Koutroumpis et al., (2020). However, there aren't many relevant studies on developing countries. The main purpose of the paper is the analysis of the current situation of research and development expenditures in Azerbaijan in general and the current situation of research and development expenditures of enterprises in Azerbaijan, as well as the econometric assessment of the impact of research and development expenditures on the economic indicators of enterprises operating in the manufacturing industry. At the same time, the paper provides relevant recommendations for expanding the research and development activities of businesses.

RESEARCH AND FINDING

Literature review

Based on the endogenous growth model, Romer (1986) stated that high levels of research and development expenditures have spillover effects on society in addition to increasing output. Grossman and Helpman (1994) called technological progress the driving force of economic growth in every country in the world. Grossman and Helpman emphasized that companies invest more in research and development to increase their profits if there is potential. Thus, as enterprises spend more resources on research and development, their innovation activities expand, and as a result, they achieve higher productivity and profits.

In the micro and macro level studies conducted in several countries of the world in the field of research and development and firm's output, it was stated that the main role of research and development expenditures in the creation of new products, the growth of output, the acquisition of high technology and the increase in productivity of enterprises (Griliches, 1990; O'Mahony & Vecchi, 2009; Seo, Kim, & Lee, 2018; Koutroumpis, Leiponen, & Thomas, 2020).

Griliches (1973) noted in the studies conducted on different fields of industry that research and development have a direct positive effect on that field and have a spillover effect on related sectors. As a result of the research conducted by other researchers, it was determined that the rate of return of research and development is approximately 20-30% (Hall, Mairesse, and Mohnen, 2010).

Previous research noted that research and development expenditures were often used to evaluate product and process innovations (Kotabe et al., 2002). If an enterprise has a high level of product design, that enterprise gains a competitive advantage and increases its sales. At the same time, process innovations reduce production costs and increase product quality. When innovations arise from research and development, they increase the efficiency of enterprises (Hitt et al., 1994).

Hayes and Abernathy (1980) noted that firms have an organizational commitment to compete technologically in order to succeed. Businesses must offer high quality products to be profitable in the long run.

Research and development plays an important role in establishing relationships with current and potential competitors of enterprises. The feature of research and development expenditures is that it creates a competitive advantage for enterprises. Research and development expenditures reduce competitors' ability to create similar products and cause firms to earn above-average profits (Erickson and Jacobson, 1992).

Research and development expenditures should be directed towards product innovation and technology enhancement to have a positive impact on enterprise performance. Loof and Heshmati (2002) believe that research and development expenditures have a positive effect on the performance of enterprises when they lead to tangible results such as patents. Lev and Zarowin (1999) as well as Lev and Sougiannis (1996) stated that R&D expenditures should be related to product and technological innovation in order to increase the output of enterprises. Some researchers, especially Donelson and Resutek, disagree with this idea. They believe that the increase in research and development expenditures does not have a positive effect on the profits of enterprises. From an investor's point of view, research and development expenditures are in fact an investment for the enterprise and can increase the enterprise's profits in the future. However, Cooper (2008) states that, contrary to this opinion, there is a positive correlation between research and development expenditures and the current profit of the enterprise. In addition, it was reflected in the research of Michael (2008) that there is a positive relationship between research and development expenditures and the future profitability of the enterprise. A study conducted by Bhagwat et al., (2001) on a study of US pharmaceutical companies from 1989 to 1998 concluded that a one percent increase in R&D expenditures increased profits by 0.25%.

Chao-Hung Wang (2011) noted that enterprises must work harder to survive in a fiercely competitive environment. For this reason, they should use their resources more efficiently. According to the resource-based view, enterprises that have resources that cannot be duplicated or replaced have an advantage over others. At the same time, research and development have an important role as a resource of the enterprise. The finances spent by the enterprise on research and development increase their internal innovation capabilities and strengthen their activities. At the same time, enterprises that spend more on research and development have more profits than others (Chao-Hung Wang, 2011).

It is obvious from the conducted studies that the coefficient of the impact of research and development expenditures on output in US enterprises is 0.07% (Griliches, 1991), 0.012-0.029% in UK manufacturing enterprises (Griffith, Harrison and Van Reenen, 2006), 0.072-0.155% in Germany. (Harhoff, 1998). Research conducted in four countries of the world (USA, Great Britain, Japan, and France) reported that companies that focus more on research and development have 2-5% more productivity (O'Mahony and Vecchi, 2009). In recent years, on the bases of the analysis of statistical figures covering the years 2004-2013 for large enterprises of some European countries (Germany, France, Sweden and Great Britain), it was determined that research and development expenditures have a more positive effect on enterprises in the information and communication technology sector.

Research conducted on the basis of indicators covering the years 1997-1998 in Chinese medium and large enterprises, it was determined that the increase in research and development expenditures has a positive effect on the profits of enterprises (Jefferson and Singh, 1998). At the same time, a study conducted by Sharma (2012) on the basis of statistics from 1994-2006 in Indian pharmaceutical manufacturing enterprises highlighted that R&D has a positive effect on Total Factor Productivity (TFP) and the firm's output. Thus, according to this study, research and development provides a 15-19% increase in TFP. In addition, the same author, in a study of Indian firms operating in the same manufacturing sector for the period 1994-2010, concluded that R&D had little impact on TFP and output, but had a higher impact on productivity.

In a study conducted by Rao, Yu and Cao (2013), it was noted that R&D expenditures have a positive effect on the performance of enterprises, but this effect weakens in the long run. Xu and Sim (2018) in their study of Chinese and South Korean enterprises, concluded that R&D has a positive effect on enterprise output. In addition, Kim et al. (2018) reported a non-linear relationship between R&D expenses and enterprise output in their study of 563 enterprises in

China, covering the years 2005-2013. In this study, it was noted that as research and development expenditures increase, the output of enterprises decreases.

From the mentioned studies, it is clear that increasing research and development costs mainly has a positive effect on the profit, output, and productivity of enterprises, and enterprises should pay more attention to this area and increase research and development expenditures in order to achieve success.

The current situation of research and development expenditures by enterprises in Azerbaijan

The development achieved in many sectors of the economy in recent years in our Republic has spread to other sectors as well, as a result of which great progress has been achieved in many sectors. If we look at the statistical figures, we can observe that research and development expenses are increasing in our country. However, considering the ratio of R&D expenditure to GDP, it appears to have remained unchanged at 0.2%. However, in most countries in the world, this number is 2–3%, and in some countries, it is even more than 4%. One of the main difficulties in this direction is the allocation of research and development expenditures in the country mainly to basic research (Table 1).

Table 1. Research and development expenditures in Azerbaijan (by percentage)

Years	Total	Basic research	Applied research	Experimental development
2011	100	51.1	33.9	15.0
2012	100	51.1	26.3	22.6
2015	100	51.4	19.9	28.7
2016	100	55.5	17.5	27.0
2017	100	53.8	18.8	27.4
2018	100	55.5	17.9	26.6
2019	100	53.7	24.1	22.2
2020	100	55.7	22.4	21.9
2021	100	56.4	20.4	23.2

Source: It was calculated by the authors based on the data of the State Statistics Committee of the Republic of Azerbaijan

It is clear from Table 1 that during the period 2011–2021, the main part of the research and development expenditures in our country were allocated to fundamental research, and the share of fundamental research in the volume is still increasing. Thus, in 2011, 51.1% of the research and development expenditures of Azerbaijan were allocated to fundamental research, and in 2021, this figure increased further and reached 56.4%. As a result, the share of applied research and experimental development has decreased. In order to clarify the problem in our country, let's compare it with CIS member countries (table 2).

Table 2. Research and development expenditure structure in some CIS member countries (by percentage)

	Total	Basic research	Applied research	Experimental development
Azerbaijan				
2020	100	55.7	22.4	21.9

2021	100	56.4	20.4	23.2
Belarus				
2020	100	14.3	31.3	54.4
2021	100	15.6	31.0	53.4
Kazakhstan				
2020	100	15.7	61.2	23.1
2021	100	18.3	62.4	19.3
Moldova				
2020	100	10.6	75.0	14.4
2021	100	8.9	77.5	13.6
Russian				
2020	100	18.8	19.9	61.3
2021	100	18.7	19.5	61.8
Uzbekistan				
2020	100	14.1	36.9	49
2021	100	16.3	21	62.7

Source: It was calculated by the authors based on the data of the State Statistics Committee of the Republic of Azerbaijan

It is clear from Table 2 that in 2020–2021, most of the research and development expenditures in Belarus, Moldova, Kazakhstan, Russia, and Uzbekistan were allocated to applied research and development, not fundamental research.

As is clear from the theories, the main reason for the problem with research and development in our country is that the total amount is provided mainly by the public sector, not by businesses (table 3).

Table 3. Internal expenditures on research and development in Azerbaijan by sectors (thousands of manats)

	2005	2010	2015	2019	2020	2021
Domestic expenditure on research and development:	29 042.2	92 778.2	120 943.6	163 890.4	162 452.5	194 197.3
Public sector	21 508.7	68 287.2	104 135.7	134 892.0	139 115.9	158 679.4
Business sector	5 749.1	17 982.8	6 470.5	6 094.8	5 478.4	5 729.3
Higher education sector	1 784.4	6 508.2	10 337.4	22 903.6	17 858.2	29 788.6

Source: State Statistics Committee of the Republic of Azerbaijan

According to the statistical data in Table 3, research and development expenditures in our country increased sharply from 2005 to 2021. Thus, in 2005, this figure was 29042.2 thousand manats, and in 2021, it increased more than six times and reached 194197.3 thousand manats. However, it is clear from the data in the table that the main part of this large increase was the result of the increased share of the public sector and the higher education sector. There is almost no change in the share of businesses. For this reason, it can be noted that it would be appropriate to implement relevant activities in order to increase research and development expenditures and

to involve the business sector more in research and development activities in order to make the research applied.

Econometric assessment of the impact of research and work costs on the economic indicators of enterprises operating in the processing industry in Azerbaijan

Necessary econometric evaluations were carried out in order to assess the impact of research and development expenditures on the economic indicators of enterprises in Azerbaijan.

Before the evaluations, the following hypotheses were presented:

H1: The R&D expenditures of the country have a positive effect on the output of manufacturing enterprises.

H2: R&D expenditures in the country have a positive effect on the added value of businesses in the manufacturing industry.

H3: The research and development expenditures of the country have a positive effect on the labor productivity of businesses in the manufacturing industry.

First, in order to evaluate the impact of research and development expenditures on the output of manufacturing enterprises, an appropriate model was formed, and the evaluation was carried out using the EViews Application Software Package. In this model dependent variable PROD_MANUF – the enterprise's output in the manufacturing sector and independent variables TRD - total research and development expenditures, LF_MANUF - the number of workers in the manufacturing industry and FA_MANUF - fixed assets in the manufacturing industry were taken (1).

$$\begin{aligned} \text{LOG}(\text{PROD_MANUF}) = & 2.73515759446 + 0.471183178968 * \text{LOG}(\text{TRD}) + \\ & 0.000394573810594 * \text{LF_MANUF}(-1) + 0.352036708578 * \text{LOG}(\text{FA_MANUF}) - \\ & 0.0908022997066 * \text{DUMMY2020} \end{aligned} \quad (1)$$

According to the result, research and development expenditures in the country have a positive effect on the output of enterprises in the manufacturing industry. Thus, if research and development expenditures increase by 1%, the output of enterprises in the manufacturing industry increases by 0.47% on average. The statistical characteristics of the model are given in the table below.

Table 4. Statistical characteristics of the model (1)

Dependent Variable: LOG(PROD_MANUF)

Method: Least Squares

Date: 01/11/24 Time: 12:25

Sample (adjusted): 2010 2021

Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.735158	0.596652	4.584178	0.0038
LOG(TRD)	0.471183	0.184217	2.557766	0.0430
LF_MANUF(-1)	0.000395	0.000135	2.930113	0.0263
LOG(FA_MANUF)	0.352037	0.140155	2.511763	0.0458
DUMMY2020	-0.090802	0.038932	-2.332302	0.0585
R-squared	0.993132	Mean dependent var		9.121361
Adjusted R-squared	0.988554	S.D. dependent var		0.288703
S.E. of regression	0.030887	Akaike info criterion		-3.814001
Sum squared resid	0.005724	Schwarz criterion		-3.633140
Log likelihood	25.97701	Hannan-Quinn criter.		-3.928009
F-statistic	216.9172	Durbin-Watson stat		1.724406

Prob(F-statistic)

0.000001

In order to evaluate the impact of research and development expenditures on the added value of enterprises in the manufacturing industry in the country, an appropriate model was established and the evaluation was carried out using the EViews Application Software Package, and the following result was obtained (2).

$$\text{LOG}(\text{VA_MANUF}) = 2.33951768437 + 0.506361554302 * \text{LOG}(\text{TRD}) + 0.00071064880532 * \text{LF_MANUF}(-1) + 0.174059131977 * \text{LOG}(\text{FA_MANUF}) \quad (2)$$

Table 5. Statistical characteristics of model (2)

Dependent Variable: LOG(VA_MANUF)

Method: Least Squares

Date: 01/10/24 Time: 20:59

Sample (adjusted): 2010 2021

Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.339518	0.316913	7.382207	0.0002
LOG(TRD)	0.506362	0.099220	5.103433	0.0014
LF_MANUF(-1)	0.000711	7.65E-05	9.284787	0.0000
LOG(FA_MANUF)	0.174059	0.071395	2.437958	0.0449
R-squared	0.997857	Mean dependent var		8.065395
Adjusted R-squared	0.996939	S.D. dependent var		0.319762
S.E. of regression	0.017691	Akaike info criterion		-4.956195
Sum squared resid	0.002191	Schwarz criterion		-4.811506
Log likelihood	31.25907	Hannan-Quinn criter.		-5.047401
F-statistic	1086.625	Durbin-Watson stat		2.524826
Prob(F-statistic)	0.000000			

Here, the dependent variable is VA_MANUF – added value of enterprises in the manufacturing industry, the independent variable is TRD – research and operation costs, LF_MANUF – the number of employees in the manufacturing industry, and FA_MANUF is the volume of fixed assets in the manufacturing industry. According to model (2), research and development expenditures have a positive effect on the volume of added value in the manufacturing industry. That is, if research and development expenditures increase by 1%, the volume of added value of businesses in the manufacturing industry increases by 0.5% on average.

In order to evaluate the impact of research and development expenditures on the labor productivity of enterprises in the manufacturing industry in Azerbaijan, an appropriate model was formed and the following result was obtained by conducting an evaluation using the EViews Application Software Package (3).

$$\text{LOG}(\text{VA_MANUF}/\text{LF_MANUF}) = -5.4423685396 + 0.573293682744 * \text{LOG}(\text{TRD}) + 0.325481617483 * \text{LOG}(\text{FA_MANUF}) \quad (3)$$

Here VA_MANUF/LF_MANUF – labor productivity is on added value in the manufacturing industry as a dependent variable, TRD - and research and development expenditures and FA_MANUF - the volume of fixed assets in the manufacturing industry as an independent variable. According to the result, there is a positive relationship and if research and development expenditures increase by 1%, labor productivity increases by 0.57% on average. The statistical characteristics of the model (3) are given in the table below.

Table 6. Statistical characteristics of model (3)

Dependent Variable: LOG(VA_MANUF/LF_MANUF)

Method: Least Squares

Date: 01/11/24 Time: 14:46

Sample (adjusted): 2005 2021

Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.442369	0.564996	-9.632572	0.0000
LOG(TRD)	0.573294	0.085722	6.687787	0.0001
LOG(FA_MANUF)	0.325482	0.100896	3.225923	0.0104
R-squared	0.979890	Mean dependent var		0.178392
Adjusted R-squared	0.975421	S.D. dependent var		0.403091
S.E. of regression	0.063196	Akaike info criterion		-2.472845
Sum squared resid	0.035943	Schwarz criterion		-2.351618
Log likelihood	17.83707	Hannan-Quinn criter.		-2.517728
F-statistic	219.2662	Durbin-Watson stat		1.891216
Prob(F-statistic)	0.000000			

It should be noted that appropriate tests were performed to verify the adequacy of all three models, and based on the results of those tests, all three models are adequate.

CONCLUSION

As mentioned, research and development expenditures play an important role in improving the economic performance of enterprises. As a result of our research, it has been determined that a lot of studies have been conducted in developed countries and developing countries regarding the impact of research and development expenditures on the output, productivity, and profitability of enterprises, and almost all of them have emphasized the positive relationship. Analyzing the current situation of research and development expenditures in our country, we see that they are at a relatively low level. So, although in most countries in the world, research and development expenditures make up 2–3% of GDP and even more than 4%, in our country, this figure is 0.25%. La principale raison pour cela est que les entreprises dépensent très peu de fonds en recherche et développement. Thus, in most countries, the share of enterprises in research and development expenditures is between 70 and 80%, but this indicator is very low in our country.

Three hypotheses were presented in our econometric evaluation of Azerbaijan regarding the effect of research and development expenses on the economic indicators of enterprises: research and development expenditures have a positive effect on the output of enterprises; research and development expenditures have a positive effect on the added value of enterprises, and research and development expenditures have a positive effect on the labor productivity of enterprises. As a result of the econometric evaluations, all three hypotheses were accepted.

In order to increase the research and development expenditures of enterprises in our republic, we suggest the following recommendations:

- Expansion of relations between enterprises and universities in the country. In most countries of the world, special attention is paid to these relations, and in recent years, this field has gained priority in our country. In this regard, in order to encourage both organizations, the introduction of tax incentives, the creation of a joint website, and the formation of a relevant department in both organizations can stimulate the development of relations between universities and enterprises.

- In order to expand the research and development activities of enterprises, it is necessary to initially apply relevant tax incentives, provide subsidies and implement other supporting measures.

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VARIOUS CATALYSTS FOR GREEN SYNTHESIS OF PYRANOPYRAZOLES

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<https://orcid.org/0000-0003-4838-1503>**ABSTRACT**

In recent years, the heightened interest in pyranopyrazole compounds, driven by their biological and pharmacological activities, has become a prominent trend among synthetic organic chemists. Scientific studies, for instance, have demonstrated the analgesic, anti-inflammatory, diabetic, and vasodilator effects of pyranopyrazole derivatives. Additionally, multicomponent reactions (MCRs) are increasingly employed in the synthesis of pyranopyrazole derivatives. MCRs have gained favor among synthetic chemists due to their economic efficiency, rapidity, energy efficiency, and simplicity in experimental procedures. These reactions facilitate the conversion of numerous compounds into their products in a single reaction, yielding fewer by-products compared to conventional multi-step reactions. This attribute makes MCRs more atom-economical, selective, and aligns with the principles of green chemistry. The role of heterocyclic compounds in multicomponent reaction protocols is of significant interest in organic chemistry. Furthermore, the design of organic reactions in aqueous media stands out as a crucial topic in the realm of environmentally friendly chemistry.

The catalyst enhances the efficiency of reactant conversion and facilitates the formation of desired products. Thanks to the catalyst, the reaction can be conducted under room conditions, saving energy and providing a more environmentally sustainable process. To achieve this, an efficient protocol was developed for the one-step synthesis of pyranopyrazole under room conditions in a solvent, primarily water, containing hydrazine hydrate, ethyl acetoacetate, aldehyde, malononitrile, and various catalytic amounts of imidazole, urea, zinc oxide, glycine, sodium carbonate, calcium carbonate, magnesium oxide, sucrose, ethyl amine, and piperidine. The yields of pyranopyrazole products, resulting from the catalyst used in each reaction, ranged from 98% to 6%. The catalysts employed in this reaction play a crucial role in accelerating the reaction rate and enhancing product yield. The developed protocol presents an efficient approach for pyranopyrazole synthesis through a one-step reaction with hydrazine hydrate, ethyl acetoacetate, aldehyde, malononitrile, and various catalysts used in varying catalytic amounts, primarily in water under room conditions. This protocol has demonstrated success in obtaining desired products with high yields, underscoring the efficiency and applicability of the process.

KEYWORDS: Aldehyde, Malonitrile, Four-Component Reaction, Green Chemistry, Vitamin.

PIRANOPİRAZOLLERİN YEŞİL SENTEZİ İÇİN ÇEŞİTLİ KATALİZÖRLER

ÖZET

Son yıllarda, biyolojik ve farmakolojik aktiviteleri nedeniyle piranopirazol grubu bileşiklere olan artan ilgi, sentetik organik kimyacılar arasında belirgin bir trend oluşturmıştır. Örneğin, piranopirazol türevlerinin analjezik, anti-enflamatuar, diyabetik ve vazodilatör etkilere sahip olduğu bilimsel çalışmalarla gösterilmiştir. Ayrıca, çok bileşenli reaksiyonlar (MCR'ler), piranopirazol türevlerinin sentezinde giderek daha fazla kullanılmaktadır. MCR'ler, ekonomik, hızlı, enerji verimli ve basit deneysel prosedürler içeren reaksiyonlar oldukları için sentetik kimyacılar için çekici hale gelmiştir. Bu reaksiyonlar, birçok bileşiği tek bir tepkimede ürünlerine dönüştürerek klasik çok adımlı reaksiyonlara göre daha az yan ürün oluşturur. Bu durum, MCR'leri daha atom ekonomik ve seçici kılar ve ekonomik açıdan yeşil kimya ilkelerine uyarlar. Heterosiklik bileşiklerin çok bileşenli reaksiyon protokollerindeki rolü organik kimyada büyük bir ilgi çekmektedir. Ayrıca, sulu ortamda organik reaksiyonların tasarımı da çevre dostu kimya alanında önemli bir konudur.

Katalizör, reaktanların daha etkili bir şekilde dönüştürülmesini sağlar ve istenilen ürünlerin oluşumunu kolaylaştırır. Katalizör sayesinde tepkime oda koşullarında gerçekleştirilebilir, bu da enerji tasarrufu sağlar ve çevresel açıdan daha sürdürülebilir bir süreç sunar. Bu amaçla, hidrazin hidrat, etilasetoasetat, aldehit, malononitril ve çeşitli katalitik miktarlarda imidazol, üre, çinko oksit, glisin, sodyum karbonat, kalsiyum karbonat, magnezyum oksit, sukroz, etil amin ve piperidin içeren çoğunlukla su olan bir çözücü içinde, oda koşullarında, tek basamakta piranopirazol sentezi için etkili bir protokol geliştirilmiştir. Her reaksiyon için kullanılan katalizör sonucunda piranopirazol ürünlerin verimleri %98 ile %6 arasında değişmektedir. Bu reaksiyonda kullanılan katalizörler, tepkimenin hızını artırarak ve ürün verimliliğini iyileştirerek önemli bir rol oynamaktadır. Geliştirilen bu protokol, hidrazin hidrat, etilasetoasetat, aldehit, malononitril ve çeşitli katalitik miktarlarda kullanılan çeşitli katalizörlerle, oda koşullarında çoğunlukla su içinde gerçekleştirilen tek basamaklı bir reaksiyonla piranopirazol sentezi için etkili bir yaklaşım sunmaktadır. Bu protokol, yüksek verimlerle istenilen ürünleri elde etmede başarılı olmuştur, bu da sürecin etkinliğini ve uygulanabilirliğini vurgular.

ANAHTAR KELİMELEER: Aldehit, Malonitril, Dört Bileşenli Reaksiyon, Yeşil Kimya, Vitamin.

GİRİŞ

Günümüzde, organik bileşiklerin etkili bir şekilde sentezlenmesi, çevresel etkilerin en aza indirilmesi ve sürdürülebilir kimya prensiplerine uygunluğu sağlayan yeşil sentez stratejileri büyük önem kazanmıştır. Bu bağlamda, piranopirazol türevleri gibi biyoaktif bileşenlerin sentezi, hem ilaç endüstrisinde hem de malzeme biliminde geniş bir uygulama potansiyeline sahiptir. Bu makalenin odak noktası, piranopirazol türevlerinin çeşitli yeşil sentez yöntemleriyle elde edilmesi ve bu süreçte kullanılan çeşitli katalizörlerin etkinliğinin değerlendirilmesidir. Bu çalışmada, bildirinin amacı, yeşil kimyanın prensiplerini benimseyen sentetik yöntemlerin kullanımıyla piranopirazol sentezi alanındaki verimliliğini ortaya çıkarmaktır. Çeşitli katalizörlerin etkisi, reaksiyon koşulları ve ürün verimliliği üzerindeki etkileri ele alınarak, bu alandaki potansiyel ilerlemelerin anlaşılmasına katkıda bulunulması amaçlanmaktadır.

Kimya ve kimya mühendisliği disiplinleri, ham maddelerin değerli ürünlere dönüştürülmesinde, genellikle çoklu reaksiyonların kompleks etkileşimini içeren kritik bir role sahiptir. Bu reaksiyonlar, farmasötik üretimden petrokimya rafinerilerine kadar bir dizi endüstriyel sürecin temelini oluşturur. Bu süreçler, hayati öneme sahip ilaçların üretiminden, modern malzemelerin geliştirilmesine kadar geniş bir yelpazede kullanılmaktadır. Tekil reaksiyonların yönetilmesi zor olabilir, ancak gerçek entrikalar ve zorluklar, tek bir süreçte bir dizi reaksiyonun başarıyla yönetilmesi ve optimize edilmesinde yatar (Rotstein vd., 2014). Bu reaksiyonlar, karmaşık kinetikler, yan reaksiyonlar ve sıcaklık, basınç ve katalizör gibi değişkenlere bağımlılıklar gösterebilir. Çoklu reaksiyonların intricacies'ini anlamak, sadece endüstriyel süreçlerin etkinliği ve güvenliği için değil, aynı zamanda kimya endüstrisinde yenilik ve sürdürülebilirlik için de kritiktir (Domling vd., 2012).

Yeşil sentez, son on yılda kimya alanında önemli bir araştırma alanı olarak ortaya çıkan sürdürülebilir veya çevreye duyarlı bir sentez metodolojisi olarak öne çıkmaktadır (Iravani, 2011; Jadoun vd., 2021). Bu yaklaşım, çevresel etkileri en aza indirerek yüksek kaliteli kimyasal bileşikler üretmeyi, tehlikeli atıkları azaltmayı ve enerji tasarrufunu hedeflemektedir. Tehlikeli maddelerin azaltılması, atık oluşumunun minimize edilmesi ve enerji tüketiminin düşürülmesi, yeşil sentezin ana stratejilerindendir. Kataliz, çözücüsüz sentez ve yenilenebilir hammaddelerin kullanımı gibi stratejiler, yeşil sentezde yaygın olarak benimsenen yöntemlerdir (Katariya vd., 2023; Mohamadpour, 2023). Bu yaklaşım, ürün verimini ve seçiciliğini artırmak için reaksiyon koşullarını optimize etmeyi amaçlamakta ve güvenli, toksik olmayan, kolayca parçalanabilen kimyasalların ve çözücülerin kullanımını teşvik ederek kimyasal üretimle ilişkili riskleri azaltmaktadır. Ayrıca, yeşil sentez, çevresel etkilerini azaltarak nanoparçacıkların üretimi gibi alanlarda da önemli bir rol oynamaktadır. Bu, çevre dostu katalizörlerin geliştirilmesi ve atıkların azaltılmasıyla birlikte, tıp ve malzeme biliminde potansiyel uygulamaların artmasına katkıda bulunmaktadır. Yeşil sentez, enerji tüketimini azaltma amacıyla güneş ve mikrodalga ışıınımı gibi yenilenebilir enerji kaynaklarının kullanılmasıyla da dikkat çekmektedir. Bu bağlamda, biyolojik olarak parçalanabilen polimerlerin üretimi ve geleneksel plastiklere çevre dostu alternatifler sunma potansiyeli de vurgulanmaktadır (Jiang vd., 2023). Sürdürülebilir kimyasal yenilik için umut vadeden bir alan olan yeşil sentez, çevresel sorumluluk, kaynak verimliliği ve güvenlik ilkeleriyle uyumlu bir şekilde kimya endüstrisinin çevresel etkisini azaltma çabalarını desteklemektedir.

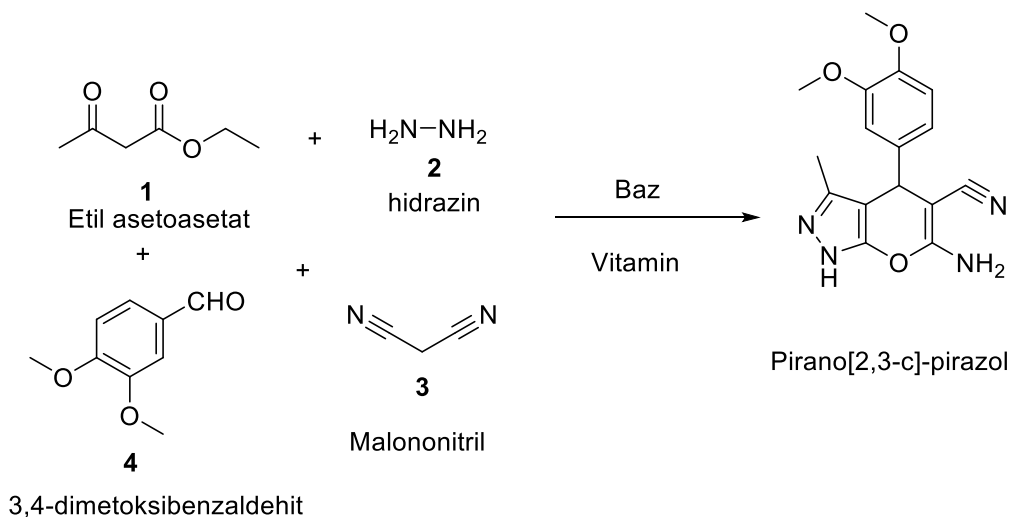
Çok bileşenli reaksiyonlar, piranopirazollerin sentezindeki popülerliğini etkinliklerinden dolayı kazanmıştır. Özellikle, aldehit, β -ketoester ve üre veya tiyoürenin Biginelli reaksiyonu ile birleştirilmesi gibi Biginelli reaksiyonu, piranopirazol sentezi için yaygın olarak benimsenmiştir (Reddy ve Raul Garcia, 2017; Mamaghani ve Hossein Nia, 2021). Piranopirazol sentezi alanında sürdürülebilir ve çevre dostu kimya yaklaşımları giderek daha fazla önem kazanmaktadır. Araştırmacılar, özellikle solvent içermeyen veya su bazlı metodolojilere odaklanarak çevre dostu reaksiyonlara yönelmektedirler. Enzim katalizli reaksiyonlar, özellikle kemo ve bölgesel seçicilik açısından piranopirazol sentezi için alternatif bir yaklaşım olarak aktif bir şekilde araştırılmaktadır. Huisgen 1,3-dipolar siklo katılması gibi tıklama reaksiyonları, piranopirazol sentezi için kullanılan ve karmaşık moleküllerin verimli bir şekilde oluşmasını sağlayan başka bir strateji olarak dikkat çekmektedir (Reddy vd., 2019). Araştırmacılar, piranopirazollerini işlevselleştirmek ve türetmek için sürekli olarak yeni yöntemler geliştirmekte ve bu sayede özel özelliklere ve aktivitelere sahip moleküllerin tasarımına olanak tanımaktadırlar.

YÖNTEM

Aldehit, malononitril, etil asetoasetat, hidrazin hidrat, katalizör olarak kullanılan çeşitli bazlar ve sulu vitamin çözeltisi olan maddeler, daha fazla saflaştırılmadan kullanıldı (Ganta vd., 2021). Tüm reaksiyonlar oda sıcaklığında çözücü olarak su-vitamin karışımında gerçekleştirildi. Verimler, ürünlerin izole edilmiş verimlerini ifade eder. Erime noktaları bir Gallenkamp marka erime noktası tayin cihazı kullanılarak belirlenmiştir.

BULGULAR VE TARTIŞMA

Pirano[2,3-c]pirazol bileşikler son yıllarda sentetik organik kimyacıların büyük ilgisini çekmektedir. Bu bileşiklerin biyolojik ve farmakolojik aktivitelerinden dolayı bu ilgi giderek artmaktadır. Literatürde pirano[2,3-c]pirazol türevlerinin analjezik, antiinflamatuvar, diyabetik ve vazodilatör etkiler gösterdiği gözlemlenmiştir (Myrboh vd., 2013). Bu nedenle pirano[2,3-c]pirazol bileşiklerinin sentezi ve kullanımı birçok terapötik alanda büyük potansiyele sahiptir. Pirano[2,3-c]pirazol bileşiklerinin sentezi için özellikle dikkat çeken bir yöntem, MCR'lerin kullanılmasıdır. MCR'ler, iki veya daha fazla başlangıç malzemesinin tek bir reaksiyon kabında kombinasyonunu içeren reaksiyonlardır. MCR'ler neredeyse tüm başlangıç malzemelerinin ürüne dönüştürülmesinden dolayı çok az yan ürün üretir. Hızlı reaksiyonlar olduğundan enerji tüketimini azaltırlar. Farklı başlangıç malzemelerinin kullanılabilmesi, çeşitli ürünlerin sentezlenmesine olanak sağlar (Sikandar ve Zahoor, 2021). Pirano[2,3-c]pirazol bileşikler biyolojik ve farmakolojik aktiviteleri olan ve çeşitli terapötik uygulamalara sahip önemli bir kimyasal sınıftır. Bu bileşiklerin ekonomik ve çevre dostu yöntemlerle sentezi, sentetik organik kimyagerlerin büyük ilgisini çekmektedir ve yeni ilaç ve materyallerin geliştirilmesinde potansiyel sunmaktadır (Mandha vd., 2012). Gelecekte, daha fazla araştırma ve yeniliğin pirano[2,3-c]pirazol bileşiklerinin daha geniş kullanımlarına yol açabileceği umulmaktadır. Literatürde piranopirazollerin sentezinde çok çeşitli katalizörler kullanılmaktadır. Şekil 1 de görüldüğü gibi, başlangıçta, ikame edilmiş benzaldehit, malononitril, etil asetoasetat ve hidrazin hidratın oda sıcaklığında sulu vitamin içinde herhangi bir katalizör olmadan model reaksiyonunu gerçekleştirmek için girişimlerde bulunuldu ve 9 dakika sonra %62 verimle katı ürün oluşumu gözlemlendi.



Şekil 1. piranopirazol sentezinde kullanılan bazlar

Reaksiyon karışımı ince tabaka kromatografisi (TLC) ile takip edildi. Bu şekilde reaksiyonun tamamen bitip bitmediği yani ürün oluşumu kolay bir şekilde gözlenmiştir. Tablo 1 de gösterildiği gibi çeşitli katalizörler kullanıldığında reaksiyonun gerçekleşip gerçekleşmediği ve oluşan ürünün verimin nasıl değiştiği detaylı araştırılmıştır. Bu amaçla, hidrazin hidrat, etilasetoasetat, ikame edilmiş aldehit, malononitril ve çeşitli katalitik miktarlarda imidazol, üre, çinko oksit, glisin, sodyum karbonat, kalsiyum karbonat, magnezyum oksit, sakkaroz, etil amin ve piperidin içeren çoğunlukla su olan bir çözücü içinde, oda koşullarında, tek basamakta piranopirazol sentezi için etkili bir protokol geliştirilmiştir. Önerilen yeşil sentez reaksiyonun sulu vitamin ile birlikte çeşitli katalizörler kullanıldığında oda koşullarında ortalama 10 dakika süreyle reaksiyon oluşumu ve ürün veriminde de genelde artış olduğu fark edildi. Her reaksiyon için kullanılan katalizör sonucunda piranopirazol ürünlerin verimleri %98 ile %6 arasında değişmektedir.

Tablo 1. Piranopirazol sentezinde kullanılan katalizörler

No	Baz	Zaman (dk)	Verim (%)
1	İmidazol	10	98
2	Üre	10	98
3	Çinko oksit	10	98
4	Glisin	10	98
5	Sodyum karbonat	10	98
6	Magnezyumoksit	10	49
7	Sakkaroz	10	9
8	Kalsiyum karbonat	10	6
9	Etil amin	10	87
10	Piperidin	10	38

SONUÇ

Günümüzde bilim ve teknoloji alanında yaşanan hızlı gelişmelere bağlı olarak yeni katalizör arayışları ön plana çıkmış, bu doğrultuda sürdürülebilir reaksiyonlar ve çevre dostu katalizörlerin geliştirilmesine yönelik bilimsel çalışmalar her zamankinden daha fazla dikkat çekmeye başlamıştır. Buna bağlı olarak da bu alanda hazırlanan bilimsel çalışmaların önemi ve sayısı ciddi boyutta artmıştır. Yeşil sentez ve çevreci reaksiyonlar günümüzde de popüleritesini koruyan önemli bir çalışma konusudur. Bu bildiride on tane çeşitli katalizörlerin pirano[2,3-c]pirazol sentezinde etkileri araştırılmıştır. Katalizör kullanıldığında en iyi verim sonucunun imidazol, üre, çinko oksit, glisin ve sodyum karbonat olduğu en düşük veriminde kalsiyum karbonat kullanıldığında olduğu gözlenmiştir. Konunun önemine binaen sunulan bildiri çevreci olma potansiyeline sahip birden fazla katalizörlerin özelliklerinin belirlenmesi ve bu katalizörlerin yeni (yeşil) bir sentez yönteminin geliştirilmesinde kullanılabileceğini ortaya koymuştur.

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THE POLITICAL CONTEXT OF ÂŞIK MAHZUNÎ ŞERİF: TURKEY IN THE 1970S

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ABSTRACT

Âşık Mahzunî Şerif is an important poet who contributed to the building process of Turkish Folk Literature tradition with his poems. The poet, who was born in the Berçenek village of Kahramanmaraş's Afşin district, started recording records in the 1960s. Thus, by adding his political identity to his poetic career, he became the subject of discussion, criticism and agenda in Turkish politics. In 1968, when the worker, laborer and student movements gained momentum in the world and in Turkey, Âşık Mahzunî Şerif also created his political context with his poems and folk songs. The 1961 constitution, which emerged after the military coup that took place on May 27, 1960, affected many political issues within Turkey. In this case, building a polyphonic environment provides workers, laborers and students with the opportunity to organize politically and ideologically. In this study, Âşık Mahzunî Şerif's participation in political struggle and organizational forms in Turkey in the 1970s. Mahzunî Şerif used music as an ideological device by including the social, political, economic and cultural crisis moments of the period in his poems. The study will first focus on Mahzunî Şerif's life, his place and discourse in Turkish Folk Literature. Secondly, on which problems did the political and social crises experienced in Turkey in the 1970s focus. Finally, with what contexts Mahzunî Şerif used these problematics in his poems and folk songs.

KEYWORDS: Âşık Mahzunî Şerif, Turkish Political Life, 1970s.

ÂŞIK MAHZUNÎ ŞERİF'İN POLİTİK BAĞLAMİ: 1970'LER TÜRKİYE'Sİ

ÖZET

Âşık Mahzunî Şerif, Türk Halk edebiyatı geleneğinin inşa edilme sürecine şiirleriyle katkı sunmuş olan önemli bir ozandır. Kahramanmaraş'ın Afşin ilçesinin Berçenek köyünde dünyaya gelen ozan, 1960'lı yıllarda başlamış olduğu plak çalışmalarına, Türkiye'deki gelir ve refah seviyesi düşük olan halkın sorunlarını da ekleyerek dizelerine dökmüştür. Böylelikle ozanlığının yanına, siyasal kimliğini de eklemleyerek, Türkiye politikasında tartışılan, eleştirilen ve gündeme gelen bir isim olmuştur. 1968 senesinde dünyada ve Türkiye'de işçi, emekçi ve öğrenci hareketlerinin ivme kazandığı evrede, Âşık Mahzunî Şerif de şiirleri ve türkülerıyla politik bağlamını oluşturmıştır. 27 Mayıs 1960 yılında gerçekleşen askeri darbe sonrasında ortaya çıkan 1961 anayasası, Türkiye içerisinde birçok siyasal partinin kurulmasına, sendikal örgütlenmelerin artmasına ve sivil toplum kuruluşlarının oluşmasını sağlamıştır. Bu durumda çok sesli bir ortamın inşa edilmesi işçi, emekçi ve öğrencilerin de siyasal ve ideolojik bir örgütlenme fırsatı yakalamaları sağlanmıştır. Bu çalışma içerisinde, Âşık Mahzunî Şerif'in 1970'li yıllar Türkiye'sindeki siyasal mücadele ve örgütlenme biçimlerine katılım süreci ele alınacaktır. Mahzunî Şerif dönemin toplumsal, siyasal, ekonomik ve kültürel kriz anlarını şiirlerinde yer vererek, müziği bir ideolojik aygıt olarak kullanarak kitleleri bu sorunsallar üzerinde düşünmeye ve tartışmaya çağırmıştır. Çalışmada ilk olarak Mahzunî Şerif'in yaşamı,

Türk Halk edebiyatındaki yeri ve söylemi üzerinde durulacaktır. İkinci olarak, 1970’ler Türkiye’inde yaşanılmış olan siyasal ve toplumsal krizlerin hangi sorunsallar üzerinde yoğunlaşmış olduğu hakkında bilgi verilecektir. Son olaraksa, Mahzunî Şerif’in bu sorunsalları hangi bağlamsallıklarla şiirlerinde ve türkülerinde kullanmış olduğu tartışılacaktır.

ANAHTAR KELİMELEER: Âşık Mahzunî Şerif, Türk Siyasal Hayatı, 1970’ler.

CONSTRUCTION OF COLLECTIVE MEMORY THROUGH OFFICIAL HISTORY EDUCATION IN CYPRUS

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ABSTRACT

Fundamental to recalling memories and remembering is to look at the past and the future concurrently. Remembering is crucial to have a temporal association so that present changes and developments can be elaborated in understanding the construction of memory (Six-Hohenbalken, 2018). Historical trauma is a psychological and emotional collective and subjective injury which are transmitted from adults to children in a cycle process, and it continues over a life span of individuals and across generations (Atkinson, et al., 2010). States have their version of narrations of history and remembrance, which shape society's collective memory through hard memories such as monuments, state laws, court decisions and memorial sites (Gang, 2020). This state version of history is taught both in the formal education system and through state narratives and symbols surrounding society members during their daily lives. Soft memories are created and shared as a social process. These are narratives, historical texts and similar, less tangible forms of memory. History education has a profound influence on social discourse and the way soft memories are perceived (Korostelina 2008), and since formal schooling is at the centre of shaping a generation and textbooks are the main medium of knowledge transmission, collective memory is shaped by the official narrative and often presented selectively (Boon & Gopinathan, 2005). This research aims to explore how the official government narratives of history may change over the years based on political rhetoric so that we can understand how political regulation of history education is used to align official state discourse with social memory across time. Through document analysis, this research investigates the political narrative of the state history textbooks for compulsory education, official politics of history education outside the school, individual narratives and semiotics in relation to the political milestones over the years within the context of Turkish Cypriots.

KEYWORDS: History Education, Historical Trauma, Collective Memory, Cyprus.

ANALYSIS OF LEB DEĞMEZ'S ART IN A SEMANTIC CONTEXT IN GAGAUZ POETRY PLANE

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ABSTRACT

In the study, reference is made to the art of leb değmez, which synchronizes the latitude of creation reflected from the rhetorical universe with an extreme frequency. In order to create an enthusiastic ceremony on the axis of meaning, the grammatical artistic emphasis of the poetic referent, which is voiced extemporaneously and is based on the principle of not passing the labial consonants (b, f, m, p, v) through the atmosphere of discourse, is presented to attention. The range of meanings of this descriptive pattern, which is also depicted as "unworthy of lips", has semanticized the poet's struggle with poetry in an improvisational style. It has been seen that leb degmez, which symbolizes the expression of literary skill in sound games, enriches literary creations.

It has been determined that this proposition, which depicts lip consonants that cannot cross the verse limit, strengthens the rhythm of discourse by capturing the latent harmony between the utterances reflected from the Gagauz literature. It has been revealed that the melodic units, patterned with the musical emphasis of the art of worthlessness, have been transferred to an artistic direction. Based on this emotional pattern, the metaphorical systems designed in the depiction table were transformed into an original imagination through a combination of sound.

The study employed the method of interpretive analysis by symbolizing the hidden harmony of the aesthetic elements constructed in the context of the text. The poetic layer motif in Gagauz literature was examined in the semantic scheme of the leb degmez plane, and the reactive process was initiated by considering the document analysis factor. The data potential of the theoretical elements for the research design was analyzed with a semantic projection. It has been noted that this imaginative connotation, which activates the aesthetic emphasis of the linguistic reaction with lyrical symbols, adds a harmonic pleasure to the Gagauz literary horizon. Therefore, the artistic perspective in question, which depicts dream vectors with a sensual design, has strengthened the imaginary structures in Gagauz literature and added a unique color and harmony to the meaning spectrum.

KEYWORDS: Gagauz poetry, Leb degmez art, Semantics, Rhetoric, Analysis.

GAGAUZ ŞİİR DÜZLEMİNDE LEB DEĞMEZ SANATININ SEMANTİK BAĞLAMDA ANALİZİ

ÖZET

Çalışmada retorik evrenden yansıyan yaratı enlemini ekstrem bir frekansla senkronize eden leb değmez sanatına gönderme yapılmıştır. Anlam ekseninde coşkun bir seremoni yaratmak adına, dudak ünsüzleri (b,f,m,p,v) ni söylem atmosferinden geçirmeme esasına dayanan ve irticalen sesletilen şiirsel göndergenin gramatikal boyuttaki sanatsal vurgusu dikkate sunulmuştur.

“Dudak değmez” olarak da resmedilen bu tasviri örgenin anlam yelpazesi, şairin şiirle olan mücadelesini doğaç bir üslupla semantize etmiştir. Ses oyunlarına dair yazınsal hünerin dışa vurumunu simgeleyen leb değmez, edebi kreasyonu zenginleştirdiği görülmüştür.

Manzum sınırı geçemeyen dudak ünsüzlerini tasvirleyen bu belîğ önermenin, Gagauz yazınından akseden sözceler arasındaki gizil ahengi yakalayarak söylem ritmini güçlendirdiği tespit edilmiştir. Leb değmez sanatının müzikal vurgusuyla desenlenen ezgisel birimlerin, sanatsal bir doğrultuya transfer edildiği belirmiştir. Bu duygusal örüntüden hareketle, betim tablosunda tasarlanan metaforik dizgelerin, ses kombinasyonu vasıtasıyla orijinal bir imgeleme dönüşümü gerçekleşmiştir.

Çalışma, metin bağlamında inşa edilen estetik öğelerin saklı uyumunu sembolize ederek yorumsal analiz metodunu işe koşturmuştur. Gagauz yazınında motiflenen şiirsel katman, leb değmez düzleminin anlam şemasında irdelenmiş, doküman analizi faktörü esas kılınmak suretiyle reaktif süreç başlatılmıştır. Araştırma desenine yönelik teorik unsurların veri potansiyeli semantik bir iz düşünle analiz edilmiştir. Dilsel reaksiyonun estetik vurgusunu lirik sembollerle aktive eden bu düşsel çağrışımın, Gagauz edebi ufkuna armonik bir haz kattığı dikkati çekmiştir. Dolayısıyla, düş vektörlerini hissel bir tasarımla betimleyen söz konusu sanatsal perspektif, Gagauz edebiyatındaki imgesel yapıları güçlendirerek anlam spektrumuna özgül bir renk ve ahenk yüklemiştir.

ANAHTAR KELİMELEER: Gagauz şiiri, Leb değmez sanatı, Semantik, Retorik, Analiz.

GİRİŞ

Belîğ ekseninde ilgi çekici bir edebi hüner olan lebdeğmez sanatı, ifade eksenini zenginleştiren estetik unsurlardandır. Dudak değmeden söyleme esasına dayanan bu coşkun senfoni, genelde şiirsel motiflerde ve âşık atışmalarında göze çarpar. Dudakların birbirine değmesiyle çıkan ünsüzlerin (b, f, m, p, v) lebdeğmez dizelerinde olmaması kuralı oldukça önem arz eder. Bütün amaç, dudakların birbiriyle olan temasını önlemektir. Şair atışmalarının bir hüner göstergesi olan lebdeğmez, doğaçlama bir tarzla icra edilmesiyle birlikte daha fazla değer kazandığı görülür.

Bir mısradaki, bir beyitte dudak harfleri olan (m, p, b, f, v)’nin kullanılmaması (Köklügiller, 2009: 86) işlemine dayanan lebdeğmez sanatı; dudakları birbirine değdirmeden şiir söyleme maharetidir. Söylenilen söz içerisinde, dudakların temasının muhakkak olduğu dudak ünsüzlerini kullanmadan, dudakları birbirine değdirmeden hünerle kurulmuş sözlerden oluşan manzumelerdir (Elgün, 2000: 134). Lebdeğmez, harflere dayanan bir edebi sanattır (Kayaokay, 2017: 96). Dolayısıyla, harflerin şekillerine göre değil, seslerin çıkışı esnasında iki dudağın birbirine temas edip etmemesine dayanır (Güneş, 2010: 189). Lebdeğmez denilince akla âşık edebiyatı gelir. Zira lebdeğmez sanatının, âşıklık geleneğinde önemli bir yeri vardır. Âşık karşılaşmalarının en ilgi gören bölümü “atışma” bahsidir. Atışmada, şairler hünerlerini sergileyebilmek için, karşılıklı olarak lebdeğmez sanatlı şiirleri doğaç bir üslupla terennüm ederler. Lebdeğmez, “atışmanın en zor biçimi” şeklinde yorumlanır. Bu karşılaşmada, “âşığın iki dudağının ortasına iğne veya kibrit çöpü yerleştirilir, beş sestem birini söyleyen yarışmacının dudaklarına iğne batınca başarısız olduğu anlaşılır.” (Akt. Kayaokay, 2017: 96).

BULGULAR

Gagauz edebi atmosferinden yansıyan lebdeğmez sanatının semantik bağlamdaki iz düşünümü şu şekildedir:

1.

Denizin kenarından
Yollandı güneş gökâ
Sarı izi, okundan,
Yaardı suyu ikiyâ
Üüşerlâr dalgalar
Kayıkların yanına

(Zanet, 2021: 74)

Şiirsel dizgenin anlam yelpazesinden yansıyan harmonik bileşim, lebdeğmez sanatının estetiksel yankısını iletmektedir. Görüldüğü üzere, şiirde dudak ünsüzleri olan “b, f, p, m, v” harflerinin iletim kanalından geçemediği belirmektedir. Sanatçı, güneş motifinin deniz ve kayıklar üzerinde bıraktığı coşkun etkiyi lebdeğmez unsuru vasıtasıyla tasvir etmektedir.

2.

Senin canın yaner ateş
sizde sensiz kaler tek ses
çiçeklere sener kaşın
neriy gitti kızkardaşın?

Elde kaldı sarı çiçek
ah-çektirersin, gelecek
gecenin yarısı, kışın
neriy gitti kızkardaşın?

Gene kış geçer, geler yaz
cancazı’sa sıktı ayaz,
ak yayer kara saçın
neriy gitti kızkardaşın?

Karardı açık tenin
ker çalılar yaker seni
kıskançlıktan aker yaşın
neriy gitti kızkardaşın?

Al yanarı serin çizer
sancılar kanına daler
Ah, aldattı sanki acın
gelin gider kızkardaşın.
(Arnaut, 1994: 61-62)

Şiirde, gelin giden kızkardeş izleğinden yansıyan özlem ve hüznün olgusu, lebdeğmez sanatının anlam penceresinden aktarılmıştır. Şairin duygu yüklü sözcelerle betimlediği tabloda, dudak ünsüzlerinin renk kuşağı dışında kaldığı görülmüştür. Dolayısıyla, söylem ritmine özgün bir yön çizen bu otantik bileşimin, anlamsal evrene orijinal bir betim yüklediği belirmiştir.

3.

Yalannan, zihirlân doldu ortalık,
Canınızda hiç yok insanlık!
Acızgannık duygusu da kıtlık!
Sizin yolunuz – titsi yaltaklık.
(Zanet, 2018: 118)

Şiirsel dokunun estetik hücrelerinden akseden öfke ve kızgınlık, sanatçının muhataplara yönelik düşüncelerini iletmiştir. Ortalığın yalanlarla dolup taşıdığını, insanlık duygusunun, acıma hissinin git gide azaldığını, bu yolda olanların korkunç bir yaltaklık içerisinde olduğunu dile getiren sanatçı, bu söylemini lebdeğmez aynasından yansıtmıştır. Böylelikle, estetiksel bir görüntü yakalayan şiirsel boyut, sanatçının his odağındaki saklı sanat merceğini görünür kılmıştır.

4.

Deniz sansın soluyer
Çeker kendinä,
Daa yakında uluyer
Gir dä serinnä.
(Tukan, 2010: 174)

Sanatçı; denizel etkinin yarattığı coşkun lirizmi, lebdeğmez sanatının otantik kuşağında sıra dışı bir ezgiyle senkronize etmektedir. Anlatı meridyenini güçlendirmek, sanatsal ivmeyi etkin kılmak adına, dudak ünsüzlerini kullanmayan sanatçının, lebdeğmez sanatının ekstrem dokusunu işlediği görülmektedir.

5.

Oynarsan, oyna ölä,
Ani ökçelär yansın,
Çalarsan türkü - ölä,
Ani ürektä kalsın.
(Bujilova, 2020: 27)

Lebdeğmez sanatı, dudak ünsüzlerini kullanmadan dudakların birbiriyle temasını engellemek üzerine tasarlanmaktadır. Yukarıdaki dizelerde söz konusu dudak ünsüzlerini işaretleyen “b, f, p, m, v” ünsüzlerinin şiirde yer almadığı görülmektedir. Bu seslerin söylem dışına aktarımı, şiirde lebdeğmez sanatının varlığını kanıtlar niteliktedir.

6.

Ah, te o, te - haliz ilgi
Dünnäylan, taynalı, sırlı!
Ah, nekadar hasret sızlêêr,
Ah, nekadar kahr sızêr!
(Bujilova, 2019: 184)

Sanatçının düş paletini estetiksel bağlamda renklendiren betim ekseni, lebdeğmez kuşağından geçmektedir. Anlam evrenini etkili bir söylemle zenginleştiren bu sanat, hissel çağrışımlarla söylem atmosferini yeniden dizayn etmektedir.

7.

Taşlar daanık.
Yok çıkırık.
Kazan kırık.
Dolay kıtlık...
(Zanet, 1998: 218)

Şiirde harmonik bir tarzla inşa edilen şiirsel düzlem, lebdeğmez rotasından geçen estetik raylarda anlamlandırılmıştır. Aliterasyon sanatıyla harmanlanan lebdeğmez dizgesi, anlatı orbitalinde senfonik bir imgelem yaratmıştır. Görüldüğü üzere, lebdeğmez örgesindeki yasaklı sesler olarak nitelenen dudak ünsüzlerinin, manzum yapının estetik kolonlarında yer almadığı tespit edilmiştir.

8.

İki kayık yan yana –
İçi dolu kaynana.
Kaynananın izleri –
Köör olaydı gözleri.
(Akt. Zanet, 2010: 356)

Dörtlükte, mani türünün söylem frekansında motiflenen kötü temenni faktörü, dudakdeğmez sanatının tasviri yörüngesinde sesletilmiştir. Anlatı periyodunu belîğ yönde tasvirleyen bu müzikal perspektif, şiirsel seremoniye özgün bir renk ve ahenk yüklemiştir.

9.

Yaz günündä kaar tatlı,
Kış günündä nar tatlı,
Kaarlan nar tatlı olsun –
İkisindän yâr tatlı.
(Gaydarıcı, 2018: 72)

Dörtlükte, sevgiliye dair tasarlanan duygusal izlenim, lebdğmez sanatı aracılığıyla dile getirilmektedir. Dudak ünsüzlerini işe koşmadan sunulan hissel dizilim, şairin gizil imgelem dünyasını gün yüzüne çıkarmaktadır.

10.

İlkyaz dolaya geldi -
Herersi çiçek doldu.
Sıcaklar gündän indi,
Kuşçaazlar küüyä döndü.
(Marinoglu, 1997: 75)

Şiirde; ilkbaharın gelişini müjdeleyen coşkulu söylem, lebdğmez sanatının betim şeridinden yansıtılmıştır. Şiirsel boyuta giremeyen “b, f, m, p, v” dudak ünsüzleri, anlamsal kreasyonu estetik bir üslupla yeniden dizayn etmiştir.

11.

Kukurika, kukurä,
Ötüşerlär horozlar.
Şırılêr duruk derä,
Uyanêrlar uşaklar.
(Marinoglu, 1997: 81)

Yeni bir güne başlamanın heyecanını simgeleyen şiirsel katman, lebdğmez sanatının anlam potansiyelinden ilham almaktadır. Yansıma sözcelerle motiflenen armonik tasarım, dudak ünsüzlerinin olmadığı estetiksel bir yapı inşa ederek sanatsal iz düşümün lirik ezgisini yansıtmaktadır.

12.

Suskunnuk uslu konu
Dolay erlerä,
Gecä raatlını serdi
Uykulu küüyä.
(Gaydarıcı, 2012: 20)

Sanatçı; geceyle birlikte uyuyan köyü suskunluk ve sakinlik kapladığını ifade ederken, belagat kutbundan akseden lebdeğmez metaforuna dikkat çekmektedir. Lebdeğmez sanatını belirgin kılan estetiksel görüngü, sanatçının gizil hünerinin dışa vurumunu sembolize etmektedir.

13.

Laalelär hızlı açêr,
Gün açan göktä şılêêr.
Gün geçti, gün saklandı
Laalelär dä...
(Marinoglu, 1997: 147)

Lale çiçeğinin hızlıca açılmasını, güneşin gökte parlamasını, günün saklanarak bitmesini tasvir eden sanatçı; sanatsal bir yönelimle söylem dağarcığına güç katmaktadır. Sanatçı, söz konusu devinimsel kurguyu aktarırken, lebdeğmez düzleminin coşkun ritminden haz almaktadır.

14.

Yanın yanêr gözündä
iki yaş.
Göktä yanêr yıldızlar,
nicä şaş.
(Kara Çoban, 2004: 44)

Sanatçı, kendi dil ve sanat üslubunu işe koşarak lebdeğmez sanatını icra etmektedir. Dudak ünsüzlerinin bulunmadığı estetiksel söylemde betimsel bir yön çizmiş, anlam örgesine orijinal bir tarz yüklemiştir.

15.

Karagözka,
gagauzka, -
nicä göksün,
ayozluysun!
(Köse, 2001: 127)

Şair; sevgiliye yönelik hislerini tasvir ederken heyecan faktörünün de etkisiyle mübalağa (abartma) ve tecahül-i arif (bilmezden gelme) sanatlarına gizil bir gönderme yapmaktadır. Dudak ünsüzlerinin yer almadığı şiirsel adaptasyon, belîğ kutuplu sözcelerin duygu seremonisini betimlemektedir.

16.

Çat, çıtır-çıtır,-
Tutuştı ateş.
Çat, çıtır-çıtır,-
Söledi Gergiş.
(Marinoglu, 2013:9)

Şair; yansıma sözcelerin otantik ritmiyle tasarladığı ifade ekseninde, eğlenceli bir üslup yaratmıştır. Dudakdeğmez sanatının özgün ezgisini dışa vuran bu düşsel imgelem, şairin duygu dağarcığını estetiksel bir boyuta transfer etmiştir.

17.

Ötüşerlär horozlar,
Kalkışêrlar uşaklar.
Öt - öterlär kuşcaazlar,
Dışarı çaarêr onnar.

(Marinoglu, 2013: 16)

Dörtlükte; lebdeğmez sanatı vasıtasıyla sözceler arasındaki saklı ahengi yakalayan sanatçı, müzikal bir vurguyla desenlediği coşkun söylemi, ekstrem bir doğrultuya taşımaktadır. Horozların ötüşmesi, çocukların uykudan uyanışı, kuşların ötüşmesi tarzındaki kinestetik ifadeler, lebdeğmezin his düzleminde işlenmektedir.

18.

Duran insan zeedä geler,
Itiriler, dolaştırêr.
Gölgä gölgeyi çiiineer,
Sezsiz oyunu oynêêr.
(Çimpoeş, 2001: 56)

Şiirsel yaratının derin yapısındaki saklı estetik doku, ses oyunuyla dramatize edilen lebdeğmez motifini işaretlemektedir. Dudak ünsüzlerinin alınmadığı belîğ sınırdaki, akıcı bir söylemin varlığı sezilmektedir.

19.

Ay şılâa doorutsun
Karannık erlerä,
Girginnär kalkınsın,
Cannarı kurtarsın.
(Akt. Karanfil, 2013: 24)

Sanatçı; Ay ışığının, karanlık yerleri aydınlatmasını, cesur ya da girgin kimselerin hayat kurtarmasını istemiştir. Bu istekleri dile getirirken estetiksel bağlamdan esinlenen sanatçı, lebdeğmez sanatının düş birimlerini reel boyuta taşımıştır.

20.

Geldiydi kırk kaşık,
Te artık ilk yaz,
Oynardılar aşık,
Todiylän Tanas.
(Baboglu, 2003: 127)

Şiirde, ilkyazın gelişini coşku ve heyecan öğeleriyle yoğuran sanatçı, bu duygusal çağrışımı lebdeğmez motifıyla dokumuştur. Dudak ünsüzlerinin bulunmadığı manzum tabloda, ezgisel bir tuval çizilmiştir.

SONUÇ

Gagauz edebiyatının belagat aynasından yansıyan lebdeğmez motifi, “b, f, m, p, v” dudak ünsüzlerinin şiirsel odaktan geçişini engelleme esasına dayanmaktadır. Ses ve söz oyunları ile desenlenen bu sanatsal dizilim, lebdeğmez tablosunun gizil renk skalasını resmetmektedir. Sanatçının duygu atmosferindeki saklı edebi hüneri açığa çıkaran lebdeğmezin, Gagauz yazınındaki estetiksel dokuyu orijinal bir imgelemeyle tasarladığı görülmektedir.

Çalışmada estetik iz düşümün sanat enleminde işlem gören ve şiirsel yörüngeyi geçemeyen seslerin betim tablosuna dikkat çekilmiştir. Anlam ekseninde lirik bir ezgi yaratmak adına, doğaç bir üslupla imgelenen manzum iletinin sıra dışı vurgusu sesletilmiş; harf oyunlarını simgeleyen edebi hünerin ekstrem yankısı, dudakdeğmez sanatının otantik dokusu aracılığıyla orijinal bir söylem yaratmıştır.

Çalışma, metin bağlamında tasarlanan estetik birimlerin saklı ritmini semantize ederek yorumsal tetkik yöntemini belirgin kılmıştır. Gagauz edebi ikliminde dizayn edilen manzum doku, lebdeğmez hücresinin anlam çekirdeğinde çözümlenmiş, doküman analizi unsuru işe koşulmuştur. Semantik tepkimenin gramatikal açısını reel örgelerle aktif kılan söz konusu sanatsal etkileşimin, Gagauz yazınında harmonik bir betim yarattığı tespit edilmiştir. Dolayısıyla, sanatçının his notalarını özgün bir ezgiyle sesleten bu harmonik sistem, Gagauz edebiyatının derin yapısındaki gizil düş katmanını güçlendirerek anlam atmosferini sanatsal bir ivmeyle yeniden inşa etmiştir.

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CREATIVE DRAMA IN EDUCATION

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ABSTRACT

The rules that social life imposes on individuals may help them form a traditional lifestyle and shape their personalities. Individuals, while trying to comply with the rules of society, also would want to meet their expectations. The main issue is to try and establish a balance in this dilemma. Creative Drama plays an active and important role in establishing a balance between individual expectations and the expectations of society. Every game an individual encounters, including the children's games changes with the help of creative drama and keeps up with the times. Individuals who have had creative drama training can break away from traditional perception patterns express their choices and at the same time adjust to their society.

Play pedagogy dramatization, interactive pedagogy, creative play, drama pedagogy, animation, and improvisation are some of the names and concepts that express what is meant by creative drama. The educational techniques used for personality and identity development, social harmony, and teamwork benefit from the ideas that are used in creative drama. The role plays of 'pretend' reflect the socially accepted norms.

Learning that is realized by play-acting, learning about oneself is much more conducive to learning than a teacher-taught lesson. This multidimensional teaching promotes active participation, interpersonal communication, creativity, and self-esteem. Such are the benefits of using techniques of creative drama in the classroom that ensure the personal and social development of students in a natural environment.

KEYWORDS: Education, Creative Drama, Learning.

EĞİTİMDE YARATICI DRAMA

ÖZET

Toplumsal yaşamda bulunan kurallar bireylerin geleneksel bir yaşam biçimi bir kişilik oluşturmaya neden olabilir. Bireyler bir yandan toplumun getirdiği kurallara uymak zorunda hissederken bir yandan da kendi beklentilerini karşılamaya çalışırlar. Bu ikilem karşısında esas olan bir denge kurabilmektir. Yaratıcı drama alanı toplumsal yaşantıda bu dengeyi sağlamada önemli bir rol oynar. Bireyin karşılaştığı her oyun, çocuk oyunları da dâhil, yaratıcı drama ile sürekli değişir, gelişir ve bu özelliği ile de çağa ayak uydurur. Yaratıcı drama eğitimi gören bireyler geleneksel algılama kalıplarından çıkarak bireysel tercihlerini ifade ederken topluma uyum sağlayabilirler.

Yaratıcı drama oyun pedagojisi, dramatizasyon, etkileşim pedagojisi, yaratıcı oyun, tiyatro pedagojisi, canlandırma, doğaçlama ve animasyon gibi farklı isimler ve kavramlarla ifade edilir. Eğitimde kullanılan yöntemler kişilik ve kimlik geliştirmeye, sosyal uyuma ve ekip çalışmasına yönelik olarak sınıfta uygulanırken özünde yaratıcı drama tekniklerinden yararlanmaktadır. Bu çalışmalardaki rol oynama eylemleri, toplumsal kabulü olan “-miş gibi yapma” ya dayalıdır. Bu nedenle roller aynı zamanda toplumsal rolleri oluşturur ve katılımcı ile doğrudan ilişkilidir.

Oynayarak-yaşayarak, kendini tanıyarak grup dinamiğinden hız alarak, eleştirerek, tartışarak yapılan bir öğrenme, öğretmenin anlatımı ile öğrencinin; çok boyutlu eğitimi, derslerde aktiflik, bireylerarası iletişim, yaratıcılık ve kişilik eğitimi gibi pek çok özellik yaratıcı dramının sağladığı doğal ortamda gerçekleşmiş olur.

ANAHTAR KELİMELEER: Eğitim, Yaratıcı Drama, Öğrenme.

TEACHER TRAINING IN THE GERMAN EDUCATION SYSTEM

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ABSTRACT

The article is devoted to an in-depth analysis of the German experience of teacher training by considering common design features of pre-service teacher education programs worldwide. As a rule, the experience of teacher training programs provides students with basic knowledge related to education such as psychology or sociology, which follow courses that provide professional knowledge in certain subjects, general and special pedagogical knowledge, and students acquire work experience with schools at various levels. Articulating the basic concepts, principles, and assumptions that underpin the design of teacher education programs contributes to the field in several ways. Promoting an understanding of different traditions of teacher education helps to build a common vocabulary and knowledge base as well as improves the quality of teacher education by deepening academic discourse and increasing curricular coherence. In addition, strengthening the conceptual framework of teacher education supports the professional autonomy of teacher educators by providing tools to develop debates about the goals, ethics, and politics of education, and to discuss the curriculum implications of policy reforms. Despite the mentioned similarities in the general structure, teacher training programs differ significantly in terms of their basic concepts regarding the goals and tasks that comprise the curriculum content and teacher training activities, and historical and geographical contexts which also function as factors shaping the content of teacher education programs. It is noted that studying different models, bringing similar and different features to the level of comparison, and benefiting from pioneering experiences have always been among the factors creating a foundation for progress, so in the current article, the study of the structure and implementation of teacher education in Germany, as well as the German school system, serves this purpose.

KEYWORDS: teacher training, school system, pre/in-service, curricular, experience, internship etc.

INTRODUCTION

The Federal Republic of Germany is a country in the western region of Central Europe with 357,000 km² territory and 82 million population. The legislative and administrative power of each state, i.e. Länder covers nearly all spheres of life, including the education system. Here, each state (Länder) has responsibility for the education system unless the Basic Law (Grundgesetz – R1) awards legislative powers to the Federation. The right to legislate within

the education system can encompass the school sector, the higher education sector, adult education and continuing education. Also, the administration of the education system in these areas is almost exclusively a matter for the Länder. Thus, with different regulations for curricula and schedules, professional requirements, teacher recruitment, and quality development in schools, the German system of education stands out with its complexity and heterogeneity which in turn influence the way of teacher training at universities. Also, the structure, entry and study requirements, as well as of administration procedure of the schools vary to a great extent in each of the states and this also contributes to the overall structural shaping of teacher education in Germany. Thus, teacher preparation enterprise is closely linked to the organization and structure of the different school systems in the 16 Länder and as a result of this mixed structure, there is a multitude of teaching degrees in the different Länder, ranging from teaching degrees for a particular type of school (e.g. in Bavaria) or a teaching degree for a combination of different types of schools (e.g. teaching degree for Haupt- and Realschule in Baden-Württemberg) to teaching degrees for a certain school level (e.g. primary or lower secondary school).

MATERIALS AND METHODS

In the current work we have widely used the method of synchronous description, and factual analysis as the aim put forward is the analytical description of the existing case practice in a developed country, that is Germany. Besides, the method mentioned, from time to time, we have also referred to the historical analysis and data comparisons for concluding the results. The most frequently referred authors in the field of research on teaching specificities in the German education system are Hans-Georg Kotthoff and Ewald Terhart.

RESULTS

The study of the great amount of material allows us to say that, although teacher education is still one of the hot topics for discussion of drawbacks, challenges as well as advantages, we still can make use of the working practice and consider the application of some working elements, that our system lacks. Especially, the emphasis on duality or dual study programs (i.e. study programs offering students integrated academic and vocational learning) in teacher education is noteworthy and worth considering for future reforms to teacher training programs in Azerbaijan.

DISCUSSION

According to leading researchers and educationists in the field of teacher training (Engelbert Thaler, Hans-Georg Kotthoff & Ewald Terhar etc.) the structure of teacher education in Germany and the ways leading to the teaching profession are closely linked to the organization and structure of the different school systems in the 16 Länder. For a better understanding of the overall conceptual basis of teacher training in Germany, we would first start with a short more contemporary historical background of the country and then pass to a short description of the school system in this country and then specify how future teachers are prepared to work in this system.

Historical background of a “more contemporary Germany”: the findings let us note that the first fundamental change in the education sphere in Germany was observed after World War II, starting from the 1949ies. Being defeated in the war the country was split into two parts East Germany – the German Democratic Republic, which followed the education system of the Soviet Union and West Germany – the Federal Republic of Germany the one that was not under

Russification and could survive as a Westernized. The creation of the Basic Law of Germany (Grundgesetz) which established education as one of the basic rights also coincided with this period. The second fundamental change coincides with the beginning of 1990-ies. Namely, we can speak of the unification of German states, the Federal Republic of Germany (collapse of the Berlin Wall) and the beginning of the adaptation period of the system of West Germany in East Germany. The most prominent step in the education was opening of the European Higher Education Area in 1999, the country's embarking into the Bologna Process.

Contemporary overview of the schools: Today, German is the only language of instruction and training at general education and vocational schools as well as institutions of higher education funded by the government (states). School attendance is compulsory usually until the age of 6 to 18 which equals 9/10 years full-time compulsory school attendance. Schooling is characterized by inhomogeneous and complex structures and different curriculums throughout the Federal system (*16 federal states / Land*).

Types of schools:

1. Primary school - 4 years starting at age 6 secondary school including four main types (5-8 years):

2. Middle school "Mittelschule" – forms the basic general education. Covers Grade 5 or 7 to Grade 9 or 10. The main aim of *Hauptschulen* is to offer young students with average grades or below, most of whom will not attend a university, an adequate general academic education. It qualifies students to proceed to vocational training or higher types of secondary school

Subjects that are taught at *Gymnasien*, but not at *Hauptschulen*, include Latin and Ancient Greek, while "work studies" (*Arbeitslehre*) is taught at *Hauptschulen*, but not at *Gymnasien*. It qualifies for the certificate of middle school, secondary school certificate of middle school

3. Secondary modern school "Realschule" – Grade 5 or 7 to Grade 10, Is considered extensive general education qualifies students to proceed to vocational training, upper secondary school, or a vocationally oriented upper secondary school (*Fachoberschule*) that may qualify students for universities of applied sciences. At the end of education, students get an intermediate school certificate

4. High school "Gymnasium": Grade 5 or 7 to Grade 12 or 13, and leads to the General Higher Education Entrance Qualification (*Allgemeine Hochschulreife, Abitur*), which qualifies students for university and other tertiary education. *General University Entrance Qualification*

5. Business school "Wirtschaftsschule" - Economy School or Commercial School, students are normally between 13 and 16 years of age and study a variety of traditional academic subjects, and receive training specifically geared towards a future business career and leave with intermediate school certificate.

There are also special needs schools and tertiary education schools as well, that is vocational schools or universities.

Despite the multitude of different teaching degrees, the relevant entry requirement for all university-based teacher education courses is the *Abitur* is the document which contains their grades and formally enables them to attend university, issued after candidates have passed their final exams and have had appropriate grades in both the last and second last school year. Thus, it encompasses the functions of both a school graduation certificate and a college entrance

exam. Other options for German universities can be "[Begabtenprüfung](#)" ("test of aptitude") and the Hochbegabtenstudium programme, at the least 10th grade + doing well on an IQ test.

It should also be noted that German colleges admit foreign students to the 11th and 12th grades which enables them to obtain a right to apply to university upon completion of a college. In the case of non-German students, the final exam is FSP ("Feststellungsprüfung") that is, "test to determine the suitability of applicants with foreign educational qualifications ("Bildungsausländer") for taking up studies at universities in the Federal Republic of Germany".

All of the above-mentioned are essential key points to be eligible to pursue further higher education and academic degrees regardless of the profession and major the applicants choose. So, applicants wishing to enrol at any university training them as teachers for any of the previously mentioned school types have to present Abitur or a document equivalent to it.

Preparation of teachers/educators. The German teacher education system is characterized by a three-phased consecutive model comprising academic studies at universities, pre-service teacher training at teacher training colleges and schools, and advanced training during the professional career (Hericks, 2004). In addition, this model is embedded in a complex multifaceted governance structure (OECD, 2020). Therefore, German teacher education is described as highly functionally specialized, but also as loosely coupled or even disciplinary and institutionally fragmented.

The first phase is carried out within the university and finishes with the so-called 'First State Examination' (Erstes Staatsexamen). Baden-Württemberg presents an exception in this respect because it is the only Land which provides separate 'universities of education' (Pädagogische Hochschulen) for primary and lower secondary school teacher education. Again, depending on the individual regulations of each Land, *the first university-based phase can last between 6-7 semesters* for primary school teachers and 8-9 semesters for grammar school teachers.

As an example, we can look through the curricula of the state of Berlin. Here, teacher training courses (*Lehramtsstudiengänge*) include a 6-semester Bachelor's degree programme at the beginning + a 4-semester Master's programme. Special attention should be given to the fact that if a candidate wants to get teacher certification (*Lehrbefähigung*) for school classes 1-6, 7-13 and for vocational schools she or he will be required a total of 10 semesters of studies. The curriculum comprises two to three subjects including professional studies (teaching methodology, educational sciences, etc.). A Master's degree equates to the first state exam (*Staatsexamen*). Thus, with a Master's degree, the university phase of teacher training is completed. This is followed by practical training, the traineeship. The traineeship lasts 18 months and ends with the (second) state exam.

Depending on the curriculum of university-based teacher education, future teachers study *two or three subjects, which are closely related to a corresponding academic discipline*. In addition, future teachers take classes in educational studies (including school pedagogy, educational psychology, philosophy and/or sociology of education) and serve regular school-based internships. Depending on the Land and the teaching degree, these educational courses of study together with the practical teaching placements can make up to 30% of the overall study time.

The second phase can also be called the traineeship (*Referendariat*). The study period in this phase may vary depending on the university study program from 1,5 up to 2 years. The basic highlights of this phase can be summarized as follows:

- independent of the universities
- is organized by special ‘teacher training seminars’ and ‘training schools’ supervised by the Ministry of Education of each Land
- future teachers receive a moderate salary
- have to demonstrate profession-related abilities and skills, such as lesson planning, evaluation, classroom teaching, school development etc.
- are followed by expert teachers in schools (Mentoren)
- can teach in an autonomous way
- regular and systematic evaluation and supervision (by teachers from the teacher training seminars and the teachers (sometimes the head teachers) of the training school concerned.

Third phase - The ‘Second State Examination’ (Zweites Staatsexamen- a second state examination (Zweite Staatsexamen) on candidates’ ability to reflect on their professional practice (Terhart, 2003) is realized at the end of the ‘workshop’ phase described above. This phase could last between 18 and 24 months. If successful, candidates can apply for a teaching post: their results will be classified and educational districts and schools will use this classification to allocate workplaces. After three years of professional practice, teachers are evaluated and appointed if considered adequate: if they have no career ambitions, further evaluations are not envisaged (Terhart, 2000). All regulations are issued by the Ministry of Education of each Land and not the university.

CONCLUSION

The analysis of the official guidelines, curricula and objectives of teacher education suggests that the traditional initial teacher education in Germany appears to be a highly elaborate and systematically structured system: To enter teacher education, candidates must have earned the highest school-leaving certificate. During the first phase, all teachers are educated in universities in a broad range of relevant academic disciplines for, in reality, five to six years (including the exams), they then undergo an additional practical preparation phase of 1,5 to 2 years, required to pass two state examinations and, following a short period of teaching practice, they finally obtain tenure. Based on the analysis of the official teacher education regulations, curricula and objectives and seen from an international comparative perspective, teacher education in Germany seems to be a very sophisticated enterprise. After their rather elaborate teacher training, teachers in Germany receive – in international comparison – relatively high monthly salaries (OECD 2005) and after their active working life their pensions are - compared to similar professions in Germany – also quite high. Despite these rather favourable underlying conditions, the quality of teacher education in Germany has been an object of discussion for many years. While some of these problems were identified more than 20 years ago, others have gained attention more recently through the publication of ‘new’ empirical research findings on teacher education. It is to these ‘old’ and ‘new’ problems of teacher education that we now turn to in the third and fourth part

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PREPARING OF STUDY PLANS BASED ON INTERNATIONAL PRACTICE

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ABSTRACT

Much of what has been written on the subject of curriculum design since Herrick is but a footnote to his work or modest elaboration of it. John Goodlad captured much of this tradition in his book *Planning and Organizing for Teaching* (1964) which dealt with design at three levels- the overall school level, the program level, and the classroom level. Because we tend to ignore the problem of coherence and theory, this tradition is not discussed much today.

Curriculum theorists may describe or speculate about curriculum designs, but few conceptual tools for creating them or present alternatives that commend themselves forcefully to curriculum planners as viable option considerations.

Because the concept of curriculum design itself is constantly confused (Johnson, 1969; Daniels & Coombs, 1982), some analytic work is needed to fully understand the problem of curriculum design and offer compelling new designs.

Those of us exploring the topic of this issue, "beyond the measured curriculum," appear to have agreed on a common ground for our talk about curriculum and curriculum planning. However, the specifics we attend to in imagining school settings other than those we know, and in making curriculum plans for those dreamed-of possibilities, may be expected to vary infinitely. Schooling is not a neutral process. The ethical, social, and political substructures of school life, reflecting dominant social values, fix the conditions for what we expect to happen in schools. They may set oppressive limits for students and teachers or they may open up infinite possibilities for improving the quality of life in school settings. Our responses to those conditions and substructures guide us in making decisions about where we wish to improve school life. The school settings we create and the planning approaches we engage in should be consistent with our beliefs and intentions. Our planning efforts can only be understood, indeed only have meaning, in light of our commitments and beliefs.

The differences in our values and assumptions about the most fundamental issues in our culture create differences in our approaches to schooling and curriculum. This means that the way we conceptualize curriculum and the questions we ask about it will have a critical impact on the kinds of school settings we create. Whether implied or explicitly stated, our different assumptions will yield different perspectives in talking about, studying, and planning curriculum, and in defending our curriculum decisions. In the spirit of clarifying different understandings. I recognize my responsibility for defining the beliefs, assumptions, and intentions inherent in my conceptions of curriculum and curriculum planning.

Curriculum, as I view it, is an ABSTRACTION, a metaphor for lives being lived in classrooms and schools. Metaphors are, of course, interpreted variously, meanings are assigned according to one's beliefs, values, and experiences, as well as one's hopes, visions, and dreams. So it is with curriculum, a metaphor bogged down in attempts to standardize, systematize, measure, and, in the process, dehumanize by squeezing out all remnants of the lives, the human fallibilities, and the potentialities that the term curriculum encompasses.

KEYWORDS: curriculum, education, approach, advantages, disadvantages.

INTRODUCTION

"An adequate structure or design of curriculum defines the important components or aspects of the curriculum and determines the pattern of their relationships to each other and to the curriculum jobs to be performed" (Virgil E. Herrick, 1965, p. 17).

Thus Virgil E. Herrick identified the purpose of curriculum design in one of the earliest statements on the subject by a theorist of curriculum development.

Herrick treated the topic of design as a central feature of curriculum theory. He observed: "Curriculum design is a statement of the pattern of relationships which exist among the elements of curriculum as they are used to make one consistent set of decisions about the nature of the curriculum...." (Herrick 1950, p. 37). In his view, the function of design was to help select and organize learning experiences and to indicate the role of teachers and pupils in curriculum planning and development [1].

Herrick identified a dimension of curriculum development that he considered much more crucial than simply attaining coherence among the structural elements of the curriculum. He was concerned that "the initial and basic orientation of the curriculum structure" (Herrick, 1962, p. 2) be consciously and deliberately identified. This view led him to identify a number of referents (knowledge, society, the individual) and alternative orientations (subjects, broad fields, areas of living, needs of learners) among which value issues had to be resolved and full theories of design constructed and defended.

Much of what has been written on the subject of curriculum design since Herrick is but a footnote to his work or modest elaboration of it. John Goodlad captured much of this tradition in his book *Planning and Organizing for Teaching* (1964) which dealt with design at three levels- the overall school level, the program level, and the classroom level. Because we tend to ignore the problem of coherence and theory, this tradition is not discussed much today [2].

Curriculum theorists may describe or speculate about curriculum designs, but few conceptual tools for creating them or present alternatives that commend themselves forcefully to curriculum planners as viable option considerations.

Because the concept of curriculum design itself is constantly confused (Johnson, 1969; Daniels & Coombs, 1982), some analytic work is needed to fully understand the problem of curriculum design and offer compelling new designs [3, 3-9].

RESEARCH AND FINDINGS:

Those of us exploring the topic of this issue, "beyond the measured curriculum," appear to have agreed on a common ground for our talk about curriculum and curriculum planning. However, the specifics we attend to in imagining school settings other than those we know, and in making curriculum plans for those dreamed-of possibilities, may be expected to vary infinitely. Schooling is not a neutral process. The ethical, social, and political substructures of school life, reflecting dominant social values, fix the conditions for what we expect to happen in schools. They may set oppressive limits for students and teachers or they may open up infinite possibilities for improving the quality of life in school settings. Our responses to those conditions and substructures guide us in making decisions about where we wish to improve school life. The school settings we create and the planning approaches we engage in should be consistent with our beliefs and intentions. Our planning efforts can only be understood, indeed only have meaning, in light of our commitments and beliefs.

Our differences are expressed in our approaches to curriculum and curriculum planning. For some of us, the concepts are so value-laden and personal in meaning that our attempts at the

mutual exploration of different points of view are easily defeated. This is so, I believe because curriculum planning is a complex and moral activity implying commitments and beliefs about the very nature of people and the purposes of schooling in our society.

The differences in our values and assumptions about the most fundamental issues in our culture create differences in our approaches to schooling and curriculum. This means that the way we conceptualize curriculum and the questions we ask about it will have a critical impact on the kinds of school settings we create. Whether implied or explicitly stated, our different assumptions will yield different perspectives in talking about, studying, and planning curriculum, and in defending our curriculum decisions. In the spirit of clarifying different understandings. I recognize my responsibility for defining the beliefs, assumptions, and intentions inherent in my conceptions of curriculum and curriculum planning [4, 46-52].

Curriculum, as I view it, is an ABSTRACTION, a metaphor for lives being lived in classrooms and schools. Metaphors are, of course, interpreted variously, meanings are assigned according to one's beliefs, values, and experiences, as well as one's hopes, visions, and dreams. So it is with curriculum, a metaphor bogged down in attempts to standardize, systematize, measure, and, in the process, dehumanize by squeezing out all remnants of the lives, the human fallibilities, and the potentialities that the term curriculum encompasses [4, 46-52].

A dozen years have passed since *Conflicting Conceptions of Curriculum* (Eisner & Vallance, 1973) was published. Times have changed and the assumptions Americans bring to schooling have shifted. As its co-editor, I've come to appreciate both its special value and its time-bound limitations. It demands a second look, and I shall approach my conception of the curriculum by way of a critical study of the model we presented there in 1973 [5].

In addition to a brief review and critique of the model, this article suggests some possible modifications and concludes with comments on the conception of curriculum that guides much thinking today. The comments offered are my own, I do not claim to speak for my co-editor, though I shall necessarily refer to concepts we jointly developed.

The five-part model outlined in *Conflicting Conceptions* emerged in the early 1970s, the lone survivor of many models considered and rejected at the time as being insufficiently broad, inclusive, illuminative, or representative. Other contenders included simple dichotomies, a matrix or two, at least one continuum, and an assortment of other models made up of independent discrete elements. Our task was to characterize the nature of current curriculum discourse and to identify the major themes governing it. Much curriculum discourse at the practical level seemed to lack common ground, with conversants approaching allegedly shared problems from quite different sets of definitions and assumptions [6, 24-30].

The five conflicting conceptions are (a) curriculum-making as a technological problem, (b) the curriculum as a means of developing cognitive processes in children; (c) the curriculum as a means of enabling students to reach their full self-actualized potential. (d) a social-reconstructionist view of the curriculum as the means for initiating social reform and (e) the academic-rationalist view of the curriculum as the vehicle for the transmission of civilization's intellectual heritage. The five conceptions are discrete units, mutually exclusive choices in their purest use, and options to be assessed and combined in a looser application. They are subsets of the field of curriculum studies, regions within that larger territory. As such they function as a map, describing the constituent regions while stopping short of offering guidebook instructions on how to move from one to another [6, 24-30].

There are mainly three types of curricula:

Subject-centered curriculum

Learner-centered curriculum

Broad fields or integrated curriculum [7], [8].

This curriculum design refers to the organization of the curriculum in terms of separate subjects, e.g. geography, math, history, etc. This has been the oldest school curriculum design and the most common in the world. It was even practiced by ancient Greek educators. The subject-centered design was adopted by many European and African countries as well as states and districts in the United States. An examination of the subject-centered curriculum design shows that it is used mainly in upper elementary and secondary schools and colleges. Frequently, laypeople, educators, and other professionals who support this design received their schooling or professional training in this type of system. Teachers, for instance, are trained and specialized to teach one or two subjects at the secondary and sometimes the elementary school levels.

There are advantages and disadvantages of this approach to curriculum organization. There are reasons why some educators advocate for it while others criticize this approach.

Advantages of Subject-Centered Curriculum Design

It is possible and desirable to determine in advance what all children will learn in various subjects and grade levels. For instance, curricula for schools in centralized systems of education are generally developed and approved centrally by a governing body in the education body for a given district or state. In the U.S., the state government often oversees this process which is guided by standards.

- It is usually required to set minimum standards of performance and achievement for the knowledge specified in the subject area.
- Almost all textbooks and support materials on the educational market are organized by subject, although the alignment of the text contents and the standards are often open for debate.
- Tradition seems to give this design greater support. People have become familiar and more comfortable with the subject-centered curriculum and view it as part of the system of the school and education as a whole.
- The subject-centered curriculum is better understood by teachers because their training was based on this method, i.e. specialization.
- Advocates of the subject-centered design have argued that the intellectual powers of individual learners can develop through this approach.
- Curriculum planning is easier and simpler in the subject-centered curriculum design.

Disadvantages of Subject-Centered Curriculum Design

Critics of subject-centered curriculum design have strongly advocated a shift from it. These criticisms are based on the following arguments:

- Subject-centered curriculum tends to bring about a high degree of fragmentation of knowledge.
- Subject-centered curriculum lacks integration of content. Learning in most cases tends to be compartmentalized. Subjects or knowledge are broken down into smaller seemingly unrelated bits of information to be learned.
- This design stresses content and tends to neglect the needs, interests, and experiences of the students.
- There has always been an assumption that information learned through the subject-matter curriculum will be transferred for use in everyday life situations. This claim has been questioned by many scholars who argue that the automatic transfer of the information already learned does not always occur.

Given the arguments for and against subject-centered curriculum design, let us consider the learner-centered or personalized curriculum design.

Learner-Centered/Personalized Curriculum Design

Students who have varying needs, interests, and abilities may benefit from a personalized curriculum.

Learner-centered curriculum design may take various forms such as individualized or personalized learning. In this design, the curriculum is organized around students' needs, interests, abilities, and aspirations of students.

Advocates of the design emphasize that attention is paid to what is known about human growth, development, and learning. Planning this type of curriculum is done along with the students after identifying their varied concerns, interests, and priorities and then developing appropriate topics as per the issues raised.

This type of design requires a lot of resources and manpower to meet a variety of needs. Hence, the design is more commonly used in the U.S. and other Western countries, while in the developing world, the use is more limited. To support this approach, Hilda Taba (1962) stated, "Children like best those things that are attached to solving actual problems that help them in meeting real needs or that connect with some active interest. Learning in its true sense is an active transaction." [9]

Advantages of the Learner-Centered Curriculum Design

- The needs and interests of students are considered in the selection and organization of content.
- Because the needs and interests of students are considered in the planning of students' the resulting curriculum is relevant to the student's world.
- The design allows students to be active and acquire skills and procedures that apply to the outside world.

Disadvantages of the Learner-Centered Curriculum Design

- The needs and interests of students may not be valid or long long-lasting and are often short-lived.
- The interests and needs of students may not reflect specific areas of knowledge that could be essential for successful functioning in society. Quite often, the needs and interests of students have been emphasized and not those that are important for society in general.
- The nature of the education systems and society in many countries may not permit learner-centered curriculum design to be implemented effectively.
- As pointed out earlier, the design is expensive regarding resources, both human and fiscal, that are needed to satisfy the needs and interests of individual students.
- This design is sometimes accused of shallowness. It is argued that critical analysis and in-depth coverage of subject content are inhibited by the fact that students' needs and interests guide the planning process.

The third and last type is Broad Fields or Integrated Curriculum. In the broad fields/integrated curriculum design, two, three, or more subjects are unified into one broad course of study. This organization is a system of combining and regrouping subjects that are related to the curriculum.

This approach attempts to develop some kind of synthesis or unity for the entire branch or more branches of knowledge into new fields.

Advantages of Broad Field/Integrated Curriculum Design

- It is based on separate subjects, so it provides for an orderly and systematic exposure to the cultural heritage.
- It integrates separate subjects into a single course; this enables learners to see the relationships among various elements in the curriculum.

- It saves time in the school schedule.

Disadvantages of Broad Field/Integrated Curriculum Design

- It lacks depth and cultivates shallowness.
- It provides only bits and pieces of information from a variety of subjects.

- It does not account for the psychological organization by which learning takes place.

Examples of Broad Fields:

Language Arts: Incorporates reading, writing, grammar, literature, speech, drama, and international languages.

General Science: Includes natural and physical sciences, physics, chemistry, geology, astronomy, physical geography, zoology, botany, biology, and physiology

Other: Include environmental education and family-life education

CONCLUSION

“... there is always a need for newly formulated curriculum models that address contemporary circumstance and valued educational aspirations.” [3, 3-9]

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PACIFIC PUZZLES: EXAMINIG THE GEOPOLITICAL CHESSBOARD IN THE PACIFIC OCEAN

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ABSTRACT

The Pacific Ocean has consistently commanded attention in the realm of international politics, owing to its profound geopolitical significance. Matters such as the disputes over ownership and autonomy between Taiwan and China, as well as the intricacies surrounding the Korean issue, stand out as pivotal topics that occupy a central place on the global political agenda. Much like its involvement in other international affairs, the United States actively engages in the South China Sea matter, working assertively to safeguard its strategic interests. Conversely, China, serving as the preeminent political force in the region, directly partakes in the aforementioned geopolitical processes. The complex dynamics of the Pacific Ocean make it a focal point for major global players. Notably, the region is viewed by a majority of researchers as a potential hotspot in the hypothetical scenario of a third world war. The active participation of influential nations and the interconnected nature of regional issues underscore the Pacific's role as a critical and potentially volatile arena that could significantly shape the trajectory of global.

KEYWORDS: South China Sea, political conflict, Taiwan, USA, China.

INTRODUCTION

The Pacific Ocean holds considerable significance in the contemporary political landscape, bearing a unique weight in the modern era. Despite being often characterized as "quiet" in literature, this region, home to over 2.5 million people, possesses a political history marked by turbulence and tension. The geopolitical complexity of this area involves key players such as the USA, China, Japan, North Korea, and South Korea, turning it into an arena where numerous powers, both large and small, engage in battles to safeguard their territorial governance against potential hegemonic influences. This intricate geopolitical zone is widely recognized as a chessboard by most authors, with the primary actors being the United States of America and China. The future trajectory of the Pacific Ocean, known for being a focal point of political conflicts centered around the Karelian Peninsula, the South China Sea, and Taiwan, remains uncertain. The outcome hinges on the distribution of influence among these key actors, contributing to the ongoing uncertainty surrounding the fate of this vast and strategically important region. In-depth analyses of the political landscape of the Pacific Ocean, with a focus on the roles played by the USA, China, Japan, North Korea, and South Korea, are prevalent in scholarly works (Miller, 2020; Yang & Chen, 2022).

Intoduction of The South China Sea Dispute



The South China Sea conflict is the main focus of this study, where we will examine the historical development, contemporary political perspectives and international legal context of political conflict centers in the Pacific. Regardless of analytical perspective, China has consistently emerged as a central figure in the conflict (Marywn S.S, 1989). However, in addition to China, the list of actors involved in the conflict has expanded to include Vietnam, Malaysia, Singapore, the Philippines, and Brunei (Kelsey.B, 2015). Various studies link the conflict to the rich hydrocarbon resources of the region, its geostrategic importance, important fish resources for Asian countries and even considerations of the 1982 United Nations Convention on the Law of the Sea (Leszek.B and Christopher.R, 2013).

A remarkable nuance that deserves to be highlighted is that the South China Sea, which accounts for approximately 40% of the world's trade turnover, was characterized in 1968 by the UN according to the report issued by the special committee of the Asian Far East Economic Commission. has very poor gas and oil reserves (Shicun.W, 2013 & Iuch.Y and Usui.A, 2013).

As mentioned earlier, the South China Sea, which covers an important part of global trade routes, stretches from Karimata to the Malacca Strait and from there to the Taiwan Strait (Cemre.P, 2017). The ongoing South China Sea conflict, fraught with the potential for a new war to flare up at any moment, and sporadic political dialogues between the parties involved can be attributed to China's political hegemony and its assertive claims over the islands, which are not universally accepted globally.

These islands play an important role in protecting national interests in the regional context (Fravel, 2008). Note that the disputed islands include Pratas Island located 200 miles south of Hong Kong, Paracel Island to the south, Scarborough Reef and surrounding coral reefs, and the Spratly Islands located approximately in the middle of the sea (Kelsey.B, 2015).

The competition between countries to own these islands stems from the provisions of the UN Convention on the Law of the Sea regarding the determination of territorial waters of states and the allocation of property rights over resources in special economic zones (Tom.P, 2016)

1.2 International law perspective

Based on the provisions of the United Nations Convention on the Law of the Sea, especially articles 3, 55, 57, 76 and 77, it is possible to understand a significant part of the essence of the problem. According to Article 3 of the aforementioned convention, each state can determine the extent of its territorial waters as an independent subject of international law and engage in various types of public activities in this area that do not conflict with state sovereignty and general principles of international law. This area is defined as 12 nautical miles (Herriman.M, 1997). In other words, countries such as China, Malaysia, the Philippines, Singapore, Brunei and Taiwan are the only legal parties to the use and extraction of economic and natural resources within 12 nautical miles of their territory.

If we look at the articles 55 and 57 of the Convention, these articles regulate the legal relations in the exclusive economic zones outside the territorial waters of the states in the international law of the sea. These articles define exclusive economic zones and describe them as areas within a radius of 200 nautical miles from the points where territorial waters are measured outside the boundaries and connected with these waters (UN Convention on the Law of the Sea 55/57). This inevitably refers to conflicts arising from the intersection of exclusive economic zones of actors.

Although articles 76 and 77 provide detailed information on the issues mentioned, the convention generally gives rise to controversial issues and the resolution of these issues in some cases results in the violation of legal norms established by other articles of the Convention (Michael.L, 1995 & UN Law of the Sea Convention 76/77). The main topic of dispute is natural resources, which are measured in trillions, and none of the parties wants to compromise in order not to fall behind in the distribution of these resources. This delays consensus on conflict resolution. In addition, the influence of states with economic and political interests in the region, especially the United States, is one of the most important reasons for the impossibility of consensus (Oriana.S, 2021 & Lo-Chin Kin, 1989).

1.3 China's Role in the South China Sea Dispute

Apparently, another factor complicating the South China Sea conflict, which is characterized by the complexity of the geographical area, the involvement of various internal and external actors and legal uncertainties, is the multifaceted activity carried out by the Chinese side on the islands (Hayton. B, 2014 & Matthe.S, 2016). These activities can be broadly divided into two types.

The first type involves China's attempts to strengthen its claims on the islands by asserting its historical legitimacy, a position not accepted by Western nations. This includes activities such as renaming islands (Tonesson.S, 2002). China's second type of activity involves the militarization of islands along with the construction of new artificial islands. Of course, this creates new challenges. The militarization of the region raises tensions between states that are regional stakeholders in the conflict (such as the Philippines and Taiwan) and also increases the potential for intervention by states such as the United States, India, and Japan. political interests in the current field.

Undoubtedly, the dominant actor in the South China Sea conflict, which is currently being characterized as a potential catalyst for World War III, is China. This is because the South China Sea acts as a protective barrier for the maritime defense of China's southern provinces (Mingjiang.L, 2009). Considering the strategic importance of South China as a technological center and a highly urbanized region, the protection of this area is of great importance to the vital interests of the state. Moreover, China's control over these waters increases its military maneuverability and gives the US military a significant advantage over China in the region.

Complicating China in the South China Sea conflict is the parallel political dispute with Taiwan, which will be discussed in the second part of this article. Although China claims Taiwan as its territory, it has not consistently expressed a clear position on Taiwan's position on the South China Sea issue, and in most cases refuses to engage in political dialogue with Taiwan (Kelsey.B, 2015; Mastro.O, 2021). That is why it is appropriate to claim that "the South China Sea conflict carries the potential of a second conflict - the China-Taiwan conflict." China's vulnerability to naval and air attacks and the deterrent military-political presence of the United States are the main reasons why China has not pursued a more assertive and hegemonic solution to the conflict through the use of military force.

Although the origins of the conflict in the South China Sea can be traced back to the late 19th century and arguably evolved throughout the 20th century, this article provides a political analysis of the past 30 years. A noteworthy event in this context is the first event signed between China and the United States after the long-term freezing of political relations, which was mentioned in January 1998 in connection with the "Maritime Advisory Agreement". With this agreement, China bilaterally recognized its rights related to activities and protection of the sea in the blue waters of South China. The damage to this agreement was highlighted in 2001 when a collision between a Chinese F-8 and a US Navy pilot resulted in China's death.

November 4, 2002 is a very important date in terms of the conflict gaining a new dimension. On this date, China and ASEAN issued a joint statement entitled "Declaration on the Conduct of Parties in the South China Sea". With this step, China has undoubtedly adopted a multilateral approach to the conflict for the first time. After that, one of the most important events in the course of the conflict happened in 2009 when Malaysia and Vietnam submitted a joint presentation to the UN Commission on the Limits of the Continental Shelf. The act reignited tensions over maritime sovereignty in the South China Sea. In fact, at the heart of the presentation, the parties tried to legitimize their efforts to extend their continental shelves beyond the standard two hundred nautical miles from their coastlines. (Mingjiang.L, 2009). This event, which increased political pressure in the region, led to the statement of US Secretary of State Hillary Clinton at the Asian regional security meeting held in Hanoi in 2010, emphasizing the need for open access to the South China Sea as Asia's maritime partnership.

In 2012, Vietnam submitted a bill confirming its legal rights over the Sparti and Paracel Islands. This especially increased the tension between China and Vietnam. At the end of the ASEAN summit held on July 13 of the same year, the summit statement could not be prepared because the parties could not come to a joint decision on the possible prospects for conflict resolution (Scihun.W, 2013).

As the complex conflict developed, China, like other actors, began to defend its actions with appropriate legal or historical arguments. For example, Japan bought the Senkaku/Diaoyu

Islands for \$23 billion and began supplying boats to Philippine Coast Guard posts in the East China Sea. In response, the Chinese side established an Air Defense Identification Zone to protect the airspace over the South China Sea from non-commercial aircraft. This put China 1-0 ahead of its rivals in controlling the region's airspace (Caitlin.C & Ben.D & Thomas.L, 2023)

On April 28, 2014, US President Barack Obama's Asian tour led to the US becoming a party to the conflict for the first time in political history. President Barack Obama has raised the political pressure in the region to a higher level with the 10-year agreement with the Philippines on the training of military personnel and military infrastructure issues. In spite of all these complicated events that resulted in the further increase of political pressure over time, there were events that gave hope for peace in the region during the period we are talking about. For example, Chinese President Xi Jinping and Japanese Prime Minister Shinzo Abe agreed to strengthen regional security and diplomatic relations in their first meeting (Matthew.S, 2016).

However, since 2016, China's activity in building artificial islands and arming the region complicates the resolution of the conflict. In the past five years, China has not been able to prevent the growing political and military presence of the United States in the region, despite repeatedly sending naval forces to demonstrate power and dominance near the islands (Jacelyn.T, 2022). Increased US involvement in Indonesia and Vietnam in 2021 and 2022 led to an important event on February 4, 2023, when Philippine President Ferdinand Marcos Jr. agreed with the US to open four new military bases in the Philippines, further strengthening the US. Position in the conflict in the South China Sea.

In response to these developments, on August 8, 2023, China released an updated version of its official territorial map, which now has ten dash lines and added additional dashes to the previous nine dash lines. This new map includes most of Taiwan and the Spratly Islands, which includes several territorial claims that have angered countries such as India, Vietnam, the Philippines, Malaysia and Japan (Caitlin.C & Ben.D & Thomas.L, 2023).

2.1. The Taiwan conflict is a hot political issue in the Pacific

The conflict, essentially between China and Taiwan, came to international attention on January 13, 2024, when Lai-Ching-ten won the presidential election in Taiwan. Since 1949, when communist Mao Tse Tung won the Chinese Civil War and then nationalist Chan Kaisin went to the island of Taiwan and declared the Republic of China, this conflict, which ended many times, has reached the point of armed war, and the United States has repeatedly committed crimes. The US role in this conflict still comes with a declaration that the Chinese civil war has just ended. Thus, the threat directed against the People's Republic of China and the Republic of China (Taiwan's government still operates under this name) with an attack on the United States threatened its own national security, particularly military and political. From this moment on, the US and Chinese efforts for Taiwan are still ongoing.

If we try to express the importance of Taiwan for China in the most succinct way today, we will encounter three main nuances:

1. Taiwan has a very important geostrategic and geopolitical importance. Thus, by having Taiwan, China can more easily protect its large cities located on the Pacific Ocean coast, which are economically and politically important, from possible military attacks. At the same time, the complete transfer of Taiwan to China's rule will expand the scale of its internal waters, which will strengthen China's position from the point of view of political, commercial, and food security.

2. Currently, Taiwan is the most important microchip supplier in the world, controlling microchip production. If we take into account that almost all technological devices, from ordinary mobile phones to satellites sent into space, are made of microchips, then it would not be correct to characterize the China-Taiwan conflict as a conflict between these two countries only, in which the United States occasionally participates.
3. The last and most important point is that Taiwan has already been characterized by Chinese President Xi Jinping as the biggest issue-target facing the Chinese Communist Party. The new third nuance is already derived from the ideological war. To simplify matters a bit, it is important to note that China still regards Taiwan as its territory and that neither side is using weapons against each other, especially as per the verbal agreement reached between the two sides at the 1992 Hong Kong meeting, but this trend is likely to continue. to claim is not at all comfortable under the current circumstances.

2.2. Political scenarios for the future of the conflict

China-Taiwan relations have become more complicated after Taiwan's presidential election in January 2024, which has been tense since China sent warplanes and ships to the Taiwan Strait before US House Speaker Nancy Pelosi's visit to Taiwan in 2022. Although most political commentators claim that 2024 will be the beginning of an armed conflict between the US and China over Taiwan, the current political conditions suggest that this will not happen for at least the next year. There are several objective reasons for this. The first of these reasons is that in 2024, presidential elections will be held in more than 60 countries of the world, including the United States. Without a doubt, the US will refrain from entering into an armed conflict at least until October, when the elections will be held. Of course, the military operations launched by the US and UK armed forces against the Houthi armed group in the north of Yemen are an exception. Although this issue is the subject of another study, it should be noted that in the described context, the Red Sea, where up to 15% of the world's trade turnover passes, has almost stopped moving. However, the United States would not try to go to war with China under such conditions. Moreover, despite the occasional displays of armed force, China and the United States refrain from attacking each other based on the theory of the balance of power of realism - it should not be forgotten that both sides have nuclear weapons and a powerful military arsenal - because the consequences of such a large-scale war can be unstoppable.

Although there are many facts to support this opinion, it is possible to put forward two most important arguments:

1. First, in all state-level statements regarding Taiwan, official Beijing intends to resolve the conflict by giving it a local and internal character, repeatedly stating that the "Taiwan issue" is a matter of China's internal territory and that there should be no third party interests here.
2. A second nuance is the insurmountable demographic problems that China is currently facing. So, although the demographic policy implemented by China for many years under the motto "one family, one child" prevented the population from growing rapidly in the short term, selective abortions "selecting one child in a family as a boy" had a serious impact on the gender structure of the population in China. showed. Moreover, discrimination against women in an equal society with increasing education of women day by day has resulted in one out of every three women in the country not wanting to marry and have children until at least 33 years of age. More importantly, there is no doubt that the ever-increasing elderly population will reduce China's labor force and weaken the country's economy. Summary China will not attempt a war with Taiwan due to the fact that China's family planning policy, based on the theory of demographic transitions, is gradually degrading Chinese society and undermining China's

demographic security. Because in the current political conditions, the fact that this means going to war with the United States directly plays the role of a very large deterrent, considering the previously mentioned factors.

In general, any armed conflict between China and Taiwan is unlikely in the near future, as it would both jeopardize global chip production and undermine US political interests in the Pacific. The fact that China has both demographic and economic problems, on the one hand, the strengthening of India as a political rival, and on the other hand, the presence of the US factor can be characterized as China's peaceful and patient political activity against Taiwan.

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READING BOURDIEU'S CONCEPTUAL MAP THROUGH THE FILM ONE DAY SURELY

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ABSTRACT

The movie One Day Surely has a scenario based on normative values that we can examine at the real political level. The script of the movie was written by Yılmaz Güney, and the place where the script is located bears the traces of revolutionary cinema. As it stands, the movie One Day Surely offers an opportunity to analyze the moments of social crisis and political argumentation in 1970s Turkey. By transferring his own habitus to the screenplay of the film, Yılmaz Güney can also give answers to how the field he idealized establishes a contextualism with a problematic and methodology in Turkish politics. It is also possible to read this effort of Güney as a kind of manifesto. At this point, in the study, first of all, it will be discussed in the context of which hegemony project Yılmaz Güney's habitus is tried to be transferred to the film. Secondly, the epistemology of the movie One Day Surely will be discussed in parallel with Pierre Bourdieu's concepts. Finally, the main problematics in the script of the film will be tried to be resolved by considering Bourdieu's Marxist critique of political economy.

KEYWORDS: Bourdieu, Habitus, Revolutionary Cinema, Masculine Domination, Yılmaz Güney.

BİR GÜN MUTLAKA FİLMİ ÜZERİNDEN BOURDİEU'NUN KAVRAMSAL HARİTASINI OKUMAK

ÖZET

Bir Gün Mutlaka filmi, reel politik düzeyde inceleyebileceğimiz, normatif değerler üzerine kurulu olan bir senaryoya sahiptir. Filmin senaryosu, Yılmaz Güney tarafından kaleme alınmış olup, senaryonun konumlandığı yer devrimci sinemanın izlerini taşımaktadır. Şu haliyle, Bir Gün Mutlaka filmi, 1970'ler Türkiye'sinin toplumsal kriz anlarının ve politik argümantasyonun analizini yapma fırsatı da sunmaktadır. Yılmaz Güney, filmin senaryosuna kendi habitusunu aktararak, idealize etmiş olduğu alanın, Türkiye siyasetinde nasıl bir sorunsalla ve methodolojiyle bağlamsallık kurduğunun da cevaplarını verebilmektedir. Güney'in bu gayretini bir tür manifesto mahiyetinde okuyabilmekte de mümkündür. Bu noktada, çalışma içerisinde ilk olarak, Yılmaz Güney'in habitusunun hangi hegemonya projesi bağlamında film üzerine aktarılmaya çalışıldığı ele alınacaktır. İkinci olarak, Bir Gün Mutlaka filminin epistemolojisi, Pierre Bourdieu'nun kavramlarıyla paralel olarak tartışılacaktır. Son olarak, filmin senaryosunda yer alan temel sorunsallar, Bourdieu'nun Marksist ekonomi politik eleştirisi dikkate alınarak, çözümlendirilmeye çalışılacaktır.

ANAHTAR KELİMELEER: Bourdieu, Devrimci Sinema, Eril Tahakküm, Habitus, Yılmaz Güney.

CYBERFEMINISM IN TURKEY

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ABSTRACT

The cyber revolution, which started with the birth of the internet and the rapid spread of digital technologies, is radically and rapidly changing our lifestyles, business world and communication habits. This environment, which includes information sharing, interaction and digital assets, stands out as an interaction platform that determines the social, economic and cultural lives of individuals today.

The cyber world, where digital identities, roles and experiences are reflected regardless of biological gender, addresses gender from a very broad perspective. With the emergence of gender in the cyber world, the internet, social media and other digital platforms allow individuals to openly express their gender identities and adopt various gender roles. For example, through social media, women may be represented as strong leaders, while men may be portrayed in emotional and caring roles. However, the cyber world can also cause various problems for women and LGBTQ+. Problems such as gender-based violence, discrimination and harassment are increasing in the cyber world, especially for these groups.

Turkey has a population that is mostly a consumer of the Cyber World, and today the main debate in social life focuses on cyber security both at the research level and in policies. This emphasis is striking when we look at the research conducted on the cyber world in Turkey in recent years. Despite this, the disruptive elements of social life also find their reflections in this virtual world. Research on women using the internet in Turkey shows that digital violence occurs in forms such as monitoring personal information and unwanted messages of sexual content. Unwanted messages from people they do not know, interference from close circle and interference with freedom of expression are the situations where women most frequently encounter digital violence. These findings suggest that various forms of digital violence negatively impact women's online experiences.

Key Words: Cyber World, Gender, Cyber Feminism.

TÜRKİYE'DE SİBERFEMİNİZM

ÖZET

İnternetin doğuşu ve dijital teknolojilerin hızla yayılmasıyla başlayan siber devrim, yaşam tarzlarımızı, iş dünyasını ve iletişim alışkanlıklarımızı kökten ve hızlı değiştirmektedir. Bilgi paylaşımı, etkileşim ve dijital varlıkların bulunduğu bu ortam, günümüzde bireylerin sosyal, ekonomik ve kültürel hayatlarını belirleyen bir etkileşim platformu olarak da öne çıkmaktadır.

Dijital kimliklerin, rollerin ve deneyimlerin biyolojik cinsiyetten bağımsız olarak yansıtıldığı siber dünya, cinsiyeti çok geniş bir perspektiften ele almaktadır. Siber dünyada cinsiyetin ortaya

çıkmasıyla birlikte internet, sosyal medya ve diğer dijital platformlar, bireylerin cinsiyet kimliklerini açıkça ifade etmelerine ve çeşitli cinsiyet rollerini benimsemelerine olanak tanımaktadır. Örneğin, sosyal medya üzerinden kadınlar güçlü liderler olarak temsil edilebilirken, erkekler duygusal ve bakıcı rollerde gösterilebilir. Ancak siber dünya kadınlar ve LGBTQ+ için çeşitli sorunlara da beraberinde getirebilmektedir. Siber dünyada cinsiyet temelli şiddet, ayrımcılık ve taciz gibi sorunlar, özellikle bu gruplara yönelik olarak artmaktadır.

Türkiye Siber Dünya'nın çoğunlukla tüketici konumunda duran bir nüfusa sahiptir ve bugün toplumsal hayatta temel tartışma gerek araştırma düzeyinde gerekse politikalarda *siber güvenlik odaklı* ilerlemektedir. Buna rağmen toplumsal hayatın aksak ilerleyen unsurları bu sanal dünyada da yansımalarını bulmaktadır. Türkiye'deki internet kullanan kadınlarla ilgili araştırmalar, dijital şiddetin kişisel bilgilerin izlenmesi, istenmeyen cinsel içerikli mesajlar gibi biçimlerde ortaya çıktığını göstermektedir. Tanımadıkları kişilerden gelen istenmeyen mesajlar, yakın çevre müdahaleleri ve ifade özgürlüğüne yönelik müdahaleler, kadınların dijital şiddetle en sık karşılaştığı durumları oluşturmaktadır. Bu bulgular, çeşitli dijital şiddet formlarının kadınların çevrimiçi deneyimlerini olumsuz yönde etkilediğini ortaya koymaktadır.

ANAHTAR KELİMELELER: Siber Dünya, Toplumsal Cinsiyet, Siberfeminizm.

GİRİŞ

Günümüzde teknolojinin hızlı bir şekilde evrim geçirmesi, dijital dünyanın hayatımızın vazgeçilmez bir parçası haline gelmesine neden olmuştur. İnternet, sosyal medya platformları ve dijital iletişim araçları gibi yeni alanlar, bilgiye hızlı erişim sağlama imkânı sunarak bireylerin yaşam biçimlerini ve etkileşimlerini kökten değiştirmektedir. Marshall McLuhan'ın vurguladığı gibi, teknoloji artık sadece bir araç değil, aynı zamanda insanların düşünce yapısını, davranışlarını ve toplumsal dinamiklerini şekillendiren bir uzantı halini almaktadır (Erdem ve Karakoç, 2019). Bunun sonucunda, siber dünya, insanların kimliklerini, ilişkilerini ve toplumsal rollerini yeniden tanımlama sürecinde kilit bir rol oynamaktadır. Siber dünya, geniş bir kapsamda dünya çapında bireyler arasında etkileşim kurma ve bilgi paylaşma olanağı sunarken, bu yeni alanın varlığı ve dinamikleri, cinsiyet eşitsizliği konusunda çeşitli sorunları da gün yüzüne çıkarmaktadır. Kadınlar ve LGBTQ+ bireyler, siber dünyada karşılaştıkları ayrımcılık ve şiddetle mücadele etmek zorunda kalan bir dezavantajlı kesimi temsil etmektedir. Bu noktada, siber dünyanın cinsiyet açısından birçok yönüyle incelenmesi, siberfeminizm perspektifinden önemli bir değerlendirmeyi de beraberinde getirmektedir. Siber dünyanın, cinsiyet temelli ayrımcılığın ve eşitsizliğin bir yansıması olduğunu anlamak, küresel çapta hem ülkeler arasında hem de cinsiyetler arasında var olan bu sorunlarla yüzleşmek adına önemlidir. Kadınlar ve LGBTQ+ bireyler, siber dünyada maruz kaldıkları taciz, saldırı ve diğer olumsuz etkilerle mücadele ederken, bu deneyimlerini çoğu zaman fiziksel dünyada yaşanan eşitsizliklerle de bağlantılı bir şekilde deneyimlemektedirler. Bu bağlamda, siber dünyanın cinsiyet rollerini nasıl şekillendirdiği, kadın ve LGBTQ+ bireylerin bu yeni ortamda nasıl konumlandığı ve toplumsal eşitsizliklerin siber dünyada nasıl yansıdığı temel konular arasında yer almaktadır. Bu makale, siber dünyanın hayatımızdaki etkilerini değerlendirerek, özellikle kadınlar ve LGBTQ+ bireyler açısından ortaya çıkan sorunları siberfeminizm perspektifiyle ele almayı amaçlamaktadır. Bu çerçevede, teknolojinin insanların yaşam biçimini dönüştürmesiyle birlikte ortaya çıkan bu yeni alanın, cinsiyet temelli eşitsizlikleri nasıl şekillendirdiğini anlamak ve bu konuda farkındalık yaratmak, siber dünyanın cinsiyeti konuşma biçimlerini ve toplumsal normları nasıl etkilediğini anlamak adına önemli bir adım olacaktır.

SİBER DÜNYA

Siber kavramı, ilk kez Norbert Wiener'in 1948 tarihli "cybernetics" adlı eseriyle literatüre girmiştir. Wiener, eserinde bu kavramı, hayvan ve makinede kontrol ve iletişim olarak tanımlamıştır (Baştuğ, 2023). "Siber dünya" terimi ise ilk olarak William Gibson'ın 1984 tarihli bilim kurgu romanı Neuromancer'da ortaya çıkmıştır. Bu kavram, aslında siber kelimesinin zaman içinde genişleyen bir anlam kazanmasından kaynaklanmaktadır. Zamanla, uzayın veya dünyanın sınırsız olduğu düşünülen ancak kesin bir kanıya varılamayan bir alan olması ve küreselleşmenin etkisiyle bilgisayarların hayatımızda daha etkili bir şekilde yer almasıyla birlikte, siber kelimesi yetersiz kalmış ve anlamının tam olarak bilinmemesi nedeniyle "uzay" veya "dünya" kavramları eklenmiştir. Siber dünya, global etkileşimlerin yoğun olduğu bir ortam olarak öne çıkmakta ve kullanıcıların dijital verileri depoladığı, paylaştığı ve sanal etkileşimde bulunduğu bir platformu ifade etmektedir. Bu çerçevede, bilgisayarlar aracılığıyla gerçekleşen çeşitli etkileşimlerle karakterize edilen siber dünya, dijital hareketliliğin merkezi konumundadır (Baştuğ, 2023).

Küresel ağ, hayat tarzımızı, çalışma yöntemimizi ve iletişim biçimimizi kökten değiştiren bir faktördür. Milyarlarca cihazın birbirine bağlandığı internet, bilgi paylaşımı, iş yapma ve kişiler arası ilişkileri güçlendirmeyi amaçlayan temel bir altyapı sunmaktadır. Dijital ortamın temel unsurları arasında web siteleri, sosyal medya platformları, çevrimiçi oyunlar ve büyük veri miktarları yer almaktadır. Siber dünyayı derinlemesine keşfettiğimizde, bilgi alışverişi ve dış dünyayla ilişki kurma biçimimizin sürekli evrilen dinamik bir ortamla karşılaşmaktayız. Günlük yaşantımızı, değişen sektörleri ve iletişimi önemli ölçüde etkileyen bu dijital dünya, gelecekteki heyecan verici gelişmelere ev sahipliği yapabilecek bir potansiyele sahiptir. Bu gelişmeler arasında yapay zeka ve nesnelerin interneti gibi inovatif alanlar bulunmaktadır.

Gelişen ve bağlantılı siber dünya, sınırsız olanaklar ve sonsuz bağlantılar mekânı olarak da tanımlanırken, aynı zamanda cinsiyet önyargıları ve eşitsizliklerin ortaya çıktığı bir alan haline gelmiştir. İnternetin bilgiye erişimi demokratikleştirmesine rağmen, bilinçsizce cinsiyet stereotiplerini, ayrımcılığı ve şiddeti pekiştirdiği bir mekân halini almaktadır. Evrilen teknolojiler ve dijitalleşme süreçleriyle iç içe geçmiş siber dünya, cinsiyetin yeni boyutlarını gün yüzüne çıkarmaktadır. İnternet, sosyal medya ve diğer dijital platformlar, bireylerin cinsiyet kimliklerini ifade etmelerini ve çeşitli cinsiyet rollerini benimsemelerini kolaylaştıran güçlü etkilerde bulunmaktadır. Günümüzde, siber dünyadaki cinsiyet dinamikleri, bireylerin cinsiyet kimliklerini serbestçe ifade etmelerine olanak tanısa da, aynı zamanda cinsiyetle ilgili önyargıları ve eşitsizlikleri de bünyesinde barındırmaktadır. İnternet üzerinde var olan içerikler, bilinçsizce yayılan cinsiyet stereotipleri nedeniyle toplumsal algıyı şekillendirmekte ve bireyler arasındaki eşitsizlikleri pekiştirmektedir. Bu nedenle, siber dünyada cinsiyet eşitliğini sağlamak için bilinçli çabaların ve düzenlemelerin yapılması önemlidir. Bununla birlikte, teknoloji ve siber alanlar üzerindeki etkilerin sürekli izlenmesi, toplumsal cinsiyet eşitliğini teşvik etmek adına önemli bir adım olarak ele alınmalıdır.

SİBER DÜNYA VE CİNSİYET

Son on yılda, teknoloji hayatımızı bir dönüşüme uğratarak birçok alanda önemli değişikliklere neden olmuştur. Özellikle bilgisayar teknolojisinin gelişimiyle birlikte, günlük iletişimimizde Bilgisayar Aracılı İletişim (CMC) adını verdiğimiz yeni bir tür sözlük ortaya çıkmıştır. CMC, "insanların mesajları kodlamayı, iletmeyi ve kod çözmeyi kolaylaştıran ağ bağlantılı telekomünikasyon sistemlerini kullanarak bilgi oluşturma, değiştirme ve algılama süreci" olarak tanımlanmaktadır. Bu süreç, bilgisayarların dünya çapında uluslararası ve kültürlerarası iletişimi mümkün kılmasını sağlamaktadır. CMC'nin günlük hayatımıza getirdiği katkılar oldukça çeşitlidir. Öncelikle, iletişim artık coğrafi sınırları aşarak gerçekleşebilmekte ve

insanlar arasındaki mesafeleri ortadan kaldırmaktadır. Bu, farklı kültürlerden gelen bireylerin bir araya gelerek bilgi alışverişinde bulunmalarını kolaylaştırmaktadır. Ayrıca, CMC sayesinde anında iletişim imkanı, acil durumlarda hızlı tepki vermeyi mümkün kılarak hayat kurtarıcı bir rol oynamaktadır. Geleneksel iletişim yöntemlerine alternatif olarak ortaya çıkan CMC, yazılı ve görsel iletişim araçlarını birleştirerek zengin bir iletişim deneyimi sunmaktadır. Metin, ses, video ve görsel öğelerin bir araya geldiği bu iletişim türü, duyguların ve düşüncelerin daha etkili bir şekilde ifade edilmesine olanak tanımaktadır. Bu da insanlar arasındaki anlayışı artırarak daha derin ve etkileşimli iletişimlere olanak sağlamaktadır. Ancak, bu yeni iletişim biçimi beraberinde bazı zorlukları da getirmiştir (Çubukçu ve Kutlu, 2013). Toplumsal cinsiyet eşitsizliği, bu çeşitlilik içinde kendini göstermektedir. Toplumsal cinsiyet, uzun yıllar boyunca geleneksel roller tarafından belirlenmiş ve cinsiyet eşitsizliği temelinde şekillenmiştir. Cinsiyet kavramı, bireyin biyolojik cinsiyetini temel alırken, toplumsal cinsiyet ise toplumun sosyal ve kültürel bağlamı içinde cinsiyete odaklanarak, cinsiyetin kültürel olarak "kadınlık ve erkeklik" biçiminde toplumda inşa edilmesini tanımlamaktadır. Toplumsal cinsiyet olgusu, her çağda ve toplumda farklılık gösterse de, genel özelliklerini sürdürme eğilimindedir ve etkili bir biçimde devam ettiği kabul edilmektedir (Soydan ve Küçükşen, 2022). Türkiye, bu bağlamda heteroseksüel bir yönelim sergilemektedir. Mevcut ataerkil yapı ve geleneksel normlar, siber dünyayı etkilemekte ve bu etkileşim, genellikle statükoyu sürdürmeye yöneliktir. Özellikle teknoloji sektöründeki cinsiyet eşitsizliği, CMC'nin kullanımıyla birlikte iletişimde de kendini gösterebilmektedir. Mesajların içeriği, dil kullanımı ve iletişim tarzları, toplumsal cinsiyet normlarına bağlı olarak şekillenmektedir. Bu durum, kadınların veya LGBTQ+ bireylerin iletişimde yeterince temsil edilmemesine veya dışlanmasına, şiddet görmesine neden olmaktadır. Uluslararası Af Örgütü'nün gerçekleştirdiği bir anket, kadınların %41'inin hayatlarında en az bir kez çevrimiçi tacize maruz kaldığını gösterirken, Avrupa Parlamentosu FEMM Komitesi'nin yaptığı bir araştırma da her 10 kadından 1'inin 15 yaşından itibaren siber tacize uğradığını ortaya koymaktadır. İngiltere'de LGBTQ+ hakları için mücadele veren Galop Derneği'nin 2021 Nefret Suçu Raporu'na göre, LGBTQ+ bireylerin %60'ı çevrimiçi tacize maruz kaldığını ifade etmiştir. (Şener ve Abınık, 2021). Bunun yanında siber dünyanın cinsiyet boyutları, çevrimiçi platformlardaki içerik oluşturma ve kullanıcı etkileşimleri üzerinden de vurgulanmaktadır. Cinsiyet normlarına meydan okuyan dijital hareketler, aktivist gruplar ve çeşitli kampanyalar, siber dünyada cinsiyet farkındalığını artırmak ve toplumsal değişimi teşvik etmek adına önemli bir rol oynamaktadır. Sonuç olarak, sınırsız olanakların bir sahası olarak görülen dijital dünya, aynı zamanda cinsiyet eşitliği için bir mücadele alanına dönüşmüştür. İnternet, bilgiye ve iletişime demokratik erişimi sağlarken, cinsiyet stereotiplerini, ayrımcılığı ve şiddeti pekiştirmekte de rol oynamaktadır. Evrilen teknolojiler ve dijitalleşme süreçleriyle iç içe geçmiş siber dünya, cinsiyet çeşitliliği için fırsatlar sunarken aynı zamanda cinsiyet normlarına karşı zorluklar ortaya çıkarmaktadır.

SİBERFEMİNİZM

Feminist tartışmaların başlangıcı, 1789 Fransız İhtilali'nin ardından ortaya çıkan İnsan Hakları Bildirgesi'ne yönelik eleştirilerle başlamaktadır. İnsan Hakları Bildirgesi'nde kadın haklarına yer verilmemesi, dönemin kadın yazarları ve aktivistleri arasında büyük bir tepkiyle karşılanmıştır. Bu duruşa karşı çıkan önemli isimlerden biri olan Olympe de Gouges, 1791'de yayımladığı Kadın ve Kadın Yurttaş Hakları Bildirgesi'nde kadınların erkeklerle aynı haklara sahip olması gerektiğini savunmuştur (Gedik, 2020). Bununla birlikte, Mary Wollstonecraft'ın "Kadın Haklarının Bir Savunusu" adlı eseriyle Fransız İhtilali'nin eşitlik ilkesinin cinsiyetler arasında da geçerli olması gerektiği vurgulanarak birinci dalga feminizmin temelleri atılmıştır. Bu dönemin odak noktası, yasalar önünde eşitliğin sağlanması ve kadınların oy kullanma,

yönetimde söz sahibi olma, fırsat eşitliği gibi konulardaki talepler ön planda yer almaktaydı (Akan ve Gürhan, 2020).

İkinci dalga feminizm, 1960'larda ortaya çıkarak, birinci dalga feminizmin sadece yasal alandaki eşitlikle sınırlı kaldığı gerekçesiyle ortaya çıkmıştır. Simone de Beauvoir'ın "kadın doğulmaz, kadın olunur" sözüyle başlayarak, kadınlar cinsellikleri ve bedenleri üzerine konuşarak toplumsal cinsiyet normlarına meydan okumuşlardır. Bu dönem, kadınların toplumsal ve özel alanlardaki sorunlarına derinlemesine odaklanarak eğitim, sağlık, çocuk bakımı, kürtaj ve tecavüz gibi konuları ele aldığı bir dönem olarak bilinmektedir.

1990'larda ortaya çıkan üçüncü dalga feminizm, diğer feminist dalgalarından farklı olarak, toplumsal sınıf, ırk, etnisite, cinsiyet, cinsellik, milliyetçilik, siyaset ve ekonomi gibi konulara geniş bir perspektiften yaklaşmıştır. Bu dönemde, sadece erkek ayrıcalıkları eleştirilmedi, aynı zamanda "savaş, güvenlik, ekonomik kalkınma, az gelişmişlik, çevre sorunları, sosyal eşitlik, toplumsal gruplara saygı, adalet ve eşitlik" gibi bir dizi konuda alternatif bakış açıları geliştirilmeye çalışıldı (Akan ve Gürhan, 2020). Ayrıca, kadın hareketi içinde çeşitlilik ve kapsayıcılık öne çıkmıştır; Müslüman feministler, LGBTQ+ hareketleri ve Queer feminist tartışmalar gibi konular gündeme gelmiştir. 1990'lı yıllardan itibaren teknolojinin hızla gelişmesi, feminist düşüncenin siber dünya ile ilgili yeni bir alan yaratmasına neden olarak siberfeminizmin ortaya çıkmasına sebep olmuştur. Siberfeminizm, teknolojinin ilerlediği ve internetin her alanda etkili olduğu bir toplumda gelişen bir akımdır. Siber dünyadaki varlığıyla, siberfeminizm kadın sorunlarını geleneksel toplumdan dijital dünyaya taşıma hedefi taşımaktadır. Ataerkil yapı ve düşüncelerin teknoloji ve siber uzantılarla birleşmesi, feminizm için bir eksiklik yaratmış ve siberfeminizm bu boşluğu doldurmak amacıyla ortaya çıkmıştır. Siberfeminizmin temel odak noktası, internet ve teknoloji aracılığıyla cinsiyet kimlikleri ile ilgili sorunlara yönelik çözümler üretmektir. Bu hareket, siber kültürün bireylerin cinsiyetsizleşme potansiyeli aracılığıyla ataerkiye karşı direnç oluşturabileceğini savunmaktadır. Siborg beden kavramı, siber uzayın, bireylerin cinsiyetsizleşme potansiyeli ile cinsiyet eşitliği fırsatları sunabileceği tezini ileri sürmektedir. Haraway'in bakış açısına göre, siborg, makine ve organizmanın birleşimi olarak, cinsiyetleri inşa etme ve ortadan kaldırma yeteneğine sahip olmaktadır. Siberfeminizmin temel amacı, siber uzayın cinsiyetle ilgili normlarını sorgulayarak ve değiştirerek özgürlüğü ve çeşitliliği teşvik etmeye odaklanmaktadır (Aydemir ve Genç, 2022). Teknoloji ile toplumsal cinsiyet arasındaki ilişki incelendiğinde, tasarım ve kullanım süreçlerinde herhangi bir cinsel eğilim olup olmadığı sorusu ortaya çıkar. Literatür, birçok teknolojinin karmaşık bir şekilde cinsiyetlendirildiğini göstermektedir. Siberfeminizm, siber kültürün bir sonucu olarak ortaya çıkan bir zorunluluk olarak bazıları tarafından değerlendirilirken, diğerleri içinse hayalperest bir iyimserlik biçiminde ele alınmaktadır. Bu hareket, feminist perspektifleri siber alanlara entegre etmeye çabalayarak, dijital dünyadaki cinsiyet eşitsizlikleri ve ataerkil kalıpların dijital ortama taşınmasına karşı durmaktadır. Siber feminizm, teknoloji ve cinsiyet politikalarının kesişiminde önemli bir rol oynayarak, dijital alanın daha adil, özgür ve eşitlikçi bir yer olmasını amaçlamaktadır.

SİBER DÜNYADA TOPLUMSAL CİNSİYET EŞİTSİZLİĞİ

Toplumsal cinsiyetle siber dünya arasındaki ilişki incelendiğinde, siber dünyanın cinsiyeti konusundaki tartışma ön plana çıkmaktadır; teknolojinin tasarımı ve kullanımında herhangi bir cinsiyet temsilinin olup olmadığı ve bu temsilde herhangi bir dengesizlik bulunup bulunmadığı sorusu aslında gündeme gelmektedir. Toplumsal cinsiyet ve siber dünya konusundaki literatür, birçok teknolojinin karmaşık biçimde toplumsal cinsiyet normlarına göre şekillendirildiğine işaret etmektedir. Deborah G. Johnson'ın (2006) ifadesiyle, teknoloji toplumsal etkileşimlerle şekillenmiş ve toplumsal cinsiyet kalıpları da bu temel teknoloji ile birlikte yeniden üretilmiştir.

Öte yandan, madalyonun diğer yüzünde, teknoloji toplumu etkileyerek şekillendirmektedir. Eğer toplumsal cinsiyet, teknolojiye kodlanmışsa, bu durumda teknolojinin de toplumsal cinsiyet normlarını pekiştirdiği söylenmektedir (Fox, Johnson ve Rosser, 2006). Siber dünyada, toplumsal cinsiyet normlarına uygun olmayan birçok örnek bulunmaktadır. Ataerkil yapının hakim olduğu bir ortamda, kadınlar ve LGBTQ+ bireyler sıklıkla dezavantajlı konumda bulunabilirler. Bu durum, siber dünyadaki çeşitli platformlarda, içeriklerde ve etkileşimlerde kendini göstermektedir. Siber dünyada yer alan cinsiyet kodlarının genellikle erkeklerin perspektifinden şekillendiği ve bu kodlara uygun olarak tasarlanan alanların olduğu düşünülmektedir. Programlamada, yazılımda ve diğer teknoloji alanlarında çalışan kadınların sayısının az olması, bu kodların genellikle erkek bakış açısını yansıttığını göstermektedir. Ayrıca, bilgisayarın bile erkek eşyası olarak algılanması, toplumsal cinsiyet normlarının teknoloji dünyasında nasıl yerleşik olduğunu gösteren bir örnektir. Bu tür algılar, teknoloji tasarımı ve kullanımında cinsiyet eşitsizliğinin nasıl sürdüğünü gösteren önemli göstergelerdir. Sonuç olarak, siber dünyadaki toplumsal cinsiyet normları ve eşitsizlikleri anlamak, hem teknolojinin toplumu nasıl şekillendirdiğini hem de toplumsal cinsiyetin teknoloji üzerindeki etkilerini değerlendirmeyi gerektirmektedir.

Siber Dünyada Dijital Erişim Ve Kullanımda Eşitsizlik

Bilgi ve iletişim teknolojileri, günümüz toplumunda neredeyse her alanda etkili olan bir güç haline gelmiştir. İnternet, sosyal etkileşimi düzenler, genişletir, yerel konuları küresel boyuta taşır, değer yaratır, bilgiyi yaygınlaştırır ve inançlarımızı şekillendirir. Farklı sektörler arasındaki bağlantılar, bankacılık, sağlık, eğitim ve hükümet işleri gibi alanlarda daha fazla entegrasyon sağlamaktadır. Bu entegrasyonlar, ekonomik büyüme ve yenilik için çeşitli fırsatlar sunmaktadır. Yüksek hızlı geniş bant erişimi, ülkelerin, bölgelerin ve toplulukların sosyoekonomik gelişimi için kritik bir faktör olarak kabul edilebilir, çünkü çağdaş telekomünikasyon teknolojilerinin evrimine olanak tanımaktadır. Ancak, ne yazık ki, yüksek hızlı geniş bant erişimi hâlâ eşit bir şekilde dağılmamış durumdadır (Clercq, D'Haese ve Buyse, 2023).

Ülkeler arasındaki eşitsizlik, özellikle gelişmekte olan ve gelişmiş ekonomilere sahip ülkeler arasında belirgin bir şekilde görülmektedir. Gelişmiş ülkeler, genellikle daha gelişmiş altyapı, finansal kaynaklar ve teknolojik imkanlara sahip olduklarından, yüksek hızlı geniş bant erişimine daha kolay ulaşabilmektedirler. Bu durum, bilgiye erişim ve dijital hizmetlere katılım açısından dezavantajlı ülkelerin rekabet gücünü olumsuz etkilemektedir. Eğitim, sağlık hizmetleri ve ekonomik fırsatlar gibi temel alanlarda mevcut olan bu eşitsizlikler, dijital uçurumu daha da derinleştirmektedir. 2022 itibarıyla Avrupa'da internet kullanıcılarının oranı dünya genelinde en yüksek seviyededir. Kadın nüfusunun %89'u ve erkek nüfusunun %90'u internete erişim sağlamaktadır. Buna karşın, BDT bölgesinde internet kullanıcılarının %83'ü kadın ve %84'ü erkek olarak belirlenmiştir, bu da bölgeyi dünya çapında ikinci sıraya yerleştirmektedir. Amerika kıtasında ise kadın ve erkek internet kullanıcılarının oranı %83 seviyesindedir. Türkiye, Ocak 2022 itibarıyla yaklaşık 70 milyon internet kullanıcısına ev sahipliği yapmaktadır ve bu sayede ülke, dijital nüfus açısından dünya genelinde 15. sırada yer almaktadır. 2022'de kadın internet kullanıcılarının oranı %81'e ulaşmışken, erkeklerin oranı %89'un üzerine çıkmıştır. Türk halkı için internete bağlanmanın temel nedeni, mesajlaşma, arama veya sosyal ağlar aracılığıyla başkalarıyla bağlantı kurmaktır. Arap Devletleri'nde ise kadın ve erkek internet kullanıcılarının oranları arasında önemli bir fark bulunmaktadır. Bölgede kadınların %65'i internete ulaşırken, erkek nüfusunun internet kullanma oranı %75'tir. Düşük ve orta gelirli ülkelerde mobil internet kullanımında da cinsiyet farkı gözlemlenmektedir. Afrika ise internet erişimi açısından en düşük seviyede bulunan bölge olarak öne çıkmaktadır. Son verilere göre, Afrika'nın kadın nüfusunun %34'ü, erkek nüfusunun

ise %45'i çevrimiçi erişime sahiptir. 2022 itibarıyla Afrika'nın çevrimiçi erişim oranı, dünya genelinde en düşük seviyededir ve toplam nüfusun %30'undan biraz fazlası internet kullanmaktadır. Küresel ortalama çevrimiçi kullanım oranı ise %51'dir. Afrika ile geri kalan dünya arasındaki bu teknolojik uçurum, kıtada bilgi ve iletişim teknolojilerine sürekli yatırım yapılması ihtiyacını vurgulamaktadır (Dierks, 2023). 1990'ların ortalarından itibaren, geniş internet ve sosyal medya kullanımı, LGBTQ bireyler için önemli bir araç haline gelmiştir, özellikle cinsel ve cinsel azınlıkların güçlenmesi açısından değerlendirilmiştir. Literatürde, LGBTQ+ bireylerin kimlik keşfi sürecinin genel çerçevesi içinde, internetin iki temel işlevi belirlenmiştir: Birincisi, internet, ilgili bilgilere kolay ve gizli bir şekilde erişim sağlamıştır; ikincisi ise izole edilmiş ve coğrafi olarak dağılmış popülasyonlara, genellikle anonimlik örtüsü altında diğerleriyle bağlantı kurma olanağı tanımıştır. Ancak, gözlemleniyor ki LGBTQ+ bireyler, siber dünyada kendilerine yer bulma konusunda anonimlik ve gizlilik etrafında şekillenebilmektedirler. Bu noktada, birçok ülkede LGBTQ+ bireylere yönelik uygulama kısıtlamaları veya sansürlerle karşılaşmaktadır (Dhoest ve Ouytsel, 2023). Türkiye, bu durumda benzer bir tabloyu yansıtmaktadır. Cinsiyet temelli eşitsizlik, özellikle gelişmekte olan ülkelerde kadınların dijital dünyaya sınırlı erişimine dair önemli bir sorun olarak karşımıza çıkmaktadır. Bu durum, genellikle erkeklerin kadınlara göre daha fazla internet erişimine sahip olduğu bölgelerde belirginleşmektedir. Eğitim, istihdam ve sosyal katılım gibi kritik alanlarda bu eşitsizlik, kadınların potansiyellerini tam olarak gerçekleştirmelerini engelleyebilmektedir. Gelişmekte olan ülkelerdeki kadınların internete daha az erişimini anlamak için, özellikle Arap devletlerindeki cinsiyet bazlı internet kullanımındaki farklılıkları değerlendirmek gerekmektedir. Bu bölgede, erkekler ile kadınlar arasındaki internet kullanıcıları arasındaki büyük farklar, kültürel normlar, eğitim seviyeleri, ve sosyo-ekonomik faktörlerle ilişkilidir. Arap devletlerinde, kadınların dijital dünyaya erişimini kısıtlayan faktörlerden biri kültürel normlardır. Toplumun belirli kesimlerinde kadınların internet kullanımına dair olumsuz görüşler ve bu alandaki kısıtlamalar, kadınların dijital becerilerini geliştirmelerini engelleyebilmektedir. Eğitim seviyelerindeki farklılıklar da kadınların dijital dünyaya katılımlarını sınırlamaktadır. Kadınların eğitim olanaklarındaki kısıtlamalar, dijital becerilerini geliştirmelerini ve online kaynaklara erişimlerini zorlaştırmaktadır. Sosyo-ekonomik faktörler de cinsiyet temelli dijital eşitsizlikte rol oynamaktadır. Kadınların işgücüne katılımındaki kısıtlamalar, ekonomik bağımsızlıklarını elde etmelerini ve teknolojiye erişimlerini sınırlamaktadır. Bu duruma yönelik, kadınlara eğitim ve istihdam fırsatları sunmak, dijital becerilerini geliştirmelerini teşvik etmekte ve cinsiyet temelli eşitsizlikle mücadelede önemli bir adım olmaktadır.

Teknoloji Sektöründeki Cinsiyet Eşitsizliği

Teknoloji sektörü, günümüzde hızla gelişen ve evrimleşen bir alandır. Ancak, bu sektördeki cinsiyet eşitsizliği, teknolojik ilerlemenin gölgesinde kalmış ve dikkate alınmayan bir sorun olarak öne çıkmaktadır. Cinsiyet eşitsizliği, teknoloji sektöründe genellikle toplumsal normlar, kültürel beklentiler ve eğitim sistemlerinden kaynaklanan bir dizi nedenle beslenmektedir. Toplumda kadınlar genellikle matematik ve bilim alanlarında erkeklerle yarışırken karşılaştıkları önyargılarla mücadele etmek zorunda kalırken, bu durum teknoloji sektöründeki kadın sayısını azaltmaktadır. Ayrıca, sektör içindeki ayrımcılık ve erkek egemen kültür de kadınların ilerlemesini sınırlayan önemli faktörler arasında yer almaktadır. Teknoloji sektöründeki cinsiyet eşitsizliği, sadece bireylerin kariyer olanaklarına değil, aynı zamanda şirketlerin ve endüstrinin genel başarısına da etki etmektedir. Farklı bakış açıları ve deneyimlerin eksikliği, yaratıcılık ve inovasyonu engellemektedir. Ayrıca, cinsiyet eşitsizliği, sektördeki insan kaynağı havuzunu daraltarak nitelikli profesyonellerin eksikliğine yol açmaktadır. 2020 yılına ait Statista raporunu incelediğimizde, günümüzde yazılım sektöründeki

cinsiyet dağılımının oldukça dikkat çekici olduğunu gözlemlemekteyiz. Rapora göre, yazılım geliştirme alanında faaliyet gösteren bireylerin %91.5'i erkektir. Bu da demektir ki, her 10 yazılım geliştiriciden sadece 1'i kadındır. Türkiye'de de benzer bir eğilim gözlenmektedir ve ülkemizdeki oranlar, küresel düzeydeki istatistiklerle uyumludur (Şener ve Abınık, 2021). Bu durum, yazılım sektöründe cinsiyet temelli bir dengesizliğin hâlâ belirgin bir şekilde devam ettiğini ortaya koymaktadır. Kadınların yazılım geliştirme alanındaki katılımının düşük olması, sektördeki potansiyel yeteneklerin tam anlamıyla kullanılamadığını ve çeşitliliğin sağlanamadığını göstermektedir. Bu sorunla başa çıkmak ve yazılım sektöründe cinsiyet eşitliğini teşvik etmek, hem sektörün gelişimi hem de toplumun genel çıkarları açısından önemlidir. Eğitimde, iş yerinde ve toplumda cinsiyet eşitliği konusundaki farkındalığın artırılması ve çeşitliliğin desteklenmesi, yazılım sektörünün daha kapsayıcı ve yenilikçi hale gelmesine katkı sağlayabilir.

Siber Dünyada Cinsiyet Bağlamında Şiddet

Cinsiyet, insan toplumlarının temel yapı taşlarından biridir ve tarih boyunca toplumsal normlar, roller ve beklentiler etrafında şekillenmektedir. Ancak, günümüzde siber dünya adını verdiğimiz dijital ortamlar, cinsiyetle ilgili konularda yeni ve karmaşık alanlar ortaya çıkarmıştır. Bu dijital dünya, iletişim, etkileşim ve bilgi alışverişi konularında giderek daha fazla kullanılmakta ve bu durum, cinsiyet bağlamında şiddetin dijital platformlarda da görülmesine yol açmaktadır. Bu noktada siberfeminizmin bir diğer temel amacı, siber dünyada cinsiyete yönelik taciz ve şiddetin etkili bir biçimde engellenmesidir. Son yıllarda elektronik ve bilgisayara dayalı iletişim ve bilgi paylaşımının hızla artması, bireylerin sosyal etkileşimlerini, öğrenme alışkanlıklarını ve eğlence tercihlerini önemli ölçüde değiştirmiştir. Elektronik posta, web siteleri, mesajlaşma uygulamaları, web kameraları, sohbet odaları ve sosyal medya gibi elektronik iletişim araçları, internet üzerinden yapılan sosyal etkileşimi artırmıştır (Aksaray, 2011). Ancak, bu artan dijitalleşme aynı zamanda siber dünyada cinsiyete dayalı taciz ve şiddetin de artışına neden olmaktadır. Özellikle çevrimiçi platformlarda, bireyler cinsiyetlerine dayalı ayrımcılık, saldırı ve tacize maruz kalabilmektedir. Bu tür şiddet, literatürde farklı terimlerle ifade edilen bir olgudur, örneğin "siber şiddet, siber zorbalık, siber taciz, siber tartaklama, sanal şiddet, sanal zorbalık, çevrimiçi şiddet ve elektronik zorbalık" olarak adlandırılmaktadır (Seçgin ve Selçuk, 2023). Dijital şiddet, genellikle "dijital medya üzerinden zarar veya rahatsızlık verme amacıyla başka bireylere karşı düşmanca tavırlar sergileyerek saldırgan davranışlarda bulunmak" olarak tanımlanmaktadır. Bu tür şiddetin örnekleri arasında tekrarlı ve saldırgan mesajlar gönderme, bir bireyin onurunu zedelemek amacıyla asılsız iddialarda bulunma, kişisel bilgileri izinsiz açıklama, birini çevrimiçi bir topluluktan bilerek dışlama gibi davranışlar bulunmaktadır. Dijital şiddetin diğer örnekleri arasında bireylerin fotoğraflarını istismar etme, cinsel içerikli veya aşağılayıcı yorumlarda bulunma, tehditler savurma, iletişim araçları veya sosyal medya üzerinden küfürlü dil kullanma, rahatsızlık verici şekilde takip etme, başka bireylerin sosyal medya veya e-posta hesaplarına ulaşmaya çalışma, virüs içeren e-postalar gönderme, diğer bireyleri pornografik içeriklere maruz bırakma veya pornografik içerik üretmeye zorlama yer almaktadır (Seçgin ve Selçuk, 2023). Dijital şiddetin çeşitli biçimlerde ortaya çıkabilmesi, özellikle kadına karşı dijital şiddetin önemli bir sorun olarak ortaya çıkmasına neden olmaktadır. Dijital şiddet, modern iletişim teknolojilerinin sunduğu imkanlar sayesinde hızla yayılan bir tehdit haline gelmiştir. Bu tür şiddet, özellikle telefonlar, bilgisayarlar, tabletler gibi cihazlar ve sosyal medya, e-posta, bloglar gibi dijital platformlar aracılığıyla gerçekleştirilen tehdit, taciz, şantaj ve ayrımcılık gibi eylemleri kapsamaktadır. Kadının tarihsel olarak erkeğin "öteki" olarak görüldüğü her dönemde, medya bu konumu pekiştirirken, yeni medya araçlarının gelişimiyle birlikte kadına yönelik dijital şiddet vakaları daha da yaygın hale gelmektedir. Toplumsal cinsiyet stereotiplerinin dijital

ortamda sürekli olarak dolaşıma girmesi, kadına yönelik dijital şiddetin çevrimiçi ortamlarda daha sık görülme olasılığını arttırmaktadır. Bu durum, geleneksel şiddetin aksine dijital şiddetin de ataerkil düzenin, cinsiyet rollerinin ve kadın üzerindeki egemenliğin sürdürülmesine hizmet ettiği anlamına gelmektedir. Kadına yönelik dijital şiddet, Birleşmiş Milletler'in 2030 yılına kadar cinsiyet eşitliğini sağlama hedefine zarar veren ve cinsiyet uçurumunu derinleştiren bir risk halini almaktadır (Sarışın, 2022). Anonimlik ve uzaktan iletişim, bu tür saldırılara karşı cezasızlık duygusunu artırabilmektedir. Siberfeminizmin bu noktada önemli bir rolü bulunmaktadır. Bu hareket, dijital ortamda cinsiyet eşitsizliği ve şiddetle mücadele etmeyi hedeflemektedir. Toplumsal cinsiyet normlarına meydan okuma ve dijital alanda güvenli bir ortam sağlama amacıyla siberfeminist gruplar, bilinçlendirme kampanyaları düzenleyerek, çevrimiçi şiddeti önlemek ve mağdurlara destek olmak için çeşitli girişimlerde bulunmaktadır. Ancak, siber dünyada cinsiyete yönelik taciz ve şiddeti engellemek için daha fazla çaba sarf edilmesi gerekmektedir. Toplulukların, platformların ve yasal düzenlemelerin bu konuda daha etkili önlemler alması, çevrimiçi alanın cinsiyet eşitliğine ve güvenliğine daha fazla katkı sağlaması önemlidir. Ayrıca, siberfeminizmin sesini daha geniş kitlelere duyurarak, cinsiyete dayalı şiddetle mücadelede farkındalık yaratma ve toplumsal değişime öncülük etme rolü de büyük bir öneme sahiptir.

SİBER DÜNYADA CİNSİYETLERİN SERGİLENMESİ

Günümüzde, siber dünyada cinsiyetlerin nasıl sergilendiği, toplumun dijital alanlarda yaşanan cinsiyet eşitsizlikleriyle nasıl başa çıktığını gösteren önemli bir konudur. Siber dünyada cinsiyetlerin sergilenmesi, genellikle erkek egemen bir yapıyla ilişkilidir. Oyun sektörü, özellikle kadınların karşılaştığı zorlukları gösteren önemli bir örnektir. Oyun karakterlerinin ve hikayelerinin genellikle erkek odaklı olması, kadınların oyun sektöründeki varlığını sınırlayan bir etken olarak karşımıza çıkmaktadır. Bu durum, kadınların siber dünyada yeterince temsil edilmediği, hatta bazen cinsiyetçi ve ayrımcı içeriklere maruz kaldığı bir ortamın varlığını göstermektedir. Crawford'un üniversite öğrencileri üzerinde yaptığı bir araştırma, kadınların genellikle erkeklerden daha az dijital oyun oynama eğiliminde olduğunu ortaya koymuştur. Özellikle 80'lerde, video oyunlarının çoğunun erkeklere yönelik olduğu belirtilmiştir. Bu durum, piyasaya sürülen oyun türlerinin genellikle erkek odaklı olmasından kaynaklanmaktadır (Arda, Kaya ve Çakır, 2021). Özellikle oyunun erken dönemlerinde, genellikle aşırı erkeksi kahramanlar öne çıkarken, kadın karakterler sıkça ikincil rollerde yer almıştır. Eğer oyunlarda kadın karakterler bulunuyorsa, genellikle cinselleştirilmiş ya da pasif bir şekilde tasvir edilmektedirler. Dijital oyunlar, toplumsal cinsiyet normlarını pekiştiren temel örnekler sunmaktadır. Kadınlar, genellikle kurtarılması gereken zayıf figürler olarak değerlendirilmekte ve oyunlarda sınırlı bir yaşam varlığı göstermektedirler. Bu durum, toplumsal cinsiyetin oyun dünyasında nasıl inşa edildiğine dair önemli bir gösterge olarak değerlendirilmektedir. Diğer bir önemli gösterge olarak #MeToo hareketi, siber dünyada cinsiyet eşitsizliğine karşı bir tepki olarak ortaya çıkmış ve cinsel saldırı ve taciz mağdurlarının sesini yükseltmeye odaklanmıştır. Dijital çağrı yapma uygulamaları, özellikle hashtagler aracılığıyla, gündelik hayatın parçası olmayan sosyal ve politik konuların gündelik hayat içinde daha görünür hale gelmesini sağlamaktadır. Bu uygulamalar, dijital platformlarda toplulukları bir araya getirerek kolektif farkındalık oluştururken, aynı zamanda bu konuların geniş bir izleyici kitlesiyle etkileşim kurmasını mümkün kılmaktadır. Hashtagler, belirli bir konuyu veya hareketi temsil eden etiketler olarak kullanıldığında, bu etiketlerin popülerliği ve yaygınlığı, ilgili konuların kamuoyunda daha fazla dikkat çekmesine yol açmaktadır. Bu durum, dijital aktivistlerin, sosyal medya ve diğer dijital platformlar üzerinden seslerini duyurarak toplumsal değişimde etkili bir araç olarak kullanmalarını sağlamaktadır. Dolayısıyla, dijital çağrı yapma uygulamalarının, gündelik hayatın dışında kalan konuların toplumsal bilincin merkezine taşınmasında önemli bir

rol oynadığı söylenebilir. Ancak, bu hareketin dijital alanda güçlü bir etkisi olmasına rağmen, hala birçok platformda kadınların cinsel tacize uğraması ve ayrımcılığa maruz kalması gibi sorunlar devam etmektedir. İran'da kadın hakları mücadelesi, siber dünyada da önemli bir rol oynamaktadır. İranlı kadınlar, sosyal medya ve diğer dijital platformlar aracılığıyla kendi haklarını savunmakta ve seslerini duyurabilmektedirler. Ancak, bu çabalar genellikle devletin sıkı denetimi altında gerçekleşmekte ve kadın aktivistler sıkça zorluklarla karşılaşmaktadır. Türkiye'de ise kadın cinayetleri, siber dünyada cinsiyetlerin sergilenmesinin acı bir yansımasıdır. Bu cinayetler, sosyal medya aracılığıyla geniş bir kitleye duyurularak toplumsal farkındalık yaratmaktadır. Ancak, bu durum aynı zamanda cinsiyet temelli şiddetin sürdüğü bir toplumda kadınların güvenlik açısından ne kadar dezavantajlı olduklarını göstermektedir. Siber dünya, cinsiyet eşitliği açısından avantajlar sunan bir alan olarak görülmektedir. Bu dijital ortam, cinsiyetler arasında daha eşit bir temsili sağlama potansiyeline sahiptir. Örneğin, emojiiler aracılığıyla her cinsiyetin özel renk ve seçeneklerle temsil edilebilmesi, bu eşitliği destekleyen bir örnektir. Ancak, siber dünyada ataerkil normların hakim olduğu durumlar da gözlemlenebilir, bu da cinsiyet eşitliği çabalarını zorlaştırabilmektedir. Özellikle heteronormatif bakış açılarına odaklanan siber dünya, LGBTQ+ bireyler için dezavantajlar içerebilmektedir. Cinsel yönelim ve kimlik çeşitliliği konusundaki temsiliyetin sınırlı olması, topluluk içinde bu bireylerin görünürlüğünü azaltabilmektedir. Bu durum, siber dünyada cinsiyet eşitliğine yönelik çabaların, belirli cinsel kimliklere odaklanmış olması nedeniyle eksik kalmaktadır.

SONUÇ

Siberfeminizm, özel ve kamusal alan ayrımının siber dünyada kadın ve LGBTQ+ bireyler üzerindeki olumsuz etkilerini vurgulamaktadır. Bilgisayar oyunları gibi dijital platformlarda cinsiyet temsiliinin ataerkil yapısını sürdürmesi, siber dünyadaki eşitsizlikleri derinleştirmektedir. Bu durum, genel dijital içeriklerde de etkili olup, internet üzerindeki sosyal medya platformları, dijital içerik üretimi ve paylaşımı genellikle belirli cinsiyet normlarına ve stereotiplerine dayanmaktadır. Cinsiyet rollerini pekiştiren veya aşındıran içerikler, toplumsal algıları şekillendirmekte ve bireyler arasındaki eşitsizlikleri pekiştirebilmektedir. Özellikle sosyal medya platformlarında kadınların dış görünüşleri üzerinden yapılan değerlendirmeler, vücut normlarına dayalı şiddet içeren yorumlar veya cinsiyetçi şakalar, siber dünyada cinsiyet eşitsizliğini derinleştirmektedir. Evde oyun oynayan bireylerin siber dünyada nasıl şekillendikleri, özel alanlarında nasıl bir denetleme altında oldukları dikkate alınmalıdır. Siber dünyada cinsiyetlerin sergilenmesi konusundaki eşitsizlikleri ele alan bir diğer önemli konu, çevrimiçi şiddet ve tacizdir. Özellikle kadınlar, çevrimiçi platformlarda cinsiyet temelli şiddete maruz kalabilmektedir. Tehditler, hakaretler, cinsel içerikli taciz ve benzeri davranışlar, siber dünyada cinsiyet eşitsizliğini güçlendiren faktörler arasında yer almaktadır. Ancak, bu olumsuzluklara karşı gelişen bir hareket de siberfeminizm olarak adlandırılmaktadır. Siberfeminizm, dijital alanlarda cinsiyet eşitliğini teşvik eden, cinsiyet temelli ayrımcılığa karşı duran ve kadınların dijital alanda daha güçlü bir varlık göstermelerini destekleyen bir perspektifi temsil etmektedir. Bu hareket, teknoloji sektöründeki cinsiyet eşitsizliğiyle mücadele etmek, kadınların dijital alanda daha fazla temsil edilmesini sağlamak ve çevrimiçi şiddeti engellemek amacıyla çeşitli girişimlerde bulunmaktadır. Türkiye, siberfeminizm ve toplumsal tartışmaları etkin bir şekilde ele almadığı gözlemlenmiştir. Akademik makale platformlarındaki taramalarda siberfeminizm konusunda yapılan araştırmaların sınırlı olduğu görülmektedir. Bu durum, siberfeminizm ve siber dünyanın cinsiyetleşmesi konusunda daha fazla araştırma ve çalışmaya ihtiyaç duyulduğunu göstermektedir. Türkiye'de siberfeminizme olan ihtiyacın temel nedeni, dijital platformlarda kadınlara yönelik cinsiyet temelli şiddet olaylarının artmasıdır. Siberfeminizm, bu tür şiddet vakalarına karşı farkındalık oluşturmaya ve

kadınları korumayı amaçlamaktadır. Dijital dünyada da geleneksel dünyada olduğu gibi cinsiyet eşitsizliği devam etmektedir. Siberfeminizm, kadınların dijital alanlarda eşit haklara ve fırsatlara sahip olmalarını savunmaktadır. İnternet içeriği, yazılım geliştirme ve teknoloji sektörlerinde kadınların temsil oranı düşük olup, bu durum siberfeminizmin odak noktalarından biridir. Siberfeminizm, kadınların bu alanlarda daha fazla görünürlük kazanmalarını ve etkileşimde bulunmalarını hedeflemektedir. Türkiye'de siberfeminizme olan ihtiyaç, dijital dünyada kadınların güvenliği, eşitliği ve temsiliyeti için mücadele etmek adına ortaya çıkan sorunların çözümüne yönelik bir strateji olarak öne çıkmaktadır.

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NEW LINGUISTICS AND GRAMMAR TERMS

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ORCID ID: <https://orcid.org/0000-00032557-5567>.**ABSTRACT**

Especially in parallel with the developments in natural sciences and technology, it is inevitable that there will be change and development in language. Since science and technology know no boundaries, the need to create field-specific terminology has arisen in order to meet on a common ground in this direction and to express at least approximately the same things with the same word structures. Eugen Wüster, who is considered to be the founder of the General Theory of Terminology (GTT, General Theory of Terminology), directed his studies as a result of this realisation. Finding a common ground does not mean agreeing on an artificial language such as Esperanto or Volapük, nor does it mean glorifying English by calling it the world language, as is currently the case. The act of deriving terms in order to name developments in industry and technology and to make them field-specific is also reflected in the fields of science. For example, there are dictionaries of linguistics and grammar. Our aim is to introduce and present some little known/unknown terms, which we will derive and propose either earlier or new ones. Several methods will be used in this short study. Our research is qualitative as we aim to reveal the perceptions of linguistic and grammatical terms in a pragmatic setting. It is also a comparative study since we want to achieve our aim by giving examples from German and Turkish. Since we aim to collect information on linguistic and grammatical terms, we will also use the observational survey method. Since we will talk about the problems in terminology, our study is descriptive. Since we derive new terms based on linguistic theories and principles, our method is also theoretical.

Key Words: Linguistics, Grammar, Terminology, Turkish, German.

YENİ DİLBİLİM VE DİLBİLGİSİ TERİMLERİ**ÖZET**

Özellikle doğa bilimlerindeki ve teknolojiadaki gelişmelere paralel olarak dilde de değişim ve gelişimin olması kaçınılmazdır. Bilim ve teknoloji sınır tanımayacağına göre, bu doğrultuda ortak paydada buluşabilmek, aynı sözcük yapılarıyla en azından yaklaşık anlamda aynı şeyleri ifade edebilmek amacıyla alana özgü terminoloji oluşturma ihtiyacı doğmuştur. Zaten Genel Terminoloji Kuramının (GTT, General Theory of Terminology) kurucusu sayılan Eugen Wüster, bu farkındalığının sonucunda çalışmalarına yön vermiştir. Ortak paydada buluşmak, Esperanto, Volapük gibi yapay bir dilde uzlaşmak ya da dünya dili diyerek şimdilerde olduğu gibi İngilizceyi yüceltmek anlamına gelmemektedir. Endüstri ve teknolojiadaki gelişmeleri adlandırmak ve alana özgülaştirmek için terim türetme eylemi bilim alanlarına da yansımıştır. Örneğin dilbilim ve dilbilgisi sözlükleri de mevcuttur. Amacımız, bizim daha önce ya da yeni türetilip önereceğimiz, az bilinen / hiç bilinmeyen bazı terimleri tanıtmak ve ortaya koymaktır. Bu kısa çalışmada birkaç yöntem birden kullanılacaktır. Dilbilim ve dilbilgisi terimleri üzerinde oluşan algıların edimsel ortamda ortaya koyulmasını amaçladığımız için araştırmamız niteldir. Almanca ve Türkçeden örnekler vererek amacımıza ulaşmak istediğimiz için karşılaştırmalı bir

çalışma da sözkonusudur. Dilbilim ve dilbilgisi terimleri konusunda bilgi toplamayı amaçladığımız için gözleme dayalı tarama yöntemini de kullanacağız. Terminolojideki sorunlardan sözedeceğimiz için çalışmamız betimseldir. Dilbilim kuramlarına ve ilkelerine dayalı olarak yeni terimler türettiğimiz için yöntemimiz biraz da kuramsaldır.

ANAHTAR KELİMELEER: Dilbilim, Dilbilgisi, Terminoloji, Türkçe, Almanca.

GİRİŞ

Özellikle doğa bilimlerindeki ve teknolojideki gelişmelere koşut olarak dilde de değişim ve gelişimin olması kaçınılmazdır. Bilim ve teknoloji sınır tanımayacağına göre, bu doğrultuda ortak paydada buluşabilmek, aynı sözcük yapılarıyla en azından yaklaşık anlamda aynı şeyleri ifade edebilmek amacıyla alana özgü terminoloji oluşturma ihtiyacı doğmuştur. Zaten Genel Terminoloji Kuramının (GTT, General Theory of Terminology) kurucusu sayılan Eugen Wüster, bu farkındalığının sonucunda çalışmalarına yön vermiştir (Sandrini 1996). Ortak paydada buluşmak, Esperanto, Volapük gibi yapay bir dilde uzlaşmak ya da dünya dili diyerek şimdilerde olduğu gibi İngilizceyi yüceltmek anlamına gelmemektedir. Bu konuya aşağıda değineceğiz.

Amaç ve Yöntem

Endüstri ve teknolojideki gelişmeleri adlandırmak ve alana özgülaştirmek için terim türetme eylemi bilim alanlarına da yansımıştır. Örneğin dilbilim ve dilbilgisi sözlükleri de mevcuttur. Amacımız, bizim daha önce ya da yeni türetilip önereceğimiz, az bilinen / hiç bilinmeyen bazı terimleri tanıtmak ve ortaya koymaktır.

Bu kısa çalışmada birkaç yöntem birden kullanılacaktır. Dilbilim ve dilbilgisi terimleri üzerinde oluşan algıların edimsel ortamda ortaya koyulmasını amaçladığımız için araştırmamız niteldir.

Almanca ve Türkçeden örnekler vererek amacımıza ulaşmak istediğimiz için karşılaştırmalı bir çalışma da sözkonusudur.

Dilbilim ve dilbilgisi terimleri konusunda bilgi toplamayı amaçladığımız için gözleme dayalı tarama yöntemini de kullanacağız.

Terminolojideki sorunlardan sözedeceğimiz için çalışmamız betimseldir.

Dilbilim kuramlarına ve ilkelerine dayalı olarak yeni terimler türettiğimiz için yöntemimiz biraz da kuramsaldır.

TERİM – KAVRAM - TERMİNOLOJİ

Terim “Bir bilim, sanat, meslek dalıyla veya bir konu ile ilgili özel ve belirli bir kavramı karşılayan“ bir sözcüktür. Ferdinand de Saussura’e dayanan gösterge anlayışına göre bir gösterge (sözcük) „gösteren“ ve „gösterilen“ olmak üzere iki bölümden oluşur. „Gösteren“, harf ya da seslerdir. Gösterilen ise kavramdır, yani bir nesnenin ya da düşüncenin zihindeki soyut ve genel tasarımıdır.¹

Terminoloji ise bilim, sanat, meslek vb. alanlardan birisine özgü sözcüklerin bütünüdür. Sözüni ettiğimiz dallar bu terimler sayesinde söylemek istediğini daha iyi söyler, dinleyici / okuyucu söyleneni / yazılanı daha kolay anlar. Yani ilgili alan çerçevesinde daha kolay iletişim kurulur, daha verimli tartışılır.

¹ <https://sozluk.gov.tr/>

TARTIŞMA: YENİ TERİM TÜRETMENİN GEREĞİ VAR MIDIR?

Hâlihazırda İngilizcede / Almancada vs. oturmuş bir terim varken yeni Türkçe bir terim türetmenin gereği var mıdır? Elbette gereği vardır; hatta bu bir gereklilikten öte, zorunluluktur. Dil ile düşünce arasında çok güçlü bir bağın olduğunu yadsımak olanaksızdır. Çünkü yabancı sözcükler / terimler genellikle duyularla algılanabilen durumlarıyla belleğimizde yer alırken, yerli sözcükler / terimler atalardan, anadan, babadan ve içinde büyüdüğümüz doğadan beslenen ruhsal, kültürel ve duysal süreçlerin birikimini içerir. Yabancı sözcükte dilsel göstergenin “gösteren”i öne çıkarken, anadilinde gösteren ve gösterilen dilin köklerinden beslenir.

Bir insan kendini en iyi şekilde anadilinde ifade eder. Anadili biyolojik annenin dili değil, kişinin en iyi egemen olduğu ve kendini en iyi ifade edebildiği dildir. Dolayısıyla anadilimizin kaynaklarına dayanan bir sözcüğü ya da terimi anlamak için gereken zihinsel çaba, yabancı bir sözcüğü ya da terimi anlamak için gereken zihinsel çabadan çok daha düşüktür. Yani yabancı sözcükler daha fazla zihinsel çaba ve zaman gerektirir. Hatta kültürel öğelerin tam anlaşılması da söz konusu olabilir. Zira anadili yerine göre tarih, din, sosyoloji, felsefe ve birçok yaşamışlıkları içerir.

Termimoloji Sözlükleri

Teknik alanlara özgü birçok terim vardır. Bu sözlüklerin bir bölümü kişiler tarafından, bir bölümü de Türk Dil Kurumu’na yayınlanmıştır. Yabancı kökenli terimlere Türkçe kökenli karşılıklar oluşturma amacı taşıdığı anlaşılan terim sözlüklerinden bazı örnekler verelim. Örnekler TDK sayfasından alınmıştır:²

Ağaçşileri Terimleri Sözlüğü – 1968, Asalakbilim Terimleri Sözlüğü – 1970, Ayaktopu Terimleri Sözlüğü – 1974, Aydınlatma Terimleri Sözlüğü – 1973, Bilgisayar Terimleri Karşılıklar Kılavuzu – 2007, Bilişim Terimleri Sözlüğü – 1981, Bitkibilim Terimleri (Botanik) – 1948, Budunbilim Terimleri Sözlüğü – 1973, Ceza Yargılama Yöntemi Yasası Terimleri Sözlüğü – 1972, Çiftteker Terimleri Sözlüğü – 1970, Dilbilgisi Terimleri Sözlüğü – 1972, Dilbilim Terimleri Sözlüğü – 1949, Dirilbilim (Biyoloji) Terimleri – 1948, Dölerme ve Suni Tohumlama Terimleri Sözlüğü – 2004, Döşem Terimleri Sözlüğü (Su, Gaz, Isıtma, Havalandırma) – 1969, Edebiyat ve Söz Sanatı Terimleri Sözlüğü – 1948, Eğitim Terimleri Sözlüğü – 1974, Ekonometri Terimleri Karşılıklar Sözlüğü, Felsefe Terimleri Sözlüğü – 1975, Fizik Terimleri Sözlüğü – 1983, Fiziksel Kimya Terimleri Sözlüğü – 1978, Gökbilim Terimleri Sözlüğü – 1969, Gösterim Sanatları Terimleri Sözlüğü – 1983, Gramer Terimleri Sözlüğü – 2003, Gümrük Terimleri Sözlüğü – 1972, Güreş Terimleri Sözlüğü – 1974, Güzel Sanatlar Terimleri Sözlüğü – 1968, Halkbilim Terimleri Sözlüğü – 1978, Hayvan Besleme ve Beslenme Hastalıkları Terimleri Sözlüğü – 2004, Hemşirelik Terimleri Sözlüğü – 2015, İstatistik Terimleri Sözlüğü – 1983, Kentbilim Terimleri Sözlüğü – 1980, Kılıçoyunu Terimleri Sözlüğü – 1970, Kimya Terimleri Sözlüğü – 1981, Kitaplıkbilim Terimleri Sözlüğü – 1974, Mantık Terimleri Sözlüğü – 1976, Matematik Terimleri Sözlüğü – 1983, Medenî Hukuk Terimleri Sözlüğü (Osmanlıcadan Türkçeye - Türkçeden Osmanlıcaya) – 1966, Metalbilim İşlem Terimleri Sözlüğü – 1972, Orta Öğretim Terimleri Kılavuzu – 1963, Otomobilcilik ve Motor Bilgisi Terimleri Sözlüğü – 1980, Ruhbilim Terimleri Sözlüğü – 1974, Sepettopu Terimleri Sözlüğü – 1969, Sinema ve Televizyon Terimleri Sözlüğü – 1981, Su Ürünleri Terimleri Sözlüğü – 2007, Tarım Terimleri – 1949, Tarih Terimleri Sözlüğü – 1974, Tecim, Maliye, Sayışmanlık ve Güvence Terimleri Sözlüğü – 1972, Teknik Terimler I (Makina öğeleri. Elektroteknik. Yapı Makinaları, İçten Yanmalı Motorlar, Bastıraklar, Teknibilim, Dayanım, Temel Tekniği, Gereç) – 1949, Tıp Terimleri Kılavuzu – 2010, Tiyatro Terimleri Sözlüğü –

² <https://sozluk.gov.tr/>

1966, Toplumbilim Terimleri Sözlüğü – 1975, Türe Terimleri, Türkçe Hekimlik Terimleri Üzerine Bir Deneme – 1944, Uçantop, Alantopu, Masatopu Terimleri Sözlüğü – 1968, Uygulayım Terimleri Sözlüğü – 1980, Veteriner Hekimliği Tarihi ve Deontoloji Terimleri Sözlüğü – 2004, Yapım İyeliği Terimleri Sözlüğü – 1971, Yapıt Hakları Terimleri Sözlüğü – 1971, Yazın Terimleri Sözlüğü – 1974, Yerbilim Terimleri Sözlüğü – 1971, Yöntembilim Terimleri Sözlüğü – 1981, Yumrukoyunu Terimleri Sözlüğü – 1968, Zooloji Terimleri Sözlüğü – 1963.

BULGULAR: YENİ DİLBİLİM VE DİLBİLGİSİ TERİMLERİ

Burada anılan ve daha önce ya da yeni önerilen terimler, yazar tarafından ilk olarak kullanıldığı varsayılan yerimlerdir. İlklik açısından ilgili terimin Korkmaz (1992), Vardar vd. (2002), Püsküllüoğlu (2002) ve İmer vd. (2011) sözlüklerinde aynı şekilde yer alıp almadığına bakılacaktır. Ayraç içinde her terimin Almancası verilecektir. Terimleri harf sırasına göre değil, içeriğine göre gruplandırmak istiyoruz.

Dilbilim Terimleri

Ağdilbilim (Internetlinguistik): Her türlü mobil ve sabit ağlar üzerinden gerçekleşen yazılı, sözlü, görsel iletişimi dilbilimsel yöntemlerle betimleyen Uygulamalı Dilbilim dalı.

Aykırı Dilbilim (Queere Linguistik): Kadın – erkek karşıtlığına dayanan ikili cinsiyet yaklaşımının gizli ya da örtük bir biçimde doğal tek olguymuş gibi dil yoluyla benimsetilmesini reddeden, ikil cinsiyet, heteroseksüel – homoseksüel vb. kategorileştirmeleri yıkmayı ya da mümkün olduğunca aşmak isteyen, cinsel kimlik oluşturan söylemleri inceleyen, söylem yoluyla insanları sınıflandıran eylemleri kabul etmeyen, dil yoluyla hegemonya kurmanın önüne geçilmesini öngören anlayış doğrultusunda dili betimleyen ve işlevselleştiren Uygulamalı Dilbilim dalı (Balcı 2023a).

Çevredilbilim (Ökolinuistik): Doğa, kültür, dil ve her türlü insan ilişkisinde çeşitliliği ve çoğulculuğu temel alan; büyük, güçlü, ezici, sıradan olana karşı kendini küçük, zayıf, mağdur ve farklı konumlandırıranların yanında yer alan, dilin çevreye yararcılık için işlevselleştirilmesini savunan dilbilim dalı (Balcı 2006).

Futboldilbilim (Fußballinguistik): Futbol ile ilgili dil edimini inceleyen alana „Futboldilbilim“ denir (Balcı 2021).

Spordilbilim (Sportlinguistik): Spordilbilim, bütün spor dallarına özgü dil edimini inceler (Balcı 2021).

İşletme Dilbilimi (Betriebslinguistik): İşletme dilbilimi, gerçekte kazanç amacıyla mal ve hizmet üreten işletmeler ile tüketiciler arasındaki ilişkilerin eniyileştirilmesi, verimin ve niteliğin artırılması, tüketici haklarının korunması gibi pratik konuları dilbilimsel yöntemlerle inceleyen dal (Balcı 2007).

Kurumsal Dilbilim (Institutionelle Linguistik): Kazanç amacı güden ya da gütmeyen her türlü kurum ve kuruluştaki işleyişin daha verimli olabilmesi için dilbilimsel araştırmalar yapan dal (Balcı 2023b).

Kadınışitlikçi Dilbilim (Feministische Linguistik): Cinsiyete bağlı dili betimleyen, kadınların dil edimi yoluyla dezavantajlı duruma düşürülmesinin önüne geçilmesini amaçlayan Uygulamalı Dilbilim dalı (Balcı & Balcı 1996).

Dilbilgisi Terimleri

Türkçenin en sorunlu dilbilgisi terimlerinden birisi “edat”tır. Balcı (2003) gerek Türkçe “edat” gerekse Almanca karşılığı olan “Partikel” terimlerinin çekimi yapılmayan her türlü sözcüğü kapsaması, çok belirsiz ve sorunlu bir içeriğe sahip olması (bak. Deny 1941: 560; Kahraman 1986: 93; Helbig 1990: 19-21; Oruç 1999) nedeniyle, edatın üstkavram olarak kullanılmasını ve şu terimleri kapsamasını önermektedir: ünlem, bağlaç, ilgeç, tümcems, özsözcük, ayırtaç.

Ayırtaç (Modalwort): Türkçede “belirteç” terimi vardır. Ancak bu terimin içerdiği sözcüklerin anlamsal ve sözdizimsel özellikleri farklıdır. Dolayısıyla nesnellik içeren belirteçleri öznel bir bakış açısı ifade eden ayırtaçlardan ayırmak gerekir. Örneğin karar soru tümcelerine ayırtaçla yanıt verilebilir, belirteçle verilemez. Tamamlama soru tümcelerine belirteçler yanıt olabilir, ayırtaç olamaz: Zil çaldı mı? – Galiba (ayırtaç). Zil ne zaman çaldı? Bu tamamlama sorusuna “Galiba” diye yanıt verilemez. Keza “Zil ne zaman çaldı? - Şimdi (belirteç) - Zil çaldı mı? “Şimdi” ile yanıt verilemez (Balcı 2003).

Tümce (Satzäquivalent): Onaylama, reddetme vb. öznel tutumları anlatmaya yarayan, tek başına kullanılabilen, bir tümcenin yerini tuttuğu için tümce değeri olan, bir tümceyle kullanıldığında tümcenin başında veya sonunda yer alan birim (evet, hayır, hay hay, yok, değil)

Özsözcükler (Partikel): Öz biçimi değişmeyen, genellikle kısa, yalın ve bağımsız sözcüksel anlamı zayıf sözcük. Bu birimlerin tümce değerleri yoktur; tamlama / tümleç oluşturamazlar; tümce ögesi değeri taşıyamazlar; ilgi kurucu / bağlayıcı işlev göremezler; tümceden çıkarıldıklarında tümcede sözdizimsel bir yanlışlık oluşmaz; öznel tutum ifade ederler; herhangi bir soruya konu ya da yanıt olamazlar; tümcenin bir bölümüne değil, tümüne gönderme yaparlar; olumsuzlanamazlar (Ali araba almış. – Ucuz mu bari? - Ucuz olsaydı bari! Bari zamanında gel!).

Önilgeç (Präposition): Önüne geldiği ad (tümleç) ile eylem (yüklem) veya ad ile tamlaması arasında ilgi kuran çekimsiz sözcük. (Zengin 2021).

Sonilgeç (Postposition): Sonuna geldiği ad (tümleç) ile eylem (yüklem) veya ad ile tamlaması arasında ilgi kuran çekimsiz sözcük.

İçilgeç / Sarmal ilgeç (Zirkumposition): İlgili olduğu sözcüğü içine alan parçalı ilgeç.

Sözcük Yapımıyla İlgili Terimler

Birkerelik biçimbirim (unikales Morphem): Yalnız bir sözcüğün türetilmesinde görülen yapım eki (Brombeere; sapsarı).

Önekimsi (Präfixoid): Önek niteliği taşıyan, ancak önekleşme sürecini tamamlamamış olan biçimbirim (Kanatlı & Balcı 2000).

Önekleme (Präfigierung): a) Önekle sözcük türetme, b) önekle türetilen sözcük.³

İçikleme (Infigierung): a) İçikle sözcük türetme, b) içikle türetilen sözcük.

Sonekleme (Suffigierung): a) Sonekle sözcük türetme, b) sonekle türetilen sözcük.

Çaprazlama (Wortkreuzung, Amalgamierung): İki sözcüğün bazı parçalarının birbiriyle kaynaştırılmasıyla elde edilen sözcük (belgeç [belge + geç], Datei [Daten + Kartei]).

³ „Önek“ (Präfix), „içek“ (Infix) ve „sonek“ (Suffix) terimleri uzun süredir kullanılmaktadır. Korkmaz’da (1992: 52) bu terimleri „ek“ (Affix) maddesi bağlamında terim olarak değil, söz içinde geçirmektedir: „Dünya dillerinde ekler, kelimedeki eklenme yerlerine göre ön ek, iç ek ve son ek olmak üzere üç türdür. Türkçedeki eklerin hepsi de son ek türündendir”.

Tür değiştirme (Konversion): Biçim değiştirmeden sözcük türünü değiştirme (kız [ad veya sıfat] – kız [sıfat] öğrenci, leben – Leben).

Tersine türeme (Rückbildung): Daha uzun sözcükten daha kısa türeme. „Sanftmut ← sanftmütig“ örneğinde mantıken “sanftmütig” sözcüğü “Sanftmut” sözcüğüne “-ig” son eki getirilerek türetilmiş olmalıyken, durum tersinedir, yani daha eski olan “sanftmütig” sözcüğünden “-ig” atılarak tersine bir türetme yapılmıştır.

Tümce adlaşması (Zusammenrückung): Birden fazla sözcükten oluşan bir tümcenin öğelerini sıkıştırarak / birleştirilerek adlaştırılma (imambayıldı, Rührmichnichtan).

Öbek sözcükleşmesi (Zusammenbildung): Bir sözcük öbeğinin öğelerinin birleşerek yeni bir sözcük oluşturması. Tümce adlaşmasından (Zusammenrückung) farkı, birleştirme yoluyla elde edilen sözcüğün iki ögesinden birisinin sözlük maddesi olmamasıdır. Örneğin Almanca “Er fällt Holz” tümcesinden “Holzfäller”, “blaue Augen” öbeğinden “blauäugig” türetebiliriz. Ancak Almanca sözlükte “Fäller” veya “äugig” şeklinde sözcükler yoktur. Keza Türkçede “Kızın yanakları al” ya da “Onun gözü aç” tümcelerinden “alyanaklı” ve “açgözlü” türetilir, ama eski versiyonlarının tersine Güncel Türkçe Sözlük’ün mevcut sürümünde⁴ “yanaklı” ve “gözlü” maddeleri yer alsa bile bunlar bağımsız biçimbirim olarak kullanılamaz. Yani “Bu adam yanaklı” ya da “Bu kız gözlü” diyemiyoruz (bak. Balcı 2009: 16-17 ve 2013a).

Diğer Dilbilgisi Terimleri

Altlayıcı bağlaç (Subjunktion): Önüne geldiği yantümcenin yüklemine sona atılmasına neden olan bağlaç.

Eşleyici bağlaç (Konjunktion): Önüne geldiği tümcenin yüklemine yerini etkilemeyen bağlaç (Zengin 2023).

Birliktelik durumu (Komitativ, Soziativ, Begleitfall): Korkmaz (1992) “-le” ile yapılan ad durumlarını “vasıta hali” diye adlandırmaktadır. Oysa “Bıçakla kestim” tümcesinde araç / vasıta (Instrumentalis), “Asya’yla evlendim” tümcesinde birliktelik durumu vardır.

Donama eylemi (Ornativum): Daha farklı bir nitelik kazandırmak için süsleme, ekleme, katma anlamı içeren fiil.

İstemsel (valent): İsteme bağlı, istemle ilgili.

İkillik (Dualität): İkili sisteme dayanma durumu.

Yüklemcil (Prädikativ, prädikativ): İstemsel Dilbilgisi kuramı çerçevesinde sözcük türlerinden değil, sözcük türlerinin söz içindeki işlevinden – yüklenme / yüklemcil işlevden – hareket etmeyi ifade eden terim.

SONUÇ

Bilim ve teknoloji dünyasının gelişimi ve değişimi anadiline de yansır. Yabancı dillerdeki teknolojik ve bilimsel terimleri olduğu gibi almak zamanla anadilini köreltir. Dolayısıyla yabancı terimlere Türkçenin köklerinden yararlanarak karşılıklar üretmek bir zorunluluktur.

Bu kapsamda türetilen terimlerin kullanılması ilk bakışta zor gelebilir. Bu tür terimlerin dile yerleşmesi de çok zaman alabilir. Buna karşın dile yeni sözcükler ve yeni terimler kazandırmanın başka yolu yoktur. Türetilen terimleri birer öneri olarak algılamak gerekir. Yapılması gereken şey, toptancı bir önyargıyla beğenilmeyen ya da tutmayan terimleri kötülemek ve reddetmek değil, yerine başkalarını üretmektir.

⁴ <https://sozluk.gov.tr/> (Erişim tarihi: 7.11.2023).

Önerdiğimiz terimlerin bazılarında TDK'ya göre yanlış yazılmış, ancak dilbilimsel gerekçelere dayanarak doğruluğunu savunduğumuz biçimbirimleri (**içek**, **yantümce**, **birkerelik**, **özsözcük**) de son olarak hatırlatmak istiyoruz. Zaten yazım konusu biçimsel unsurlar da içerir (bak. Aksöz 2017; Aksöz & Balcı 2019).

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METHODS OF PSYCHOLOGICAL CORRECTION OF DEVIANT BEHAVIOR

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ABSTRACT

Deviant behavior poses challenges in various societal contexts, necessitating effective interventions to address its underlying causes and mitigate its impact. This article provides a comprehensive review of psychological correction methods employed in the field of deviant behavior. Drawing on a synthesis of existing literature, the paper explores diverse strategies, ranging from traditional psychotherapeutic approaches to contemporary cognitive-behavioral interventions. The article systematically analyzes prominent correctional methods, including behavioral therapy, cognitive restructuring, and psychodynamic approaches. Special attention is given to the role of therapeutic alliances, group interventions, and community-based programs in fostering positive behavioral change. In conclusion, this article synthesizes current knowledge on the diverse methods of psychological correction for deviant behavior, offering insights into their effectiveness and limitations. The findings contribute to a nuanced understanding of the evolving landscape of corrective interventions, providing a foundation for future research and the development of tailored approaches to address the complexities of deviant behavior.

KEYWORDS: Deviant behavior, Psychological correction, Intervention strategies.

SAPKIN DAVRANIŞI PSİKOLOJİK DÜZELTME YÖNTEMLERİ

ABSTRACT

Sapkin davranış, çeşitli toplumsal bağlamlarda zorluklara neden olur ve bunun altında yatan nedenleri ele almak ve etkisini azaltmak için etkili müdahaleler gerektirir. Bu makale sapkin davranış alanında kullanılan psikolojik düzeltme yöntemlerinin kapsamlı bir incelemesini sunmaktadır. Mevcut literatürün bir sentezinden yararlanan makale, geleneksel psikoterapötik yaklaşımlardan çağdaş bilişsel-davranışsal müdahalelere kadar çeşitli stratejileri araştırıyor. Makale, davranışsal terapi, bilişsel yeniden yapılandırma ve psikodinamik yaklaşımlar dahil olmak üzere önde gelen düzeltme yöntemlerini sistematik olarak analiz etmektedir. Olumlu davranış değişikliğini teşvik etmede terapötik ittifakların, grup müdahalelerinin ve toplum temelli programların rolüne özel önem verilmektedir. Sonuç olarak bu makale, sapkin davranışların psikolojik düzeltilmesine yönelik çeşitli yöntemler hakkındaki mevcut bilgileri sentezleyerek, bunların etkililiği ve sınırlamalarına dair içgörüler sunmaktadır. Bulgular, düzeltici müdahalelerin gelişen ortamının incelikli bir şekilde anlaşılmasına katkıda bulunarak gelecekteki araştırmalara ve sapkin davranışların karmaşıklığını ele alacak özel yaklaşımların geliştirilmesine bir temel sağlıyor.

INTRODUCTION

The complexity of the behavior of individuals within society causes deviations to emerge from time to time and the need for effective interventions to correct these deviations. In this context, psychological correction methods of deviant behavior include various strategies aimed at understanding the underlying causes of the individual's behavioral deviations and mitigating this effect. This article provides an overview of the psychological correction processes of deviant behavior.

Beginning by examining the theoretical foundations of deviant behavior, the article emphasizes the multifacetedness of the origins of this behavior, highlighting the importance of understanding individual differences and adapting interventions to specific contexts. Focusing on the main principles of psychological correction, the study systematically analyzes prominent correction methods including behavior therapy, cognitive structuring and psychodynamic approaches.

The article places special emphasis on the role of therapeutic bonds, group interventions, and community-based programs in promoting positive behavioral change. It also addresses the integration of innovative techniques such as virtual reality therapy, neurofeedback, and technology in the field of psychological correction. The potential benefits, challenges, and ethical considerations of these evolving methods are also discussed.

In conclusion, this article synthesizes existing knowledge covering various methods of psychological correction of deviant behavior, providing insight into the effectiveness and limitations of these interventions. The findings provide a foundation for the evolving landscape of corrective interventions, providing the basis for future research and the development of approaches specific to the complexities of deviant behavior.

THEORETICAL FOUNDATIONS OF DEVIANT BEHAVIOR

Deviant behavior refers to actions, behaviors, or conduct that significantly deviate from established social norms, cultural expectations, or legal standards within a given society. Deviant behavior, characterized by actions that significantly diverge from social norms, is a complex and multifaceted phenomenon. Understanding its theoretical foundations is crucial for unraveling the complexities associated with its origins and manifestations (Fritzsche, 2005). Social learning theory, pioneered by Albert Bandura, posits that individuals acquire deviant behaviors through observational learning and modeling. The influence of significant others, such as family, peers, and media, plays a pivotal role in shaping behavioral patterns (Akers, Jensen, 2010).

Strain theory, developed by Robert K. Merton, suggests that deviance arises from the disjunction between societal goals and the means available to achieve them. When individuals face obstacles in attaining culturally prescribed success, they may resort to deviant means (Huck, et.al., 2017). Labeling theory, associated with Howard Becker, contends that societal reactions and labels contribute to the development and perpetuation of deviant identities. Individuals labeled as deviant may internalize these labels, leading to a self-fulfilling prophecy (Bernburg, 2019).

Control theory, as articulated by Travis Hirschi, emphasizes the role of social bonds and attachments in preventing deviant behavior. Strong social bonds, such as family and community ties, act as deterrents, reducing the likelihood of engaging in deviant acts (Hirschi, 2015). Biological theories explore the influence of genetic, neurological, and hormonal factors on deviant behavior. Psychological perspectives, including personality disorders and mental health issues, contribute to our understanding of individual predispositions toward deviance (Kikalishvili, 2016).

Cultural deviance theory highlights the impact of subcultures and cultural norms on deviant behavior. It asserts that certain communities may develop their own set of values and norms, diverging from mainstream society and fostering deviant acts (Costello, 1997). Routine activity theory, proposed by Lawrence E. Cohen and Marcus Felson, suggests that the convergence of motivated offenders, suitable targets, and the absence of capable guardianship creates an environment conducive to deviant behavior (Miller, 2013).

PRINCIPLES OF PSYCHOLOGICAL THERAPY

Psychological therapy, often referred to as psychotherapy or counseling, is a collaborative process between a trained mental health professional and an individual or group. The goal is to explore, understand, and address emotional, behavioral, and cognitive challenges. Therapists strive to cultivate empathy and understanding, creating a safe and nonjudgmental space where clients feel heard and validated (Grawe, 2004). This empathetic connection forms the foundation for a therapeutic alliance.

Confidentiality is a cornerstone of ethical psychological therapy. Therapists are bound by professional standards to protect the privacy of clients, ensuring that information shared during sessions remains confidential, with exceptions limited to situations of imminent harm or legal obligations. Clients are viewed as active participants in their own healing process. Therapists collaborate with clients to set goals, develop treatment plans, and make decisions, respecting the autonomy and agency of the individual (Weiner, Bornstein, 2009).

Therapists are committed to cultural competence, recognizing and respecting the diversity of clients. This includes an understanding of cultural influences on mental health, adapting therapeutic approaches to align with cultural backgrounds, and fostering an inclusive environment. Psychological therapy is guided by empirical research and evidence-based practices. Therapists integrate scientifically validated approaches to maximize the effectiveness of interventions, continually updating their skills based on the latest research (Evans, 2013).

Therapists are committed to providing services that are free from discrimination based on factors such as race, ethnicity, gender, sexual orientation, religion, or socioeconomic status. Inclusivity is central to creating a therapeutic environment that respects and values diversity. Therapy is often goal-oriented, with therapists and clients collaboratively establishing specific, measurable, achievable, relevant, and time-bound (SMART) goals. Regularly revisiting and adjusting these goals ensures progress and direction in the therapeutic process (Richards, Suckling, 2008).

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Behavior Therapy

Behavior therapy offers a structured and goal-oriented approach to addressing deviant behavior by focusing on observable actions and systematically implementing interventions. The process begins with a thorough behavioral assessment to identify and define specific deviant behaviors, considering factors such as frequency, intensity, and context. Collaboratively establishing clear

and measurable goals for behavior change becomes a foundational step, aiming to replace undesired behaviors with more adaptive alternatives (Wahler, et.al., 2007).

Positive reinforcement is a key principle in behavior therapy, involving the introduction of rewards or positive consequences to encourage the occurrence of desired behaviors. Conversely, negative reinforcement addresses factors contributing to deviant behavior by removing or addressing aversive stimuli. Appropriate consequences, such as punishment, are implemented to discourage the occurrence of deviant behaviors, associating them with negative outcomes. Extinction, on the other hand, involves withholding reinforcement for undesired behaviors to reduce their frequency (Goode, 2022).

Modeling plays a crucial role in behavior therapy, where therapists demonstrate and encourage prosocial behaviors as alternatives to deviant actions. Integrating cognitive-behavioral interventions allows for the examination and modification of underlying thoughts and beliefs associated with deviant behavior, contributing to lasting change. Token economies, involving the exchange of tokens for rewards, and behavior contracts, outlining expected behaviors and consequences, provide structured frameworks for behavior modification (Ghasemi, et.al., 2023).

For deviant behaviors rooted in anxiety or fear, systematic desensitization is a useful technique. It gradually exposes individuals to triggers while teaching relaxation techniques to manage associated emotions. The ultimate goal of behavior therapy is to ensure that the learned behaviors generalize to various settings and are maintained over time (Magnavita, 2006). This involves practicing and reinforcing positive behaviors in real-life situations, contributing to meaningful and sustainable behavior change tailored to the individual's needs and circumstances.

Cognitive Configuration

The connection between cognitive configurations and deviant behavior delves into the intricate realm of thought processes, beliefs, and cognitive frameworks that either contribute to or result from behaviors straying from societal norms. When examining cognitive configurations in the context of deviant behavior, one must consider how individuals perceive, interpret, and make sense of their experiences, as these cognitive processes significantly influence their actions. Cognitive distortions, characterized by irrational and biased thought patterns, often play a role in the development of deviant behavior (Su, et.al., 2022). These distortions, such as black-and-white thinking or catastrophizing, can distort perceptions and contribute to negative emotions that may drive individuals towards engaging in behaviors deemed deviant by societal standards. Moreover, maladaptive beliefs, deeply ingrained notions about oneself and the world, can underpin deviant behavior. These beliefs, often formed early in life, influence decision-making processes and shape responses to various situations, potentially steering individuals toward actions that deviate from accepted norms.

Cognitive scripts, mental frameworks guiding behavior in specific situations, and schemas, core beliefs about the self and the world, also contribute to deviant behavior. Established cognitive scripts may support or justify deviant actions, becoming ingrained patterns that reinforce the behavior over time. Deviant behavior can sometimes be a consequence of impaired decision-making processes rooted in cognitive factors. Distorted thinking or cognitive biases may hinder individuals from fully considering the consequences of their actions, making them more susceptible to engaging in behaviors considered deviant (Chen, et.al., 2022). Furthermore, deviant behavior may serve as a maladaptive coping mechanism for dealing with cognitive

distress, emotional pain, or unresolved issues. Individuals may turn to deviant actions as a way to escape, numb emotions, or gain a sense of control over their circumstances. In the cognitive-behavioral model, thoughts, emotions, and behaviors are intricately interconnected. Interventions that target cognitive restructuring become crucial for promoting behavior change. By addressing distorted thinking patterns and challenging maladaptive beliefs, cognitive-behavioral therapies work towards promoting healthier cognitive configurations and, consequently, reducing or preventing deviant behaviors.

The influence of cognitive factors, such as self-efficacy and motivation, cannot be understated. Low self-efficacy or an external locus of control may contribute to a lack of motivation to adhere to societal norms, potentially influencing individuals to engage in behaviors considered deviant. Lastly, cognitive configurations are not developed in isolation but are shaped by social interactions and observational learning. Deviant behavior may be learned and reinforced through cognitive processes such as imitation, modeling, and the internalization of deviant norms within certain social groups. Understanding the cognitive dimensions of deviant behavior is essential for designing effective interventions (Kaylor, Jeglic, 2022). By addressing cognitive patterns and promoting healthier thought processes, interventions contribute to the reduction or prevention of deviant behaviors, fostering positive cognitive configurations and adaptive responses to the challenges of daily life.

Psychodynamic Approaches

Psychodynamic approaches to understanding deviant behavior delve into the intricate realms of unconscious motivations, unresolved conflicts, and early life experiences that may underpin behaviors deviating from societal norms. Rooted in Freudian psychoanalytic principles, these perspectives posit that deviant actions may be driven by unacknowledged desires, repressed emotions, or unconscious urges that individuals may not fully recognize or openly express. Childhood experiences and the quality of early attachments are significant focal points in psychodynamic perspectives, with disruptions in early relationships or traumatic experiences contributing to the development of maladaptive coping mechanisms (Kovalenko, Oleksandra, 2022).

Defense mechanisms, according to psychodynamic theory, play a pivotal role in managing internal conflicts, and deviant behaviors may serve as unconscious defense mechanisms protecting individuals from anxiety, guilt, or other distressing emotions associated with unresolved psychological conflicts. The tripartite structure of personality—comprising the id, ego, and superego—offers a framework for understanding how imbalances or conflicts within these components may contribute to deviant behavior, with the id representing primal urges, the ego mediating between reality and desires, and the superego internalizing societal norms (Daniels, Farley, 2022).

The concept of repetition compulsion, introduced by Freud, posits that individuals unconsciously repeat patterns of behavior to reenact and resolve unresolved conflicts from the past. In this context, deviant behaviors may be a form of repetition compulsion aimed at mastering or gaining control over past traumas. The psychodynamic therapeutic process involves exploring transference and countertransference dynamics, shedding light on the individual's interpersonal relationships and unresolved issues that may contribute to deviant behavior (Ayapbergonova, 2022).

Furthermore, psychodynamic perspectives suggest that deviant behaviors may carry symbolic meaning, representing unmet needs, desires, or conflicts. Analyzing the symbolic nature of deviant actions becomes a key component in uncovering underlying psychological processes. Psychoanalytic treatment, often associated with psychodynamic approaches, employs

techniques such as free association, dream analysis, and exploring resistance to bring unconscious content to awareness. By doing so, individuals may gain insight into the root causes of their deviant behavior and work towards psychological healing (Daniels, Farley, 2022). While psychodynamic perspectives may not offer a comprehensive explanation for deviant behaviors, they provide valuable insights into the complex interplay of psychological factors contributing to their manifestation.

THERAPEUTIC ALLIANCES AND GROUP INTERVENTIONS

Therapeutic alliances involve the development of a trusting and collaborative relationship between the individual and the therapist. In the context of deviant behavior, a strong therapeutic alliance is crucial for fostering openness, honest communication, and a sense of safety. The therapist serves as a supportive guide, helping individuals explore the root causes of their deviant behavior, confront challenging emotions, and work towards healthier coping mechanisms (Papalia, et.al., 2022). The alliance provides a foundation for self-reflection and encourages individuals to actively engage in the therapeutic process, contributing to the effectiveness of interventions.

Group interventions bring individuals with similar struggles or deviant behaviors together in a supportive and structured environment. This approach capitalizes on the dynamics of group interactions, creating a sense of belonging and shared experience. Group members can provide mutual support, empathy, and encouragement, fostering a community where individuals feel understood and accepted. Group interventions often incorporate elements such as psychoeducation, skill-building exercises, and interpersonal feedback. The group setting allows individuals to learn from one another, gain different perspectives, and practice new behaviors within a supportive context (Lochman, et.al., 2023).

Group interventions harness the power of peer support, offering individuals the opportunity to share their experiences, receive feedback, and learn from the successes and challenges of others. This shared understanding can reduce feelings of isolation and stigmatization associated with deviant behavior. Both therapeutic alliances and group interventions contribute to normalizing the experiences of individuals facing deviant behavior. Understanding that others share similar struggles can reduce shame and encourage a sense of universality, promoting a non-judgmental atmosphere that facilitates change (Hoogsteder, et.al., 2022).

In a group setting, individuals can observe and learn from each other's coping strategies, problem-solving approaches, and positive behavioral changes. This social learning aspect is particularly valuable in addressing deviant behavior, as it provides concrete examples of alternative ways of thinking and behaving. Group interventions often incorporate skill-building components that empower individuals to develop and practice new coping skills (Papalia, et.al., 2022). These skills may include effective communication, conflict resolution, and stress management, which are essential for addressing the underlying issues contributing to deviant behavior.

Therapeutic alliances and group settings create opportunities for constructive feedback and mutual accountability. Individuals can receive input from both the therapist and their peers, fostering a sense of responsibility for their actions and encouraging commitment to the therapeutic process. By combining therapeutic alliances and group interventions, individuals facing deviant behavior can access a comprehensive and supportive framework for change. These approaches recognize the importance of both individualized support and the collective

strength derived from shared experiences, ultimately contributing to positive outcomes and sustained behavioral change (Lochman, et.al., 2023).

CONCLUSION

In conclusion, the exploration of methods of psychological correction for deviant behavior reveals a diverse and nuanced landscape where various therapeutic approaches play a crucial role in fostering positive change. Theoretical foundations, such as social learning theory, strain theory, and cognitive-behavioral perspectives, provide valuable frameworks for understanding the root causes of deviant behavior and guiding intervention strategies.

The utilization of behavior therapy techniques, including positive reinforcement, negative reinforcement, and cognitive restructuring, offers practical tools to modify observable behaviors and address distorted thought patterns associated with deviance. These methods emphasize the importance of goal-setting, individualized treatment plans, and evidence-based practices to promote lasting behavioral change.

Therapeutic alliances and group interventions emerge as powerful vehicles for transformation, creating supportive environments where individuals facing deviant behavior can explore their challenges, share experiences, and develop essential coping skills. The integration of cultural competence ensures that correction methods are sensitive to diverse backgrounds, acknowledging the impact of cultural factors on behavioral patterns.

Ethical considerations remain at the forefront of psychological correction efforts, emphasizing the importance of confidentiality, client autonomy, and the well-being of individuals undergoing corrective interventions. The continuous evolution of innovative technologies and evidence-based techniques further expands the horizons of psychological correction, offering new avenues for intervention and support.

In the ever-evolving landscape of psychological correction for deviant behavior, the synthesis of theoretical foundations, practical interventions, and ethical considerations fosters a comprehensive and holistic approach. By recognizing the complexity of deviant behavior and tailoring correction methods to individual needs, the field of psychological correction continues to contribute significantly to the well-being and positive transformation of individuals navigating the challenges of deviance.

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**ASSESS THE IMPACT OF SEDENTARY HABITS AND PHYSICAL ACTIVITY
LEVELS ON SPINAL CURVATURE PARAMETERS IN YOUNG ADULTS WITH
POSTURAL DISORDERS AND TO VERIFY THE INFLUENCE OF TIME SPENT
PASSIVELY ON THE PARAMETERS OF THORACIC KYPHOSIS AND LUMBAR
LORDOSIS**

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ABSTRACT

Small individual deviations from normal posture can lead to a syndrome of postural abnormalities defined as a postural defect. It is estimated that these disorders can affect 60 to 80% of the population. Inactivity, most often associated with increased hours spent sitting, will also affect developmental trends. According to research, nowadays people can spend more than 60% of their 16-hour waking time in a sedentary position. This trend is particularly dangerous for children, adolescents and young adults. Postural abnormalities and complications of spinal postural defects in young adulthood can affect deterioration of health, decline in functional ability and locomotion, and the development of skeletal diseases in later years of life.

Assess the impact of sedentary habits and physical activity levels on spinal curvature parameters in young adults with postural disorders and to verify the influence of time spent passively on the parameters of thoracic kyphosis and lumbar lordosis.

This cross-sectional observational study involved 51 adults women and men with postural disorders (Caucasians of European origin) aged 22.9 ± 1.09 years from the metropolitan areas capital. The study was approved by the Bioethics Committee and conforms to the Declaration of Helsinki. The shape of the curvature of the spine was examined using the Zebris Pointer CMS10 system. A posture analysis was performed and parameters defining postural disorders were evaluated. The measurements of the kyphosis (TK) and lordosis angle (LL) of the spine, scoliosis deformity (SD) and lateral deviation (LI) of the trunk were analyzed by computer examination. To assess the angle of trunk rotation (ATR) in the transverse plane, a test was performed using a Bunnell scoliometer. Physical activity (PA) and sedentary time was assessed in a face-to-face interview conducted by an experienced interviewer using the International Physical Activity Questionnaire – Short Form (IPAQ-SF). The levels of PA were adopted using the WHO Guidelines on Physical Activity and Sedentary Behavior.

In conclusion, sedentary behaviour and physical activity are important modifiable determinants of body posture in young Caucasian adults of European origin. These studies have shown that regardless of gender, the longer the average sitting time in hours/day, the greater the risk of thoracic kyphosis disorders. The longer the time spent sitting, the higher the risk of decreased lumbar lordosis in men and women. In women, an average sit time of more than 7h significantly increased the risk of hyperlordosis. The results expand the knowledge of the multifactorial determinants of body posture in young adults.

KEYWORDS: body posture, sedentary behavior, ZEBRIS system, physical activity.

**THE CONCEPT OF KTS® (POL. KOMPENSACYJNA TERAPIA SKOLIOZ, ANG.
COMPENSATORY THERAPY OF SCOLIOSES - CTS) - A NEW MODEL OF
THERAPY FOR PATIENTS WITH SCOLIOSIS**

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ABSTRACT

Idiopathic scoliosis is a three-plane deformation of the spine. Its unknown etiology limits cause-and-effect treatment.

There are many methods and methods of treating patients with scoliosis, which differ in principles. Such methods include the FITS method, which comes from Poland, and the FED method, from Spain. When comparing both methods, differences in the effectiveness of therapy were observed. They mainly concerned the impact of therapy on primary and secondary arches and on total trunk rotation, i.e. on the parameters summarizing posture tests, which are still little known in the diagnosis of scoliosis.

The effect of therapy on specific scoliotic arches may vary. The phenomenon of their formation is described by a compensation mechanism that determines the position of the head above the pelvis and the formation of compensatory arches. The FITS method uses a positive compensation mechanism as a decrease in rotation in the main arch with a simultaneous tendency to increase it in compensatory arches, or with an extension of the primary arch as a result of the therapy. The topic of the compensation phenomenon is discussed in scientific studies.

However, the formation of secondary distortions may become a serious clinical problem for the patient. There is also no guarantee that the primary arch will be corrected by increasing the secondary arch, especially since the FED method has been shown to improve all arches and overall trunk rotation among patients with idiopathic scoliosis.

By reversing the compensation mechanism, we create the phenomenon of reducing both primary and secondary arcs. The phenomenon of the reverse compensation mechanism was used to create a new view on the conservative treatment of patients with idiopathic scoliosis. The KTS ® concept (Compensatory Therapy for Scoliosis) is a new look at the mechanics of therapy and is an alternative to treatment with other methods.

KEYWORDS: idiopathic scoliosis, KTS concept, compensatory therapy of scolioses, compensation mechanism, FITS method, FED method.

USING NON-MARKOVIAN DYNAMICS TO UNVEIL THE MECHANISM OF EFFECTIVE COVID-19 VACCINATION STRATEGY

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ABSTRACT

In the context of the COVID-19 pandemic, effective vaccine allocation strategies are crucial due to limited global vaccine supply and the emergence of mutant strains. This study aims to address this issue by focusing on the prioritization of vaccines within a non-Markovian framework, taking into account the significant roles played by asymptomatic and symptomatic transmission in the disease spread. To achieve this, a comprehensive age-stratified compartmental model was developed and calibrated using clinical and epidemiological data. Based on outbreak prediction within the non-Markovian framework, an effective vaccination strategies were proposed. These strategies outperformed other empirical vaccine prioritization approaches by minimizing cumulative infections, cumulative deaths, and years of life lost due to the pandemic. Interestingly, the study findings revealed that solely administering vaccines to a selected age group led to a rapid decline in prevention efficiency. This suggests that the commonly adopted strategy of continuously vaccinating high-risk groups may not be effective. Through mathematical analysis of the model, the underlying mechanism of dynamic effective vaccine allocation was uncovered. It was highlighted that allocating vaccines to combinations of different age groups is necessary for achieving effective prioritization. This research provides valuable insights for countries and regions facing vaccine shortages, offering guidance for their vaccine allocation strategies. Additionally, it establishes a theoretical and modeling framework for effective prioritization, serving as a basis for empirical application in real-world scenarios. Furthermore, the study's findings contribute to the understanding of vaccine allocation strategies in the face of mutant strains, further enhancing preparedness for future challenges.

KEYWORDS: disease transmission, epidemic control, non-Markovian framework.

**ASSESSING THE APPLICABILITY OF MARKOVIAN MODELING FOR
TRANSIENT MEMORY-DEPENDENT EPIDEMIC DYNAMICS****Mi Feng**

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ABSTRACT

The initial phase of an emerging epidemic plays a crucial role in developing data-driven models, predicting epidemic trends, and devising effective control strategies. However, incorporating memory-dependent models for real-world epidemics presents challenges in terms of data collection, parameter estimation, computation, and analysis. In contrast, traditional Markovian models do not encounter these difficulties. Currently, there is great interest in understanding the conditions under which Markovian and non-Markovian models are equivalent for transient epidemic dynamics. In this study, we introduce a comprehensive computational and analytic framework that demonstrates the equivalence between transient states in Markovian and non-Markovian models when the average generation time matches the average removal time. This equivalence minimizes estimation errors in key metrics such as the basic reproduction number, epidemic forecasting, and evaluation of control strategies within the Markovian framework. Importantly, these errors depend solely on the ratio of generation-to-removal times, rather than the specific values and distributions of these times. This characteristic has the capability to facilitate estimation that is more applicable across different scenarios. Our findings establish a general criterion for modeling memory-dependent processes using memoryless Markovian frameworks. By understanding this criterion, researchers can effectively utilize Markovian models to study and analyze transient epidemic dynamics, leading to improved prediction of disease transmission and enhanced decision-making in epidemic control.

KEYWORDS: disease transmission, epidemic control, non-Markovian dynamics, nonlinear dynamics, dynamical equivalence.

SIMULATION MODEL OF A SINGLE-PHASE INVERTER USING SPWM UNIPOLAR TECHNIQUE

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ABSTRACT

This paper presents the simulation of a single-phase inverter using sinusoidal pulse-width modulation (SPWM) unipolar technique. The circuit has been simulated using the Matlab/Simulink program. As a switch, the Insulated Gate Bipolar Transistor (IGBT) has been used. The three major elements of single-phase inverter circuits are the inverter part, which consists of an IGBT switch, the control circuit, that creates switching pulses, and the filter part, which includes inductors, capacitors, and resistors to reduce harmonic. The total harmonic distortion (THD) of a single-phase inverter is significantly influenced by the modulation index. By adjusting the modulation index, the amplitude of the output voltage waveform can be controlled, which directly affects the spectral distribution of harmonics in the output signal. By reducing THD, it is possible to improve the power quality by eliminating the harmonics that are present in the inverter output voltage. Through the use of the SPWM technique, the operational efficacy of a single-phase inverter is investigated in this research. The results of the simulation show the output of the sine wave with the output voltage of 220 V and 50 Hz.

KEYWORDS: Single-Phase Inverter, SPWM, LC Filter, THD.

OSTEOSARCOPENIA IN POSTMENOPAUSAL CAUCASIAN WOMEN: CROSS-SECTIONAL OBSERVATIONAL STUDY

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ABSTRACT

Osteosarcopenia is a newly described syndrome. Osteosarcopenia is the co-existence of osteoporosis and sarcopenia, two chronic musculoskeletal conditions associated with aging. Osteoporosis is a systemic skeletal disease characterized by loss of bone mineral density and bone microstructural integrity and a high risk of fractures. Sarcopenia is a multisystem disease, which predisposes to muscle weakness and frailty. The etiology of osteosarcopenia is multifactorial, with mechanical, biochemical, genetic, and lifestyle factors all contributing to the involution of the bone-muscle unit.

The cross-sectional observational study aimed to evaluate the prevalence and risk factors of osteosarcopenia among 300 postmenopausal Caucasian women from Poland.

Bone mineral density and bone mineral content of the femoral neck and lumbar spine and muscle mass were assessed by dual-energy X-ray Absorptiometry (Norland XR-46, Swissray-USA, Norland Medical Systems, Madison, WI, USA). Hand grip strength (HGS) was measured using a dynamometer (Hydraulic Model Jamar). Functional fitness was assessed by the short physical performance battery, the daily pace assessment, timed get-up and go and the 6-minute walking test. Physical activity was examined by the Yale Physical Activity Survey (YPAS-PL). The energy expenditure (kcal/week) was estimated by summing the time of each activity multiplied by the corresponding intensity code. Eating habits, consumption of dairy products, and protein intake were calculated from face-to-face interview data and Food Frequency Questionnaires (FFQ).

The highest percentage of osteosarcopenia was in women with the lowest level of physical activity (PA) and high sitting time. Energy expenditure, protein intake, and total time PA (hours/week) were significantly higher in healthy women without osteosarcopenia. Consumption of dairy products during the day significantly lowers the risk of osteosarcopenia among women. Systematic participation in physical exercises with a high osteogenic index, such as Pilates, nordic walking, gymnastics, and resistance exercises significantly reduced the

risk of osteosarcopenia. Lifestyle, especially physical inactivity and sedentary behavior, significantly affect the risk of developing osteosarcopenia.

KEYWORDS: osteosarcopenia, physical activity, sedentary behaviors, eating habits, postmenopausal women, Caucasian women, aging.

THE ROLE OF PARENTAL INVOLVEMENT IN MANAGEMENT OF BEHAVIOURAL PROBLEMS IN CHILDREN WITH INTELLECTUAL DISABILITY DURING HOME-BASED LEARNING ENVIRONMENT IN THE MODERN INCLUSIVE SOCIETY

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ABSTRACT

The present study explores the role of parental involvement in the management of behavioural problems in children with intellectual disability (CwID) during a home-based learning environment in the modern inclusive society. Managing behavioural problems is an essential component of rehabilitation for children with ID. This study suggests that parents play an essential role in children with ID change in behavioural modification initiatives at home-based learning environments. The majority of children with ID have behavioural problems, and their needs are diverse. Everyone who deals with children who have ID mostly focuses on helping them learn to overcome their adaptive behaviour limitations. Children with ID may find it challenging to get used to the home-based learning environment in the modern, inclusive society. The major goal of anybody working with children who have ID should be to help them learn to overcome adaptive behavioural conditions. They might be challenging for parents to manage at times. At the heart of effective behaviour management is the ability of parents to provide a safe and structured school environment that promotes learning. Managing a classroom full of children with ID, interests, and behaviours might be an interesting challenge. Children with ID will do better in school once they know their part to play in a home-based learning environment in the modern inclusive society. Something is wrong when a person's issue or disruptive behaviour hinders their ability to participate in other people's activities, acquire new abilities, or improve their existing ones. In an inclusive society, children's behavioural problems are best handled when they actively carry out classroom behaviour management measures. Parents who work with children with special needs ensure that all of their children adhere to the same behavioural standards while also making adaptations to meet their specific needs. Thus, the methods of behaviour control that typical parents in an inclusive society could employ are the primary emphasis of this field. Parental involvement in behaviour modification programs is vital for the success of these endeavours since parents always want what's best for their children with ID in the home-based learning environment in the modern inclusive society.

KEYWORDS: Role, Parental Involvement, Management, Behavioural Problems, Children with Intellectual Disability, Home-based Learning, Modern, and Inclusive Society.

Introduction

A parent's involvement is essential to their child's learning, whether at home or in school (Jeynes, 2005). Emotional and behavioural problems are more common in children with ID. However, there is a shortage of information on targeted treatments for these issues in ID

children. Several things parents may do at home can help their children learn, such as maintaining a positive attitude about school, engaging in age-appropriate play with their children, being there for them in all ways, and creating a warm and inviting home environment. Children whose parents prioritize education are more likely to succeed academically (Greenwood & Hickman, 1991). The unique understanding of their child's needs makes parents the best decision-makers and champions for children with ID, as per Lo (2010). According to Suresh (2012), several nations' recent educational expansions have increased the significance of parental involvement. Problematic behaviours associated with mental and behavioural disorders can be observed as early as three years old, according to Velders et al. (2011). The need for parental involvement is becoming more apparent to families coping with ID children (Balli, 2016; Lo, 2010).

Managing behavioural problems among children with ID may be challenging in communities with inadequate resources. The efficacy of the behavioral intervention in contexts with few resources was the major focus of the study. When behavioral and emotional problems first appear in childhood, they tend to be more severe as adults (Morgan et al., 2009). These disorders tend to either remain stable or deteriorate over time. Many factors, including family dynamics, school atmosphere, and relationships between instructors and students with ID in inclusive classrooms, might influence the onset of these illnesses in a modern, inclusive society. Having parents who are actively involved in their lives has numerous positive effects on children with ID, including positive effects on their behavior and academic performance, according to reports. Organizations from both the public and commercial sectors need to work together to reach out to parents about this. A parent's primary goal should be to produce a morally decent child. For persons with ID to fully recover, it is essential to address their behavioral problems. Schools offer behavioral management programs to all students with ID, irrespective of whether they are in a normal or special education class. Because they are not in school, most children with ID in the country who act out do not get the formal care they need (Lakhan, R., 2013). Studies show a strong relationship between parental involvement and children's behavior, social skills, academic achievement, and attendance (Lendrum et al., 2015; Šukys et al., 2015). Maintaining children with IDs safe, providing intellectual challenges, having meaningful conversations, modelling positive social and educational values, encouraging big dreams, and being involved in their children's education are all important ways for parents to help their children with ID in the home-based learning environment in a modern, inclusive society.

Students with Intellectual Disability

Children with ID, also known as cognitive impairments or mental retardation, have a significantly diminished capacity for intellectual functioning and adaptive behaviours. This includes conceptual, social, and practical adaptive skills. Before these issues manifest themselves, which is before the age of 18, support services become vital. ID is defined by a lack of usual cognitive and adaptive abilities and an excessive demand for assistance with everyday tasks (Schalock et al., 2010). ID is a complex genetic condition with a wide variety of symptoms, including problems with adaptive behaviours and cognitive function; as an outcome, people who have ID greatly benefit from having strong support systems throughout their lives. Since ID is often a modest disability, people with it often acquire new things more slowly than the typical person. Most people can become self-sufficient adults with the correct academic assistance.

On the contrary, students with significant disabilities may not be able to attend school regularly due to the ongoing medical care and nursing that is required to meet their supplemental medical

needs. School performance and academic advancement are both impacted by the child's health problems (Groce et al., 2011). When thinking about how ID might affect the world's new-born population, the richness and diversity of developmental patterns cannot be emphasized enough (Guralnick, 2005). Learning by doing, effective social interaction, and conceptual understanding are the three main indicators of ID. Enhancing children's reasoning and creative thinking skills in the home-based learning setting is essential for children with ID to succeed in a modern, inclusive society.

Students with ID may require help with daily living tasks and adaptive behaviours. Eating and clothing are only two areas where these adolescents typically require assistance. A person may also have trouble or a delay in developing their voice, have explosive outbursts, forget things easily, and have trouble connecting their activities with the outcomes they achieve. Anxiety, impaired motor skills, seizures, mood disorders, disorganization and lack of coherence in writing and speech, problems with hearing and vision, and profound or severe ID are among the health issues that can accompany these conditions (American Association on Intellectual and Developmental Disabilities, 2010). Identity is given to individuals when they exhibit problems in specific domains of mental functioning, speech, self-care, social skills, or a combination of the two. A pupil will not pick up knowledge at the usual rate because of these restrictions. Learning to walk, converse, and manage their basic needs (such as feeding and dressing) may take longer for children with ID. Since learning takes longer than usual, children can have trouble at school. It can be challenging for children with ID to learn social and adaptive skills, such as how to take care of themselves, communicate, and connect with others. Parental involvement is essential for children to thrive academically and overcome these obstacles. Remember that their lack of competency hurts the fundamental mental and intellectual skills needed for learning. I would be happy to let you know about this. Children with ID tend to do better in school when their parents are actively involved, based on study (Luckasson, 2013). The idea that ID makes people nervous in social situations is often disregarded. According to studies, children with mild to moderate ID may enhance their intellect and adaptability with the correct therapy and support. As per the standards research, ID is better described as a thinking sickness than a learning disease because thinking is the foundation of learning in a modern, inclusive society.

Behavioural Problems in Children with Intellectual Disability

Behavioural problems are more common in children with ID. The presentation of a person's behavioural problems may vary with age, sex, and intelligence. The children's emotional and behavioural problems were evaluated based on the reports made by their teachers. Nearly one-third of the ID children with additional impairments did not experience a higher likelihood of behavioural problems. Interventions that assist parents as well as teachers in dealing with the rising number of behavioural and mental health issues in children should be a top priority. The devastating impacts on academic achievement, social competency, and peer connections cause a great deal of emotional suffering for impacted children and their families. Those who suffer from ID may find it challenging to control their actions. Children with ID often exhibit problematic behaviours, which might hinder their ability to express themselves fully (Beiersdorf, 2002). When compared to girls, there were more boys with antisocial, disruptive, and egocentric characteristics. Compared to children with mild or moderate ID, those with severe or profound ID were more likely to display behavioural issues. Some of the symptoms that children with ID may have include an anxiety disorder, trouble speaking, a lack of empathy, and antisocial behaviours. According to the study, highly atypical patterns of behaviours or mood suggest potentially harmful actions. Aggression is three to seven times more in ID

compared to typically developing individuals, according to Dworschak, Ratz, and Wagner (2016). Caretakers of the child and members of the community experience great anxiety due to challenging behaviours, which are characterized by disordered emotions and acts that cannot be explained by developmental delay (Einfeld & Tonge, 1995). Ten to fifteen percent of people with ID display problematic behaviours, such as aggression, damaging property, and harming themselves (Emerson, 2003). Applying positive or negative reinforcement to bring about the desired outcome (reduced bad behaviours) is the foundation of operant conditioning, the science of behavioural modification. Using these methods, they can learn new things and control their challenging behaviours at home. Many kinds of behaviours modification strategies can help children with ID in a modern, inclusive society.

Behavioural problems were more common in children with severe or profound ID compared to those with mild or moderate ID. Children with milder impairments exhibited antisocial behaviour, whereas those with more severe impairments showed symptoms of anxiety and speech difficulties. Among the signs exhibited by children with severe ID was a lack of emotion and behaviours similar to autism. Compared to people with cerebral palsy, those with epilepsy performed higher on measures of overall behaviour. Anxiety was less common in children who were able to move around more freely, but behavioural problems and loneliness were more common in children who were unable to do so. Molteno et al. (2001) found that non-verbal children scored higher on every sub-scale except those measuring disruptive behaviour. Minor occurrences may cause significant effects.

In contrast to people with cerebral palsy, persons with epilepsy are more prone to have an accurate appraisal of themselves. When given more freedom to explore, the children's anxiety levels dropped, but when they were confined, they acted out more and experienced more loneliness. All subscales, except disruptive behaviour, were adequately completed by children with language problems. In children with ID, disruptive behaviour can be minor or severe. Problematic behaviour can range from subtle disruptions that make fitting into the group to more extreme actions that could land you in hot water with the law, says Biersdorf (2002). People with ID often resort to aggressive behaviour to attract attention, as per Rowland and Treece (2000). Beyond that, it is a way for them to show how they feel, whether bored, frustrated, helpless, or just plain unhappy. Misbehaviour in the classroom can affect both the delivery of instruction and the comprehension of course content. The general public tends to think that children with ID struggle emotionally and behaviourally. Because of these problems, the family's financial status and children's academic performance suffer. Students with ID may need help to engage in class due to their unique academic and behavioural needs. This might make lesson preparation more challenging. Examining two modern approaches to education, it seeks to shed light on the difficulties with behaviour inherent in working with students who have ID. We hope students will come away with a general grasp of these ideas. Teaching strategies and behavioural requirements may need to be modified so that children with ID can understand and retain the information. Anyone with trouble learning a new language or who learns best visually would do well to take on this simple task. Every child, even those with ID, would gain from schools' core academic and behavioural goals in a home-based learning environment in a modern, inclusive society.

Parental Involvement in the Education of Children with ID

Children with ID typically need supplemental and repetitive lessons; hence, parental participation may enhance and augment their school education (Hsieh et al., 2012). When parents get involved, their children are more likely to assist their children in retaining and

applying what they learn in school (Emerson, 2012; Fear, 2012). Parents with school-aged children can get involved in their children's classrooms in two ways. Parental involvement in their children's education is linked to improved academic achievement (Dixon, 1992). Parents' involvement in their children's education is highlighted by Epstein (2001). Parents are vital in providing valuable information about their children's academic achievements and challenges at home. Thus, they must be active in their children's education when they have ID (Hsieh et al., 2012). Hsieh, Rimmer, and Heller (2012) found that children's physical, social, and cognitive development may be significantly impacted when parents actively do it at the right moments. Also, seeing their parents persevere through tough times is a great way for children to pick up resilience qualities. No matter their skill level, the involvement of parents shows the complex nature of their activities that influence their children's learning and development (Epstein, 2009). This engagement includes what happens in class and outside of it. Parents may be active at home by helping with homework, reading aloud, having important discussions about what they are learning in school, providing study tools, and ensuring regular self-care. Parents can be involved in school-based involvement in many ways, including volunteering, going on field excursions, attending meetings, communicating with teachers and administrators, and even casting a ballot on school-related issues (Ngwenya, 2010; Ibrahim, 2012; Patrikakou, 2005). Children with ID may have challenges with eating, dressing, speaking, and moving about regularly. Overcoming low self-esteem, despair, and feelings of incompetence is challenging for many people. Children with LD suffer far behind their usually developing classmates regarding learning and understanding. The author of the study argues that teachers should not micromanage classroom instruction. Instead, parents should be proactive in their children's lives by giving them direction and advice. As per Green (1996), there are many ways in which early coaching could aid academic success for children with ID in a modern, inclusive society.

In 1992, parents who want to be involved in their children's schools may have two options. The most fundamental kind of assistance is just being physically present for another person while they are suffering. Nothing you have done will matter when the time comes to move on. Regardless of how uninvolved they seem, parents are still expected to be present at school functions. Additional time, resources, and information may be required before assistance can be provided. Wanat had her papers appear in 1992. Some parents may find it quite scary to visit their children's schools. All of their claims are unfounded. Finally, consider the degree to which parents trust the institution's protocols. The effect is far more pronounced when neither parent has finished high school, according to research by Dixon (1992) and Vandergrift and Greene (1992).

The inverse may be correct if the parent does not care how well their child does in school. The authors Vandergrift and Greene state in a 1992 article that parents ought to make their children's education a top priority. Studies found that parents' involvement in their impaired children's education was correlated with their socioeconomic position. Their parents may greatly influence the academic and social achievement of children with ID. Parental involvement is essential for children with ID to complete functional skill training. How they spend their life has an instant and enduring influence on younger generations. Parents should take an active role in their children's education and training. Parents can be as involved as they choose to be. It is a legal requirement that parents be included in their child's IEP. Whether through early intervention, home programs, or outreach, parents' involvement in their children's education usually leads to greater outcomes (Newman, 2005). Parental involvement is often sought at several points, including identification, evaluation, educational programming, training, instruction, and assessment. Parents with more education may be able to notice disabilities sooner. According to the research, parental involvement in their children's ID education was

associated with better academic achievement and learning outcomes. It is crucial for parents to feel empowered to advocate for their children with ID at school and have a say in choices that impact them. In addition, they should react to school invites instead of ignoring them. When parents feel that funding their impaired child's education is a misguided investment, they fulfil their responsibility in the modern, inclusive society.

Home-Based Education for Students with Intellectual Disability

Its approach to providing services to the community relies heavily on the Home-Based Educational Program. Students with severe ID or neurological problems often participate in home-based education programs that combine conventional classroom teaching with alternative learning settings to help them become self-sufficient. Some parents opt to educate their children with ID at home after they reach school age, around seven to fifteen years old. Programs for home-based learning can start whenever the school division decides it is appropriate, either before or after the mandatory school age. Home-based education aims to help children with ID prepare for school and life. Alternate learning settings provide excellent opportunities to acquire and hone social, vocational, and life skills. Significant ID is the inability to perform two or more activities: manners of eating, communication, motor skills, basic social skills, and self-grooming. Some children with ID may thrive with extensive support services available in a mainstream classroom. In contrast, others may have been provided with a pre-integration program to aid their learning at home, so it is important to consider each child's unique child when deciding whether to include them in a mainstream school.

However, some ID students have such severe impairments that they require a customized educational program, which is usually out of reach for most schools right now. There is still a long way to go before school at home becomes a practical choice for children in India. However, it might serve as a temporary fix for uncommon instances. Teachers and lawmakers are divided on the issue since it contradicts the ideals and objectives of home-based education. However, we must keep sight of the reality that it can sometimes work to our advantage (Punia et al., A., 2014). Home-based learning complements traditional schooling that allows school-aged children to get their education in the comfort and familiar environment of a family. Family Compared to traditional schooling, the pedagogical approaches taken by home-schooling families are more flexible and adapted to the unique requirements of each student. These strategies may be used with any adult, be it a parent, a private teacher, or a virtual learning environment. There is a wide variety of approaches to studying at home. Informal education complies with certain regulations as an alternative to home-schooling, which is more regimented and follows an exacting curriculum. Since a home-based learning environment is naturally less regimented and more flexible, limitations were created to allow parents many choices while imposing too much pressure on them.

Regarding the plan, parents must watch their children. Students with ID have much freedom in deciding what they want to do outside of school. Home-based education might still be an option even with the event because of developments in integrated learning and lesson plans that accommodate students' learning environments. Students with ID may finish assignments with the help of adaptive learning methods. Students with ID benefit from course monitoring since it enhances their learning experience. In a modern, inclusive society, the parent and module teacher can work together to bring the classroom into the home-based learning environment. As per the home-based education policy, it is now officially recognized that parents have the right and the duty to teach their children with ID in the sanctuary of their homes. Some parents' philosophical beliefs lead them to choose a home-based learning program for their children

with ID. Parents often teach their ID children at home for very good reasons. More proof that the federal government cares about every child's education is that the program's schools enrol home-schooled youngsters. Schools and parents might find helpful guidelines in the home-based education policy in the modern, inclusive society.

Parental Involvement in Behavioural Management of Children with ID

Policymakers and educators are looking for ways to get parents involved in the education of their children since it has a positive effect on students' academic development (Newchurch, 2017). According to Glavin (2002), disruptive student behaviour is the biggest threat to classroom instruction, and other parts of students' least students' discipline issues and negative peer effects might result from disruptive student behaviour. One approach to being a companion is simply being present for another person. Other options include talking, reading, eating, and even taking vacations together. Assist children with ID in developing moral judgment by setting a good example. Young children with ID acquire fresh skills by watching and mimicking their parents. Their most influential co-workers are those with whom they spend the most time on their duties. Playing, encouraging, talking, and listening to things that interest children with ID are all great ways for parents to show their children the ropes and provide an encouraging role model. These actions are frequently an effort by children with ID to address the issue in a non-problematic way, whether due to boredom, an overly challenging or simple chore, or a need for adult attention. Rather than dealing with issues after they have occurred, the ideal behaviour management approach is to plan to prevent them. The amount of parental engagement affects students' academic achievement in the classroom (Wilder, 2014). As per McNeal (1999), when parents have a role, they form social interactions based on rules of duty, trust, and reciprocity. As per this school of thought, the involvement of parents is a valuable form of social capital. As per McNeal, this approach encourages parents to be involved not only in their children's children but also in the lives of their schools and other parents. The general public tends to believe that parents will benefit from their investments in their children's teachers' car teachers. Parents do anything to enhance their child's behaviour and say that they are involved (McNeal, 2014). There is a significant gap between theory and practice, which could be explained by parents' different levels of involvement in behaviour modification, even though the academic performance of students with ID is improving with time in the modern, inclusive society.

Schools gain a lot when parents actively participate in their children's education; it enhances the home-based environment, makes parents happy, and helps students with ID succeed. Educational institutions can construct partnership programs that boost parental and community involvement by creating, assessing, and enhancing efforts in this area. Home-based learning, socializing, volunteering, decision-making, and community service are just a few ways parents can be involved in their children's education and practitioners agree that parent involvement in elementary education, defined broadly as parents' actions and behaviours related to children's academic, socioemotional, and behavioural outcomes of low-income students at risk for poor achievement. However, the situation worsens when learners with intellectual disabilities are concerned. Behaviour monitoring mudslinging by parents of learners with intellectual disabilities was quite imperative as learners with intellectual disabilities more often than not present with behaviour, consequently making this theme extremely important. The parents mentioned that they watched their children constantly and stated that sometimes their children would engage in bad behaviour, for instance, spitting food, breaking household items, or crying uncontrollably for no known reason. Parental intervention and involvement can also set the stage for students with ID to develop and use coping skills that make them more resilient to problems. This, thus, necessitates the need for parents to play a bigger role in managing their children's children, which would consequently lead to enhanced educational outcomes in an inclusive society. Every family needs to have a parent that is interested and helpful. The intellectually disabled children under their care play a key role as role models, advocates, teachers, and parents. Caring for children with ID requires a deep understanding of it. The development and improvement of a troubled youngster depend on its unwavering hope and

continuous support. Active participation in daily activities and drawing on personal experience are two ways parents can help their children with ID learn to regulate their behaviour in a modern inclusive society.

Conclusion

New, hopeful dreams and goals for your children are probably on your mind as a parent. Sacrifices for entertainment, education, and quality family time would be made by parents who genuinely desire to provide for their children. Lack of parental involvement in their children's children affects their moral development, whether voluntary or not. Students whose parents are actively engaged in their schooling are more inclined to aim high in all areas of life, including schoolwork. When children of any age experience parental conflict, they are far more prone to act antisocially. For children with ID to thrive, parental involvement is crucial. Children value their parents' while going through tough times. The hope is that all children have fun, pick up valuable life skills like respect, empathy, and self-control, and have happy, fulfilling lives as adults. Parental roles are vital. Parents who are highly involved in their children's children expose them to harmful influences that could hinder their ability to realize their full potential. Their future well-being and success prospects improve when parents intervene to prevent their children from misbehaviour. The importance of parental involvement in their children's children has recently come to the forefront of concerns voiced by parents of children with ID. A child's development and future success are heavily influenced by how their caregivers deal with difficult situations, make decisions, and respond. A parent's love and determination are fully displayed when they accept their child's illness to help them learn to live with it. Despite this encouraging setting, many parents still need to provide for their impaired children from the time they are born. Any one of many disabilities, from the mildest to the most severe, can significantly impact a child's ability. Despite the problems that parents experience, educators must find techniques to keep them involved in their children's home-based learning environment in the modern, inclusive society.

The importance of parental involvement in their children's extracurricular activities needs to be communicated more clearly. The continuation of after-school activities depends on parents taking a more active role in their children's children to better understand ID and its effects by helping others. Making tailored programs for these ID students will empower them to rely less on others when they grow up. Using simple, direct Language will ensure that your point is understood. Their basic needs should be met, and they should be allowed to make their own choices when it is in their best interest. A higher likelihood of small infractions is associated with inappropriate behaviour in children with ID, which can be a sign of other mental and behavioural disorders. The home-based learning environment and parental choices are major contributors to many of the problems that modern children with ID encounter. Most of their problems stem from their childhood. Many parents have new and bright hopes for their children's children. When parents take an active role in their children's education, it creates a chain reaction that helps their children succeed in school and life. It seems that when relationships with parents are broken, people of all ages are far more prone to act antisocially. According to experts, their families greatly impact on children's self-esteem. Determinations made by parents and the role played by parents in the home-based education environment for children with ID demonstrate behavioural problems in a modern inclusive society.

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MOBILE TECHNOLOGY APPLICATION IN SMART AGRICULTURE

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ABSTRACT

Governments around the world are developing policies to benefit from the benefits of Industry 4.0 in agriculture, educate farmers, increase product yield and quality, minimize costs and increase incomes. Considering the increasing population and food needs, it seems that the transition from traditional agriculture to modern agriculture is of great importance. Hydroponics is a popular alternative in soilless cultivation, and many studies show that plants grown with hydroponics can be grown with high efficiency and low cost. With the help of automation or automatic control, a process or procedure can be carried out independently of humans or with minimal human assistance. Today, there is no area where automation systems are not used, regardless of the complexity of the process to be performed. The complexity of automatic control can vary from simple on-off control with a single output to high-level algorithms with multiple variables. Within the scope of this study, the hydroponic system is controlled with the help of a computer-aided program called soft-plc and input and output units. The control system measures parameters that are important for plant growth, such as temperature, humidity and pH, in real time with the help of sensors, and with the help of control algorithms and output control signals that it runs in line with user-defined parameters, it activates / deactivates environmental equipment such as pumps and heaters, making them suitable for plant growth. constitutes the conditions. The aim of the study is to develop a mobile interface for an automatic hydroponic automation system. With this system, it is possible to create recipes that control important environmental factors that affect plant growth, such as temperature and humidity. The application stores and visualizes target parameters such as temperature and cycle time used in the automation system and the values measured by the automation system. These values constitute a source for additional intelligent systems that will make calculations such as cost calculation and growth forecast. Thanks to the work carried out, location-independent access, inspection and intervention to the control system via mobile environment is provided, control recipes and measurements can be collected and analyzed in real time and efficiency optimization is provided.

KEYWORDS: Automation, IoT, Mobile Application, Hydroponics.

AKILLI TARIMDA MOBİL TEKNOLOJİ UYGULAMASI

ÖZET

Dünya üzerinde birçok devlet endüstri 4.0'ın nimetlerinden tarımda faydalanmak, çiftçileri eğitmek, ürün verimi ve kalitesini arttırmak, maliyetleri en aza indirmek ve gelirleri artırmak için politikalar geliştirmektedir. Artan nüfus ve besin ihtiyacı dikkate alındığında geleneksel tarımdan modern tarıma geçişin büyük önem arz ettiği görülmektedir. Topraksız tarım yetiştiriciliğinde hidroponik popüler bir alternatiftir ve yapılan birçok çalışma hidroponik ile yetiştirilen bitkilerin yüksek verim ve düşük maliyet ile yetiştirilebildiğini göstermektedir.

Otomasyon veya otomatik kontrol yardımı ile bir işlem veya prosedürün insan bağımsız yâda minimum insan yardımı ile gerçekleştirilebilir. Günümüzde yerine getirilecek işlemin karmaşıklığından bağımsız olarak otomasyon sistemlerinin kullanılmadığı alan kalmamış durumdadır. Otomatik kontrolün karmaşıklığı tek bir çıkışlı basit açma-kapama kontrolden çok değişkenli yüksek seviyeli algoritmalara kadar değişebilir. Bu çalışma kapsamında hidroponik sistem soft-plc olarak adlandırılan bilgisayar destekli bir program ve giriş çıkış üniteleri yardımı ile kontrol edilmektedir. Kontrol sistemi sıcaklık, nem ve ph gibi bitki büyümesi için önemli olan parametreleri sensörler yardımı ile gerçek zamanlı olarak ölçmekte ve kullanıcı tarafından tanımlı parametreler doğrultusunda çalıştırdığı kontrol algoritmaları ve çıkış kontrol sinyalleri yardımı ile pompa, ısıtıcı gibi çevre ekipmanlarını aktif / pasif yaparak bitki büyümesi için uygun şartları oluşturmaktadır. Çalışmanın amacı, otomatik hidroponik otomasyon sistemi için mobil arabirim geliştirilmesidir. Bu sistem ile, sıcaklık, nem gibi bitki büyümesini etkileyen önemli çevresel faktörleri kontrol eden reçeteleri oluşturabilmektedir. Uygulama otomasyon sisteminde kullanılan sıcaklık, çevrim süresi gibi hedef parametreleri ve otomasyon sistemi tarafından ölçülen değerleri depolar ve görselleştirir. Bu değerler maliyet hesabı, büyüme tahmini gibi hesaplamaları yapacak ek akıllı sistemler için kaynak oluşturmaktadır. Yapılan çalışma sayesinde kontrol sistemine mobil ortam üzerinden konum bağımsız erişim, denetleme ve müdahale imkânı sağlanmakta, kontrol reçeteleri ve ölçümler gerçek zamanlı toplanarak analiz edilebilmekte ve verimlilik optimizasyonu sağlanmaktadır.

ANAHTAR KELİMELELER: Otomasyon, IoT, Mobil uygulama, Hidroponik.

DIGITAL MARKETING IN THE AGRICULTURAL SECTOR AND DIGITAL TRANSFORMATION IN AGRICULTURAL MARKETING

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ABSTRACT

Digital marketing is a new component of marketing that uses online-based digital technologies with internet technology, such as computers, smartphones and other technological tools and digital platforms, to promote products and services. The concept of digital marketing, which started to be used in the 1990s, has been on the rise in the business world worldwide, especially towards the mid-2010s. Digital marketing offers unique opportunities for the agricultural sector to access the market. The marketing mix in presenting agricultural products to the market should be created taking into account the characteristics of the agricultural sector. Digital marketing can provide advantages for farmers such as promoting agricultural products and increasing preferability and sales through various digital marketing techniques. Businesses in the agricultural sector continue to carry out their activities by using a combination of traditional and digital marketing tools to ensure customer satisfaction. This study discusses the various factors that will lead to this along with the benefits that will arise if farmers successfully implement digital marketing in the agricultural sector. The study includes articles obtained from different literature platforms using verified keywords. Articles are reviewed to investigate digital marketing in the agricultural sector and the factors influencing the digital transformation of agricultural marketing. The study suggests that for the successful implementation of digital marketing techniques in the agricultural sector, businesses should focus on digital transformation. The study draws the attention of parties to digital marketing and digital transformation in the agricultural sector. An overview of the scopes and benefits of using digital marketing techniques in the agricultural sector; It is primarily a guide for farmers, researchers interested in agriculture and other stakeholders in the sector. Using digital marketing techniques in the agricultural sector can help farmers gain superiority in price determination and reduce production and marketing costs of agricultural products. For this, farmers should be encouraged to prefer digital marketing tools in agricultural marketing and policies should be developed by policy makers for the development of digital marketing in agriculture.

KEYWORDS: Agricultural marketing, Digital marketing, Agricultural sector, Digital technology, Strategy.

INTRODUCTION

The critical role that agriculture plays for economic development and needs to be strengthened with information and communication technologies to ensure food security; Thus, productive technology-oriented and globally competitive agricultural production will be achieved (Pakdemirli et al., 2021). The rapid increase in the world population in recent years brings about a nutritional problem, and in order to reduce this problem, agricultural production must be increased by 70% (Ertaş, 2020). It also causes problems such as environmental pollution caused by agricultural production, destruction of forests, unbalanced fertilizer use, and soil erosion (Kılavuz and Erdem, 2019). The agricultural sector needs new approaches to grow more efficiently, more environmentally friendly, sustainable, and smarter based on knowledge,

innovation and technology (Ertaş, 2020). Therefore, it is imperative to use technology in the agricultural sector. Use of technology in agriculture; Agriculture 4.0 systems are the digital transformation of the agricultural sector. Agriculture 4.0 applications are used in agricultural activities such as land classification, irrigation systems, fertilization, harvesting, greenhouse cultivation, plant and animal practices, yield estimates, and groundwater mapping (Ercan et al. 2019).

With the application of technologies such as precision agriculture, smart farming and digital twin, farmers and producers can act data-driven to make the right decisions and optimize production processes (Sevli, 2023). The use of sensors and artificial intelligence technologies that transmit real-time data helps improve the quality of products by allowing farmers to receive live data and feedback from the production field (Beck, 2020). In addition to improving production processes, digital farming practices also help reduce food waste and increase food safety. Using technologies such as blockchain, artificial intelligence, cloud computing and IoT, producers and consumers can better see the movement of products through the distribution channel and monitor the conditions of farms in real time (Sevli, 2023). This improved traceability in the food supply chain helps ensure food safety. Digital platforms and tools can be used to market and sell agricultural products directly to consumers, reduce the need for intermediaries, increase income potential, and increase the efficiency and sustainability of agricultural businesses (Şalvarlı, 2023). For example, digital agricultural technologies can help collect, analyze and apply agricultural data. Studies are shown in the literature (Table 1).

Table 1. Studies in the Literature

Autors	Research purpose
Pakdemirli et al., 2021; Ertaş, 2020; Ercan et al., 2019; Kılavuz & Erdem, 2019; Sevli, 2023; Beck et al., 2020; Aydın, 2022; Gövez, 2023; Tutkunca & Haydar, 2022; Kökhan, 2021; Dertli & Dertli, 2023; Erdiñç & Aydınbaşı, 2021; Gerdan et al., 2020; Aldağ et al., 2018; Seth & Ganguly, 2017; Kapur, 2018; Qin et al., 2022; Abdullah & Samah, 2013; Yadav et al., 2021; Khan et al., 2021; Van Vliet et al., 2015; Willer & Lernoud, 2017; Dethier & Effenberger, 2012; Fafchamps & Minten, 2012; Fafchamps & Minten, 2012; Collier & Dercon, 2014; Parisi et al., 2015; Aker, 2011; Juma, 2015; Abebaw & Haile, 2013;	Digital technologies & agricultural sector
Bojkić et al., 2016; Han et al., 2022; Stupina et al., 2021; Juswadi et al., 2020; Reddy, 2021; Behera et al., 2015; Ogbeide-Osaretin & Ebhote, 2020; Du et al., 2023; Alekhina et al., 2019; Deichmann et al., 2016; Xiao et al., 2021; Tomala, 2022; Borisova et al., 2020; Alavion & Allahyari, 2012; Ali & Xia, 2022; Xiao et al., 2021; Nugroho, 2021; Balkrishna & Deshmukh, 2017; Kohls & Uhl, 2002; Schipmann & Qaim, 2011; Atli, 2023; Reganold & Wachter, 2016;	Agricultural sector, digital technology, marketing
Aker, 2010; Nazlioglu et al., 2013; Luo & Ji, 2018; Goyal, 2010; Bates, 2014; Keyder & Yenil, 2011; Du et al., 2011; Tomek & Kaiser, 2014; Trienekens, 2011; Nazlioglu & Soytaş, 2012; Karlan et al., 2014; Irwin & Sanders, 2011; Donaldson & Hornbeck, 2016; Stephens et al., 2018; Angelsen, 2010; Perkins, 2017; Vermeulen et al., 2012; O'Lakes, 2013; Rahbar & Wahid, 2011; Barrett, 2010; Şalvarlı, 2023	Agricultural marketing

METHOD

The main purpose of the article is to help the reader understand digital marketing in the agricultural sector and the factors that are effective in the digital transformation of agricultural

marketing. Regarding this, a systematic analysis method has been proposed by nominating important databases such as Web of Science, Scopus and Google Scholar. Systematic review; It is a comprehensive synthesis of similar research by structuring it to determine the best research evidence (Karaçam, 2013). The systematic analysis method has been preferred in many studies (Bikbov et al., 2020; Corbet et al., 2019; Sepanlou et al., 2020; Ballantine et al., 2021; Murray et al., 2022; Vos et al., 2016; GBD, 2017, 2016, 2022; Correction Naghavi et al., 2015; Liu et al., 2016; Nichols et al., 2019; Fitzmaurice et al., 2017; Liyanage et al., 2015; Wang et al., 2022; Johnson et al., 2019; Dorsey et al., 2018). The article research framework (Figure 1) is structured in this way. The stages of the systematic analysis method (Atlam et al., 2020) are shown (Figure 1).

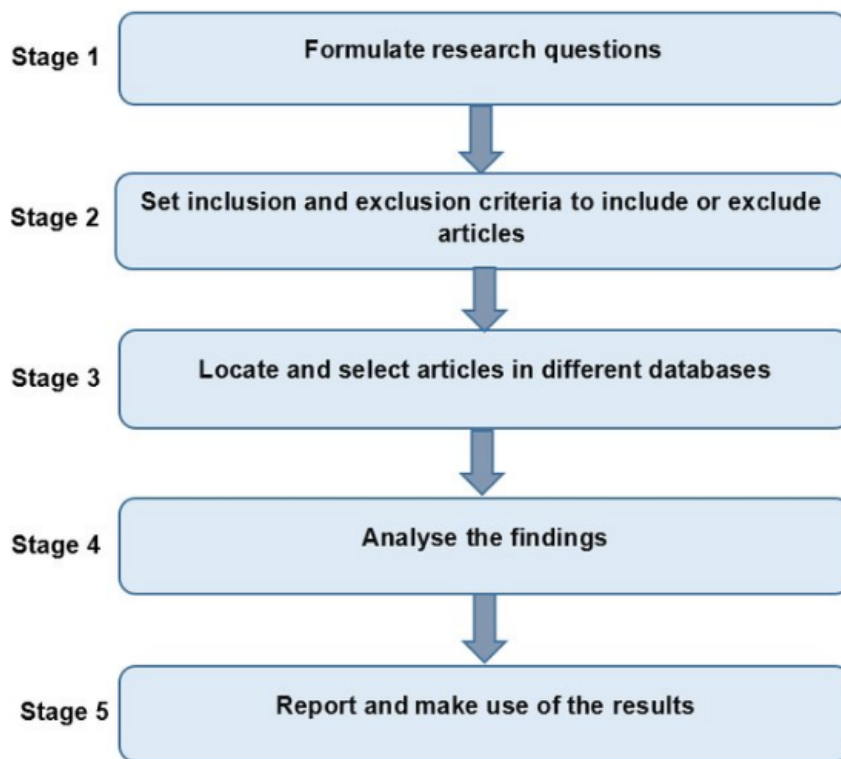


Figure 1. Systematic analysis stages

RESEARCH AND FINDINGS

Investments in infrastructure and technology are needed to increase productivity in agriculture, along with supporting small farmers and promoting sustainable agricultural practices that support their equal access to land, technology and markets (Pakdemirli et al., 2021). Thus, competitive production and thus food safety can be ensured. In market conditions where diversity increases, competition intensifies and borders disappear, the mainstay of sustainable production emerges as Research-Development and innovation (Pakdemirli et al., 2021). While digital agriculture increases productivity, efficiency and profitability through the use of technology, it also includes applications such as precision agriculture, smart irrigation, remote sensing, drones and big data analytics: Such agricultural practices can help farmers save resources, reduce waste and increase crop yields (Şalvarlı, 2023).

The aim of Agriculture 4.0 is to introduce digital solutions that will help farmers become more efficient and productive and production more sustainable. Agriculture 4.0; It consists of many different digital technologies, including sensor technology, robotics and automation, artificial

intelligence and big data analysis (Sevli, 2023). In particular, smart agriculture offers real potential for sustainability and an increase in agricultural productivity based on the most efficient and precise use of resources (Aydın, 2022). These technologies help farmers by providing them with real-time data and information that can be used to make more informed decisions about their farming operations.

Internet of Things (IoT) technology connects physical objects in the real world to the digital world. Sensors measure features of the natural world, quantify characterization information, and send the information to the receiving party (Aydın, 2022). For example, sensors placed on agricultural lands can measure the PH value, humidity, precipitation and temperature of the land in real time. These data records could be the key to system control. Data collected by sensors is the most important part of agricultural big data and the main source of data mining analyzes (Aydın, 2022).

RESULTS

With the introduction of technologies such as wireless communication technologies, artificial intelligence, communication between machines (M2M), cloud systems, and the internet of things (IoT) into our lives, the increasing use of mobile devices has taken its place in the agricultural sector (Aydın, 2022). These technologies have initiated digital transformation in agriculture. Digital tools can be used to track agricultural products and optimize their marketing and distribution (Şalvarlı, 2023).

Digitalization should be seen as a set of tools to support a holistic transformation in the entire food supply where soil is protected, organic matter increases, diversification brings livestock and crops together, diversity is increased, nutrient loops are closed and inputs are minimized (Aydın, 2022). Social media and other digital marketing strategies can be used to promote sustainable agriculture and educate consumers about the benefits of sustainable agricultural practices (Şalvarlı, 2023). Digital transformation in the agricultural sector and agricultural marketing requires a comprehensive assessment of the impact of technologies. Additionally, education and training programs can be organized and collaborative platforms can be created to help farmers use information and resources effectively (Şalvarlı, 2023). This research can also be a reference for experts, researchers and academicians working on the agricultural sector, agricultural marketing.

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WATCHING THE SPATIAL CONTEXT OF MIYAZAKI MOVIES FROM ISTANBUL: A STUDY OF JAPANESE VERNACULAR HOUSES IN ANIME ARCHITECTURE

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ABSTRACT

People and space interact in many ways. The lifestyles can shape the spatial context and vice versa. Architectural design and how individuals convey their connection to space can be altered differently. Hayao Miyazaki's anime stories are well-known for their architectural narratives and profound socio-spatial contexts upon space and people. The unique depiction of spatial qualities in Japanese vernacular architecture can preserve multiple meanings of the context daily life of individuals, as well as the story being filmed.

For example, the portrayal of space in 'Spirited Away' reflects the contrast between the spiritual realm and a symbolic representation of societal hierarchy and labor dynamics. This is exemplified by the architectural depiction of a bath in a ghost town. The confined space of an airship in 'Castle in the Sky' and the vastness of the sky in 'Porco Rosso' influence the characters' behaviour, social hierarchies and cultural interactions. The rural landscapes of My Neighbour Totoro and Princess Mononoke also represent the interdependent relationship between man and nature. They reflect the spatial qualities of traditional Japanese architecture. Miyazaki's films demonstrate a multifaceted approach to spatial narrative. The settings, both in the city and in the countryside, are characterised by unique spatial qualities and architectural styles. Through the application of spatial theory and the examination of everyday social flows, it seems it can be possible to gain a deeper perspective on Miyazaki's depiction of space, architecture and individuals, and to understand the interplay between the individual and space.

This paper aims to answer the research question: How do spatial qualities and social metaphors in architectural visual narratives shape the experiences of individuals within spaces? The methodology of the paper is based on qualitative research. A survey was conducted to research individuals' interaction with Miyazaki's spatial narrative of Japanese vernacular architecture. 107 university students from Istanbul between the ages of 18 and 21 took part in the survey. Frequency Analysis sheds light on the socio-spatial dimensions within Miyazaki's cinematic universe. It provides insights into social dynamics, cultural complexities, and enhances architectural understanding of urban sociology and cultural dynamics.

KEYWORDS: Spatial context, Japanese vernacular architecture, Hayao Miyazaki, socio-spatial interaction, anime film narrative, Istanbul.

EFFECT OF HYDROSTATIC PRESSURE ON ELECTRONIC PHASE TRANSITIONS IN MONOLAYER VS₂

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ABSTRACT

Two-dimensional (2D) transition metal dichalcogenides (TMDs) are a revolutionary class of materials that have captivated the scientific community due to their unique electronic and physical properties. These materials are gaining immense attention for their potential applications in nanoelectronics, optoelectronics, and energy storage devices. Monolayer Vanadium Disulfide (VS₂), a member of the TMD family, stands out for its versatile electronic properties, making it a prime candidate for exploration in the realm of nanotechnology and advanced material science.

This study focuses on the effect of hydrostatic pressure on the electronic structure of monolayer VS₂, particularly aiming to determine the critical pressure required to induce a strain-induced electronic phase transformation. Utilizing the principles of density functional theory, an advanced and highly efficient theoretical simulation method, our research involved varying the hydrostatic binding in monolayer VS₂ from 0% to -5%. The investigation revealed that VS₂ inherently possesses a semiconducting band structure. Notably, at a hydrostatic pressure of -3%, VS₂ exhibited a spin-gapless electronic phase, a significant finding in the study of electronic properties of TMDs. More importantly, the material underwent a dramatic phase transformation from an insulator to a conductor at a strain value of -4%.

These findings have profound implications in the field of electronics and material science. The ability to control electronic phases in VS₂ through hydrostatic pressure paves the way for the development of new, innovative electronic devices, particularly in sectors that require precise manipulation of semiconducting, conducting, and insulating properties. Additionally, the study contributes to the broader understanding of the effects of mechanical strain on electronic properties in 2D materials, which is crucial for future advancements in nanotechnology and condensed matter physics.

KEYWORDS Hydrostatic Pressure, Electronic Phase Transformation, Monolayer VS₂, Density Functional Theory.

UNDESIRABLE SITUATIONS IN SILAGE PRODUCTION

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ABSTRACT

Silage is a fermented product formed by the conversion of water-soluble carbohydrates contained in roughages with high water levels into lactic acid through natural fermentation by lactic acid bacteria (LAB) in an airless environment. Although many forage crops suitable for silage production can be grown in our country, corn for silage has been the most preferred forage crop. In parallel with the increase in the number and quality of animals, silage corn cultivation areas are increasing daily. It is impossible to meet ruminants' nutrient needs only with concentrated feeds. Along with concentrated feeds, green or dry roughages, and silages should also be added to the rations. In this way, it is possible to realize both economic and more appropriate feeding.

Silage production does not require very advanced technical knowledge and equipment. However, in some situations and places, despite the increasing interest in silage production and silage feeding, there are sometimes some problems in providing educational practices and extension materials on this subject and there is a need for training and practices to eliminate these problems.

To produce quality silage, first of all, the selection of the appropriate place for storing the material to be silaged, the determination of the silo shape, the amount of silage needed for feeding the animals, the selection of the feed or feeds to be siloed or silaged, the proper preparation of the selected feeds for silaging, bringing the feeds to the silo, providing appropriate fermentation conditions, improving the quality of silage, covering the silage material and waiting for the silage to complete fermentation should be well known.

Forage varieties used for making silage are naturally in contact with yeasts and molds found in field conditions, contamination and deterioration in silage feed material can occur during harvesting, transportation, and storage, as well as poor management at different stages after harvesting, which is not paid attention and not carried out regularly, can cause rapid deterioration. If these are not prevented, losses in the silage materials produced and undesirable situations may be encountered during the feeding of animals.

KEYWORDS: Silage, Silage Production, Ruminant, Feeding, Aerobic Degradation,

SİLAJ YAPIMINDA İSTENMEYEN DURUMLAR

ÖZET

Silaj, su düzeyi yüksek kaba yemlerin içerdiği suda çözünebilir karbonhidratların havasız bir ortamda, laktik asit bakterileri (LAB) tarafından doğal fermantasyon yoluyla laktik aside dönüştürülmesi sonucu oluşan fermente bir üründür. Ülkemizde, silaj yapımına uygun birçok yem bitkisi yetiştirilebilmesine rağmen, silajlık mısır en çok tercih edilen yem bitkisi olmuştur. Hayvan sayısı ve niteliğindeki artışa paralel olarak silajlık mısır ekim alanları her geçen gün

artmaktadır. Geviş getiren hayvanların besin madde ihtiyaçlarını sadece yoğun yemlerle karşılanması mümkün değildir. Konsantre yemlerle birlikte yeşil veya kuru kaba yemler beraber silajların da rasyonlara ilave edilmesi gerekmektedir. Bu şekilde, hem ekonomik besleme hem de daha uygun beslemenin gerçekleştirilmesi mümkündür.

Silaj üretiminde çok ileri düzeyde teknik bilgi ve donanımına ihtiyaç duyulmamaktadır. Fakat; bazı durum ve yerlerde, silaj yapımı ve silajla beslemeye ilginin artmasına rağmen bu konuda eğitici uygulama ve yayım materyalinin sağlanmasında zaman zaman bazı sıkıntılar yaşanmakta ve bunların giderilmesine ilişkin eğitimler ve uygulamalara yapılmasına gereksinim duyulmaktadır.

Kaliteli silaj üretimi için öncelikle silolanacak materyalin depolanması için uygun yerin seçimi, silo şeklinin, hayvanların beslenmesi için gereksinim duyulan silaj miktarının tespiti, silo yapılacak ya da silolanacak yem veya yemlerin seçimi, seçilen yemlerin silolanması için uygun bir şekilde hazırlanması, yemlerin siloya getirilmesi, uygun fermentasyon şartlarının sağlanması, silaj kalitesini iyileştirme çalışmaları, silaj materyalinin üzerinin kapatılması ve silajın fermentasyonunu tamamlaması için bekleme süreçlerinin iyi bir şekilde bilinmesi gerekmektedir.

Silaj yapmak için kullanılan yem çeşitleri, saha şartlarında bulunan mayalar ve küflerle doğal olarak temas halindedir, silajlık yem materyalindeki bulaşma ve bozulmalar hasat, nakliye ve saklama sırasında ortaya çıkabildiği gibi, hasat sonrası dikkat edilmeyen ve düzenli yürütülemeyen değişik aşamalarda kötü yönetim, hızlı bozulmaya neden olabilmektedir. Bunların önüne geçilmemesi durumunda üretilen silajlık materyallerde kayıplar ve hayvanların beslenmesi sırasında istenmeyen durumlarla karşılaşılabilir.

ANAHTAR KELİMELELER: Silaj, Silaj Üretimi, Ruminant, Besleme, Aerobik Bozulma.

THE IMPORTANCE OF BODY CONDITION SCORE IN DAIRY FARMING

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ABSTRACT

The continuity of dairy cattle farms and the full utilization of the potential of fertility and milk production in the following periods constitute one of the important points. To ensure this, producers use different instruments. One of them is the body condition score. Body condition score (BCS) is considered to be the most practical method used in field conditions for the evaluation of energy reserves (fat tissues) for many animal species, including dairy cattle enterprises. Although it is an application that shows the feeding status, it gives an idea about animals in different subjects. It is an application based on determining the amount of subcutaneous adipose tissue in certain areas of the body in different animal groups. Recently, this parameter has been used in livestock farms to increase animal health, fertility and milk yield, herd management programs, feeding, welfare, care, and health in various applications. Although VKS is subjective in determining the body fatness rate, it is accepted as a fast and inexpensive method.

The body condition of the cow is determined by observing and evaluating the fullness or sharpness of the triangular shape between the hip bones and the upper point of the tail in the area limited to the knots on the back of the animal. In addition, the sharpness and prominence of the lumbar vertebrae (vertebrae) located at the back of the animal also inform the breeders about the body condition. A scale ranging from 1 to 5 points is used to evaluate body condition in dairy cattle breeding. On this scale, a score of 1 indicates that the cow is too thin and a score of 5 indicates that the cow is excessively fat. It is possible to see a decrease in body condition in early lactation cows due to negative energy balance. Under normal conditions, the daily weight loss of the cow in the early lactation period should not be more than one kilogram per day. Excessive weight loss may cause problems for the continuity of the enterprise and the herd. Thanks to this application, the appropriate care and feeding method can be determined according to the condition of the animals in the enterprises. Different applications can be carried out in a short time thanks to their body condition in the enterprise conditions.

KEYWORDS: Dairy cattle, Lactation, Body Condition Score, Feeding

SÜT SIĞIRCILIĞINDA VÜCÜT KONDÜSYON PUANININ ÖNEMİ

ÖZET

Süt sığırıcılığı işletmelerinin sürekliliğinin devamı, ilerleyen dönemlerde döl verimi ve süt üretim potansiyelinin tam olarak kullanılması önemli noktalardan birisini oluşturmaktadır. Bunun sağlanması için üreticiler farklı enstrümanlar kullanmaktadır. Bunlardan biride vücut kondüsyon skorudur. Vücut kondisyon skoru (VKS), süt sığır işletmeleri dahil, pek çok hayvan türü için enerji rezervlerinin (yağ dokularının) değerlendirilmesi açısından saha şartlarında kullanılan en pratik metot olarak kabul edilmektedir. Besleme durumunu gösteren bir uygulama olmakla birlikte işletmelerde, hayvanlar hakkında değişik konularda bir fikir vermektedir.

Değişik hayvan gruplarında vücut üzerinde belirli bölgelerde bulunan deri altı yağ dokusu miktarının belirlenmesi temeline dayanan bir uygulama şeklidir. Son dönemlerde, bu parametre hayvancılık işletmelerinde; hayvan sağlığı, döl verimi ve süt verimini arttırmada, uygulanacak olan sürü yönetim programlarında, besleme, refah, bakım ve sağlık değişik uygulamalarda kullanılmaktadır. VKS, vücuttaki yağlılık oranını belirlemede sübjektif olmasına rağmen hızlı ve ucuz bir yöntem olarak kabul görmektedir.

İneğin vücut kondisyonu, hayvanın arka kısmında yer alan budları ile sınırlı olan bölgede kalça kemikleri ile kuyruğun üst noktası arasında yaptığı üçgen şeklinin dolgunluğu; veya keskinliği gözlemlenerek değerlendirilmesi sonucunda belirlenmektedir. Ayrıca en geride yer alan bel omurlarının (vertebraların) keskinliği ve belirginliği de vücut kondisyonu hakkında yetiştiricileri bilgilendirmektedir. Süt sığırcılığında vücut kondisyonunun değerlendirilmesinde 1 ile 5 puan arasında değişen bir skala kullanılmaktadır. Bu skalada 1 puan ineğin fazla zayıf, 5 puan ise aşırı derecede yağlı olduğunu ifade etmektedir. Erken laktasyondaki ineklerde negatif enerji dengesi nedeniyle vücut kondisyonunda bir düşüş görmek mümkündür. Erken laktasyon döneminde inekte meydana gelecek günlük kilo kaybı normal şartlar altında, günlük bir kilogramdan fazla olmaması arzu edilmektedir. Bunun fazla olaması işletmenin ve sürünün devamlılığı açısından sorunlar oluşturabilmektedir. Bu uygulama sayesinde, işletmelerde hayvanların durumlarına uygun bakım ve besleme yöntemi belirlenebilmektedir. İşletme koşullarında, vücut kondisyonları sayesinde farklı uygulamalar kısa süre içinde yapılabilir.

ANAHTAR KELİMELEER: Süt sığırısı, Laktasyon, Vücut kondüsyon Puanı, Besleme.

INVESTIGATION OF MECHANICAL AND THERMAL PROPERTIES OF BATTERY SYSTEMS IN HYBRID AND ELECTRIC VEHICLES

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ABSTRACT

In the last century, the limited availability of fuel-based energy, global warming and exhaust emission limit problems have led to the need to develop new or alternative methods to generate energy for vehicles with internal combustion engines. For this reason, as a solution to this demand, studies on hybrid electric vehicles with an electric motor added to the currently used internal combustion engine vehicles and electric vehicles operating only with an electric motor have increased and attracted great interest. There are a number of problems that need to be overcome in order to meet the expectation in electric vehicles or to bring this expectation closer to the expected level. At the beginning of these problems, the low range and high battery cost come to the fore. The most basic requirement that can increase the range of electric vehicles and make them more preferred is battery technology. Developments in battery technology are directly related to the development of hybrid and electric vehicles. Electric vehicles are heavier than internal combustion vehicles due to the weight of battery packs or batteries that provide energy in electric vehicles. Various battery pack designs are made to increase the range and bring it to the desired level and reduce weight. The excess of batteries reduces fuel performance as it increases the weight of the vehicle. Fuel performance increases the preferability of hybrid and electric vehicles. With the development of technology, various studies are carried out to increase fuel performance in electric vehicles and to protect the battery packs by using advanced and innovative materials that have advantages in terms of mechanics to protect the battery packs and thermally to protect the battery health and life. This research provides an overview of the thermal and mechanical protection and development of batteries in hybrid and electric vehicles.

KEYWORDS: Battery Block, Hybrid Vehicles, Electric Vehicles, Battery Packs.

HİBRİT VE ELEKTRİKLİ ARAÇLARDA BATARYA SİSTEMLERİNİN MEKANİK VE TERMAL ÖZELLİKLERİNİN İNCELENMESİ

ÖZET

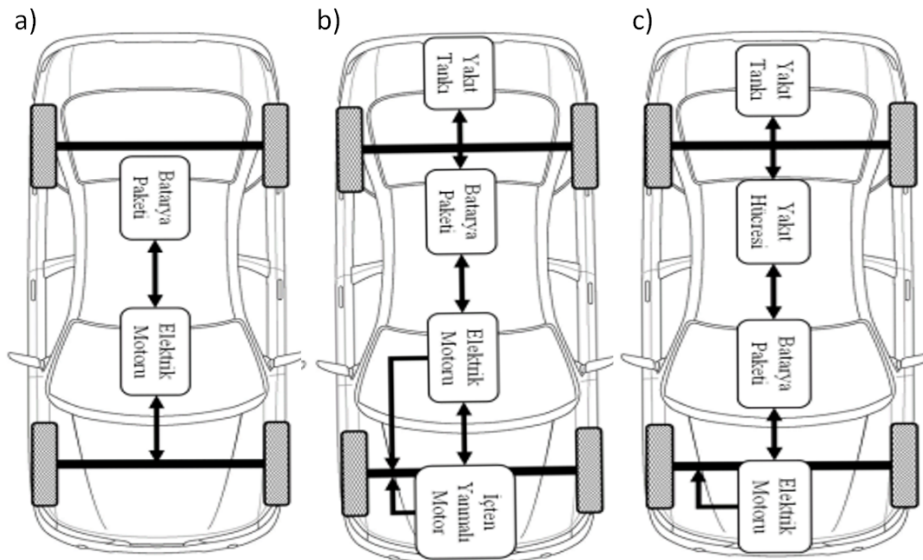
Son yüzyılda yakıt bazlı enerjinin sınırlı olması, küresel ısınma ve egzoz emisyon limit sorunları, içten yanmalı motora sahip araçlara enerji üretmek için yeni veya alternatif yöntemler geliştirme ihtiyacı doğurmuştur. Bu nedenle bu talebe çözüm olarak halihazırda kullanılmakta olan içten yanmalı motorlu araçlara ilave eklenen elektrik motoruyla birlikte hibrit elektrikli araçlar ile sadece elektrik motoruyla çalışan elektrikli araçlar üzerinde çalışmalar artmış ve büyük ilgi görmüştür. Elektrikli araçlarda beklentiyi karşılamak veya bu beklentiyi beklenen düzeye yaklaştırmak için aşılması gereken bir takım problemler vardır. Bu problemlerin başında menzilin az ve batarya maliyetinin yüksek oluşu öne çıkmaktadır. Elektrikli araçların menzillerinin artması ve daha fazla tercih edilmelerini sağlayabilecek en temel gereklilik

batarya teknolojisidir. Batarya teknolojisinde yaşanan gelişmeler hibrit ve elektrikli araçların gelişmesiyle doğrudan ilişkilidir. Elektrikli araçlarda enerji sağlayan pil paketleri veya bataryalarının ağırlığı nedeniyle elektrikli araçlar içten yanmalı araçlara göre daha ağırdır. Menzili arttırma ve istenilen düzeye getirmek ve ağırlığı azaltmak için çeşitli pil paket tasarımları yapılmaktadır. Pilleri fazla olması aracın ağırlığını arttırdığı için yakıt performansını azaltmaktadır. Yakıt performansı ise hibrit ve elektrikli araçların tercih edilebilirliğini arttırmaktadır. Teknolojinin gelişmesiyle elektrikli araçlarda yakıt performansını arttırmak ve pil paketlerini korumak için mekanik, pil sağlığı ve ömrünü korumak için termal açıdan avantajlara sahip olan ileri ve yenilikçi malzemeler kullanılarak bataryanın korunması için çeşitli çalışmalar yapılmaktadır. Bu araştırma hibrit ve elektrikli araçlardaki bataryaların termal ve mekanik açıdan korunması ve geliştirilmesi için genel bir bakış sunmaktadır.

ANAHTAR KELİMELEER: Batarya Bloğu, Hibrit Araçlar, Elektrikli Araçlar, Pil Paketleri.

GİRİŞ

Endüstrinin son zamanlarda hızlı gelişmesi neticesinde, içten yanmalı motor kullanan araçların üretimi ve kullanılması dünya çapında hızla artmıştır ve bunun neticesinde bir dizi çevre kirliliği ve enerji kıtlığı sorunu ortaya çıkmıştır [1-4]. Bu sorunların çözülmesi için günümüzde hem elektrik motoru hem de içten yanmalı motoru bünyesinde barındıran hibrit elektrikli araçlar (HEV), araç içerisindeki bataryayı dışarıdan şarj etme imkanı sunan fişli hibrit elektrikli araçlar (PHEV), sadece elektrik motoru bulunduran elektrikli araçlar (EV) ve yakıt hücresi elektrikli araçlar (FCEV) dahil olmak üzere yeni enerji kaynaklı araçların üretimi ve geliştirilmesi için çalışmalar hızlanmaktadır [4-6]. Ancak bu değişim, EV'lerin ticarileştirilmesinde çeşitli teknik zorluklar ortaya çıkarmaktadır [7-10]. Bu teknik zorluklara enerjinin depolanması ve dağıtılması, bataryaların termal ve mekanik açıdan korunması, şarj etme süresi ve şarj istasyonlarının konumlandırılması gibi örnekler verilebilir.

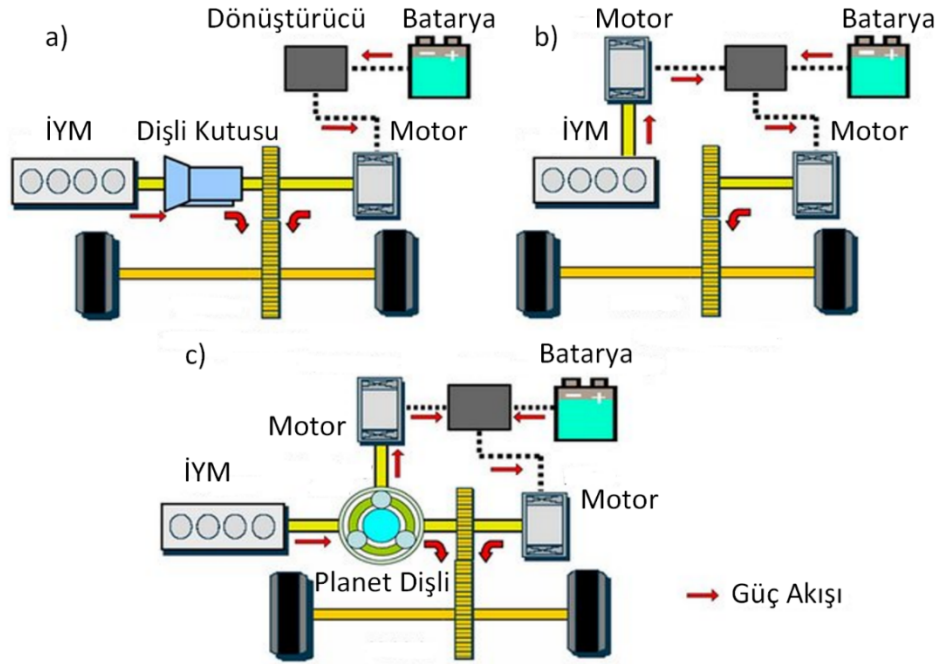


Şekil 1. a) Tamamen elektrik motorlu araçlar, b) Hibrit motorlu araçlar c) Yakıt hücresi elektrikli araçlar [11]

Hibrit motorlu araçlar, kullandıkları enerjiyi araç bünyesinde iki veya daha fazla şekilde depo eden ve kullanan araçlardır. Tipik bir hibrit elektrikli araçta, yakıt dönüşümünü sağlayan ilk

form içten yanmalı motordur [12]. Diğeri ise yakıtı çift yönlü olarak depolayan bir elektrik depolama cihazıdır. Enerji depolanması ve depolanan enerjinin kullanılması, hibrit elektrikli araçlarda birçok avantaj sağlamaktadır. Bir enerji depolaması kullanarak, hibrit elektrikli araçlarda frenleme sırasında enerjinin geri kazanılması, motorun küçültülmesi, motorun daha verimli çalıştırılması ve hareket halinde olmadığında motorun kapatılması gibi yakıt tüketimini azaltmanın birkaç farklı yolu vardır [13].

PHEV'ler ulaştırma sektöründe yeni ve gelecek bir teknolojidir. Çalışma prensibi temelde, tahrik gücü elde etmek için içten yanmalı bir motora ilave güç sağlamak için ekstra bir akü paketine sahiptirler. Bu yönüyle HEV'lere çok benzemektedirler.



Şekil 2. Hibrit araç konfigürasyonları a) paralel b) seri c) güç paylaşımı (paralel/seri) [14]

PHEV'ler, 4 kWh veya daha fazla akü depolama sistemine sahip, aküyü harici bir kaynaktan şarj etme olanağına sahip olan ve elektrik modunda en az 16 km yol kat etme kabiliyetine sahip olan HEV'ler olarak tanımlanmaktadır [15]. Bu özellikleriyle PHEV'ler istenilen gücü sağlamak için birden fazla seçeneğe sahiptir. Bunlar yalnızca fosil yakıtlarla, yalnızca elektrikle ya da her ikisinin birleşimiyle hibrit olarak çalışabilmektedir. Yakıt türü seçenekleriyle fosil yakıtlara bağımlılığın azalması, yakıt ekonomisinin artması ve sera gazı emisyonlarının azalması, tahrik gücü seçeneğiyle güç verimliliğinin artması ve araçtan şebekeye geçiş gibi çok çeşitli potansiyel avantajlara yol açmaktadır [16].

Yenilenebilir yakıtların dışında içten yanmalı motorlara sahip araçların yenilenemeyen geleneksel yakıtları tüketmesi ve bu araç sayısının artması hem enerji hem de çevre sorunlarına neden olmuştur. Yenilenebilir enerji kaynağı tüketen ve yeni bir teknoloji olarak nitelendirilen EV'ler özellikle sanayileşmenin artmasından sonra, yüzyılı aşkın süredir varlığını sürdürmektedir. Thomas Parker tarafından 1884 yılında üretilmiş araç, ilk elektrikli araba örneği olarak sunulmaktadır. Üretilen ilk elektrikli araç için farklı başka örnek olarak Ferdinand Porsche'nin 1899'da üretilen elektrikli otomobili verilmektedir. Henry Ford, Model T'yi yeni bir seri üretim süreciyle geliştirmeden önce, EV üreticileri, 1920'lerde ABD'de üretilen toplam araçların %28'inin elektrikli olduğunu belirtmiştir [17]. Ancak elektrikli otomobillerin o

dönemki fiyatlarının fazla olması ve konvansiyonel diğer araçların hızla gelişmesi nedeniyle elektrikli araçlara olan ilgi ve araçların tanıtımı yavaşlamıştır. 21. yüzyılın başından itibaren, oluşan çevre kirliliği ve enerjiyle ilgili sorunlar nedeniyle elektrikli araçlarla ilgili araştırmalar hız kazanmıştır.

Modern toplumda vazgeçilmez ulaşım aracı olan araçlar, her yerde kullanılmakta ancak aynı zamanda doğaya zarar veren ana kaynaklarından biridir. Araçların doğaya verdiği zararları engellemek adına hacimsel olarak küçültmek yerine emisyonların azaltılmasına yönelik çözümler geliştirilmiş ve bu çözümlerden biri de elektrikli taşıtlardır [18]. Genel olarak elektrikli araç, özellikle akıllı şebekeler her yerde mevcut olduğundan [19-21] fosil yakıtlara dayanan araçlara göre enerji verimliliği bakımından avantajlı, çevre dostu ve daha temizdir [22]. Elektrikli araçların yaygın olarak kullanılması oluşacak çevresel sorunları ve yenilenebilir enerji kaynaklarının kullanılmasıyla da yakıt maliyetlerinin büyük oranda azaltacağı düşünülmektedir [23]. Bu nedenle elektrikli araçlar son yıllarda endüstrinin yanı sıra akademinin de ilgisini çekmektedir [24]. Trafikte kaydı bulunan araçların kullandıkları yakıt türlerine göre dağılımı Tablo 1’de gösterilmiştir.

Tablo 1. Trafikte kaydı bulunan araçların kullandıkları yakıt türlerine göre dağılımı [25]

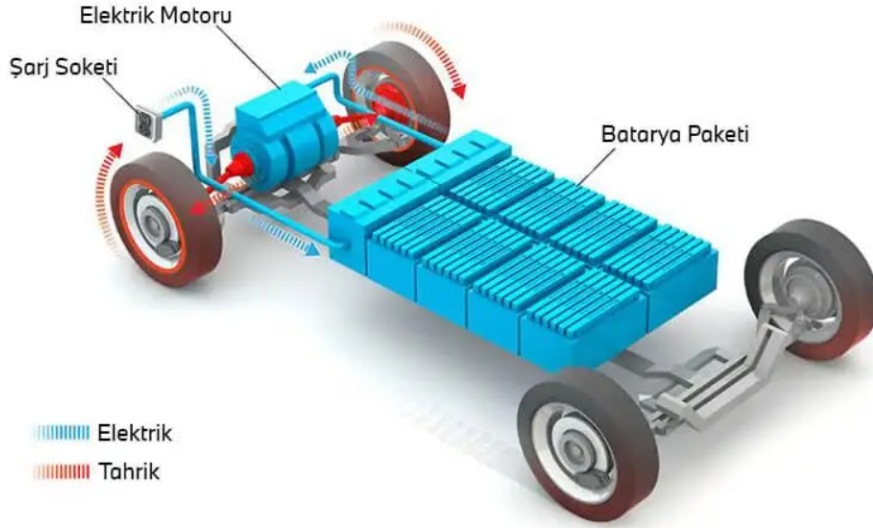
	Eylül				Ocak-Eylül			
	2022		2023		2022		2023	
	Sayı	Pay (%)	Sayı	Pay (%)	Sayı	Pay (%)	Sayı	Pay (%)
Toplam	39831	100	73684	100	410513	100	694156	100
Benzin	27903	70,1	44855	60,9	288113	70,2	460352	66,3
Dizel	7504	18,8	9659	13,1	74192	18,1	124745	18
Hibrit	2748	6,9	8421	11,4	34896	8,5	62806	9
Elektrik	920	2,3	9832	13,3	4559	1,1	36710	5,3
LPG	756	1,9	917	1,3	8753	2,1	9543	1,4

EV’lerde enerji, araç içerisinde genellikle aracın taban kısmına yayılı olarak montajlanan birçok pillerin oluşturduğu batarya paketlerinden elde edilmektedir. Bu batarya paketleri, farklı tasarlanmış olan şarj soketleri yardımıyla araca şarj istasyonlarından sağlanmaktadır. Bataryaların şarj kapasiteleri, aracın yol alabileceği mesafeyi belirlediği için oldukça önem arz etmektedir. Aracın alt tabanında bulunan ve araca enerji sağlayan bataryaların, yakıt ekonomisi adına hafif ve dayanıklı olması, aynı zamanda pillerin kimyasal yapılarından ötürü, sıcaklık kontrolü ve ısı akışı oldukça önem arz etmektedir.

Li-ion piller elektronik cihazlarımızda günlük hayatımızda da sürekli kullandığımız pil türüdür. Kimyasal özelliklerinden ötürü birçok avantaja sahip bu piller, sera gazı emisyonlarının azaltılmasına yönelik mevcut anlaşmaları destekleyen elektrikli ve hibrit araçlarda da yaygın olarak kullanılmaktadır. Batarya alanında yaşanan bu gelişmeler sonucunda dünyada elektrikli araç talebi artmıştır. En Yaygın Li-İon bazlı piller ve özellikleri Tablo 2’de gösterilmiştir.

Tablo 2. En Yaygın Li-İon Bazlı Pillerin Özeti [26]

	Lityum Kobalt Oksit	Lityum Manganez Oksit	Lityum Nikel Manganez Oksit	Lityum Demir Fosfat	Lityum Nikel Kobalt Alüminyum Oksit	Lityum Titanat Oksit
Kısaltma	LiCoO ₂	LiMn ₂ O ₄	LiNiMnCoO ₂	LiFePO ₄	LiNiCoAlO ₂	Li ₂ TiO ₃
Nominal Voltaj	3.60V	3.70V	3.60V	3.20V	3.60V	2.40V
Tam Şarj	4.20V	4.20V	4.20V	3.65V	4.20V	2.85V
Özgül Enerji	150-200 Wh/kg	100-150 Wh/kg	150-220 Wh/kg	95-125 Wh/kg	210-270 Wh/kg	70-80 Wh/kg
Döngü Ömrü	500-1000	300-700	1000-2000	1000-2000	500	3000-7000
Uygulamalar	Cep telefonları, Tabletler, Dizüstü Bilgisayarlar,	Elektrikli Aletler, Tıbbi Cihazlar, Güç Aktarım Organları.	E-bisikletler, Tıbbi Cihazlar, Elektrikli Araçlar.	Elektrikli Araçlar.	Elektrikli Araçlar (Tesla)	Elektrikli Araçlar, Sokak Lambaları.
Üstün ve Zayıf Yönleri	Yüksek Enerji Sınırlı Güç	Yüksek Güç, Daha az kapasite	Yüksek Kapasite ve Yüksek Güç	Yüksek Güç ve Düşük Kapasite	Orta Güçte En Yüksek Kapasite	Hızlı Şarj, Geniş Sıcaklık Aralığı



Şekil 3. EV konfigürasyonu [27]

Li-ion pillerin yapısı orta vadede kritik metallerden oluştuğundan, çevresel sorunlara sebep olan ve yenilenemeyen enerji kaynakları ile çalışan içten yanmalı araçların olmadığı sürdürülebilir kaynaklar ile temiz bir geleceğin anahtarı ve geri dönüşümüdür. Mevcut durumun vehametini ve ilerde oluşacak daha kötü durumların önüne geçmeye yönelik yeni pil tasarımı, geri dönüşüm yolları ve tersine lojistik stratejilerinin yanı sıra sürdürülebilir kalkınma politikaları için de önemlidir. Piller araçlarda ısınma sorunlarının azaltılabilmesi için ve güneşten radyasyonu engelleyebilmek için araçların alt tabanına yerleştirilmektedir. Bu aynı zamanda aracın ağırlık merkezi dengesini de olumlu yönde etkilemektedir. Pillerin termal açıdan korumak pil sağlığı ve ömrü için oldukça önemlidir. Termal açıdan sıcaklık dağılımı, ısı akışının eşit olarak sağlanması da oldukça önemlidir. Bu nedenle kullanılan soğutma sıvılarının termal özellikleri de önemlidir. Elektrikli araçların bataryalarını termal açıdan korumak için, dışarıdan gelecek etkileri de azaltmak önem arz etmektedir. Bu nedenle bataryaların muhafazası ve yakıt ekonomisi için hafif olması gerekmektedir.

Termal Açıdan Piller

Batarya pil hücreleri elektrikli ve hibrit araçlarda yüksek ısılara maruz kalmaktadır. Bu maruziyet bazen yüksek devir ve hızlarda pil hücrelerine zarar vermekte ve fiziksel yapısını bozmaktadır. Özellikle ısının artmasıyla pillerin genleşme durumu araçlarda büyük riskler oluşturmaktadır. Ayrıca sadece batarya paketleri değil, elektronik güç kontrol ünitesindeki invertör de soğutulmaya ihtiyaç duymaktadır. Oluşabilecek tüm durumlar araçların verim ve performansını etkilemekte, sürüş konforunu kötüleştirilmektedir. Bu durumları indirgeyebilmek için soğutma sistemlerinde çeşitli önlemler alınmaktadır. Genel olarak soğutma iki türlü yapılmaktadır.

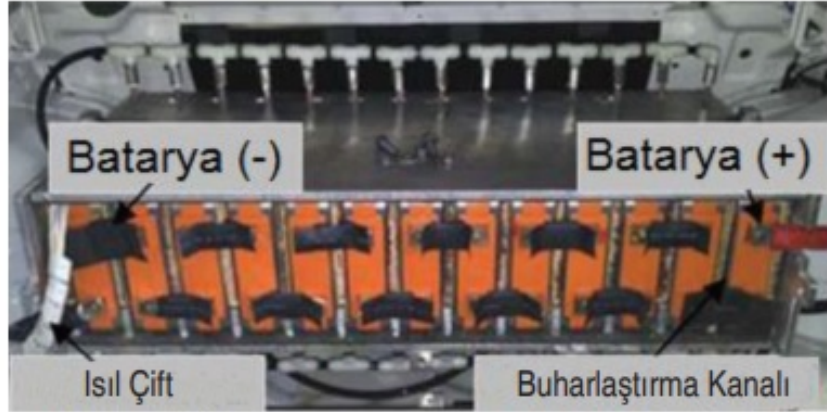
- Dış ortam havası ile soğutma;
- Soğutma sıvısı kullanarak soğutma;

Dış ortam havası soğutma sistemlerinde önem arz etmektedir. Ancak pil hücrelerinin atomik yapısı düşünüldüğünde sadece ortam havası bu durumdaki soğutma için yetersiz kalmaktadır.

Soğutma sıvısı kullanarak soğutma en etkili soğutma sistemlerinin başında gelmektedir. Suyun termal iletkenliğinden faydalanarak ısının su ile taşınması ve batarya paketlerinin soğutulması daha yeterli bir soğutma olacaktır. Soğutma sıvıları genellikle içten yanmalı motorlarda

su+antifiriz olmaktadır. Elektrikli ve hibrit araçlarda farklı soğutma sıvıları çeşitli donanımlarla pillerin soğutulması için kullanılabilir. Kullanılan çeşitli soğutma sistemleri;

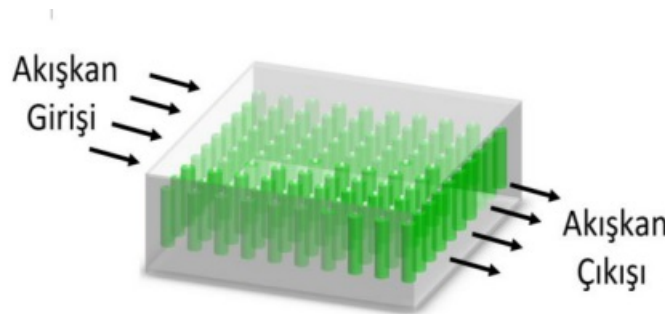
- Hava soğutmalı ve ısıtılmalı sistemler
- Sıvı soğutmalı ve ısıtılmalı sistemler
- Isı pompalı soğutma sistemleri
- Evaporatif soğutma sistemleri



Evaporatif Soğutma Sistemi [28]

Ortam sıcaklıkları arttıkça örneğin 45°C-50°C dolaylarında, batarya paketi içerisindeki sıcaklık çalışma sıcaklığının üzerine çıkmaya başlar, 55°C aştığında termal kaçaklara neden olur. Ayrıca sıcaklık dağılımının dengeli olmaz bozulma ve çevrim ömrü üzerine önemli ölçüde etki eder. Eğer yeterli soğutma sağlanamazsa, hücreler arasında 2C deşarj hızında 2°C, 6,67C deşarj hızında 4,8°C sıcaklık farkı oluşmaktadır [29]. Bataryada bu olumsuzluklar menzil kapasitesini de etkiler, çünkü hücreler arasındaki ısı transferi batarya paketi ve hava arasındaki ısı transferinden daha hızlı bir şekilde gerçekleşir. Yani bir hücrenin bozulması, termal kaçak tüm batarya paketine yayılmaktadır. [30].

Bataryaların soğutulması için Etilen glikol ve saf su genellikle kullanılmaktadır. Ancak teknolojik gelişmelerle nanopartikül katkılı sıvılar ve ilerleyen zamanlarda kriyojenik sıvılar da bu soğutma sistemlerine dahil edilebilecektir.



Genel olarak bataryalarda soğutma [31]

Pil paketlerinin korunması

Batarya bloğu pil hücreleri, sahip oldukları özellikler nedeniyle ciddi risk ve tehlikeler barındırabilmektedir. Yüksek voltaj ve enerji depolama kapasiteleri pil hücrelerinin en belirgin özellikleri arasında yer almaktadır. Bu sebeple kullanılan pil hücrelerinin korunması ve güvenliğinin sağlanması gerekmektedir. Pil hücrelerinin muhafazası, pil bağlantılarının düzgün bir şekilde yapılabilmesi ve açığa çıkan veya çıkabilecek ısıнын kontrol altında tutulabilmesi

için çok işlevli bir modül tasarımı gerekmektedir. Tasarlanacak bu modülü seçimi araca ekstra ağırlık yapmaması için kalınlığı, pillerin güvenliği ve verimi için hayati önem taşımaktadır. Yapılan araştırmalarda, kullanılan batarya bloğunu korumak için yaygın olarak metalik malzemeler tercih edilmektedir. [32-33].

Alüminyum malzemesinin sahip olduğu mekanik ve termal özelliklerinden ve maliyetinin uygun olmasından ötürü bataryaların korunmasında da tercih edilmektedir. Ayrıca, alüminyum malzemesinin hafifliği ve düşük termal genleşme katsayısı ile sıcaklık değişimlerine karşı yüksek direnç göstermektedir. Böylece batarya modüllerinin sıcaklık dalgalanmalarından etkilenmesini azaltmakta ve yakıt tasarrufu sağlamaktadır. [32].

Teknolojinin gelişmesiyle birlikte, mekanik ve termal üstünlüklerinden dolayı kompozit malzemeler birçok alanda kullanılmaktadır. Daha önce yapılan çalışmalarda takviye elemanı olarak kullanılan fiberler ile matris malzemesi olarak kullanılan reçinenin birlikte kullanılmasıyla birlikte çeşitli çalışmalar yapılmış ve zayıf olan fiberlerin reçine ile uyumu ile daha sağlam yapıların elde edilebileceği görülmüştür. Bu sebeple üretilen elyaf takviyeli polimer kompozitler günümüzde mühendislik uygulamalarında yaygın olarak tercih edilmekte ve kullanılmaktadır. Mekanik özellikleri bakımından hafif olmaları yakıt performansını, dayanıklı olmaları ise pil paketlerini dışarıdan gelecek darbelere karşı koruma sağlaması elektrikli araçları olumlu yönde etkileyeceğinden dolayı kompozit malzemeler son zamanlarda elektrikli araçlar için tercih edilmektedir. Li-İon batarya paketlerini patlaması ve yanması gibi oluşabilecek tehlikelere karşı da termal direnç sağlamaktadır.

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PROPERTIES OF $\text{LiAlSi}_2\text{O}_6$ PHOSPHOR

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ABSTRACT

Nowadays, with the development of technology in the light of the constantly developing R&D studies, human beings are moving towards a life that is more environmentally friendly and where problems are solved in a shorter time. Within the framework of this progress, the outputs of thermally stimulated luminescence studies are also used in the industry. Our study includes thermally stimulated luminescence studies of a phosphor mineral called spodumene.

Spodumene, deriving from the Greek *spodumenos* (σποδοῦμενος), meaning "burnt to ashes", an inosilicate, a kind of single crystal which is a transparent material. In this study luminescence properties of lithium-rich Spodumene are studied. Because thermally stimulated luminescence studies give significant knowledge about the structure of the mineral.

Phosphor minerals absorb and store energy from ionizing radiation just like UV, beta irradiation, X-ray radiation, or gamma radiation. If a mineral is heated to a sufficiently high temperature, some of the stored energy is released in the form of light and we call it thermally stimulated luminescence.

We studied not only the beta-irradiated glow peaks of spodumene, but also the natural thermally stimulated emission of the mineral. By the way, the response of the phosphor to beta irradiation is given. Finally, all the glow peaks are given together and compared in each other.

KEYWORDS: silicate, mineral, luminescence, phosphor, thermally stimulated luminescence.

FACTORS AFFECTING BRAIN DEVELOPMENT

Fizze Kazımova

Mastr, Nahçıvan Devlet Üniversitesi, Biyoloji öğretim metodolojisi

ABSTRACT

It is a difficult subject to explain, but I wanted to talk about a subject that is life-changing when understood. Brain... Even though the brain constitutes 2% of our body, it needs 30% of our energy. We lose at least 85000 brain cells a day. Our brain is involved in everything we do. When a problem occurs in our brain, it most likely means that problems have started in our lives. The factors that cause problems in our brain are mainly alcohol, drugs, Smoking, high stress, obesity, diabetes, anxiety disorder, depression, stopping learning are the reasons for the decrease in brain cells at a high rate. But the brain is open to restructuring until death. How? Regular sleep, positive social relations, healthy and beneficial habits, positive thinking. Every time we learn new information, our brain creates a new dendrite. To give this a rough formula, new information = a new dendrite.

A high percentage of people are born healthy. Then, as a result of environmental factors, food, and wrong interventions, the cells in our body undergo deformation. This brings with it health problems. So, how would you react if I said that we can cure the most serious diseases with the power of thought? Understanding that the power we all seek outside is within us actually means solving the mathematics of the matter. In this article, I have blended the health-related knowledge of Hippocrates, Ibn Sina and world-famous scientists. You have heard that many seriously ill patients healed when they had to discover their own strength. The organism as a whole and each cell is the whole world. He is more knowledgeable than his academics. Whatever we seek outside is actually hidden within us. . We just need to give ourselves this chance.

KEYWORDS: intelligence, brain, subconscious, mind, believing, eating right and living right.

BEYİN GELİŞİMİNİ ETKİLEYEN FAKTÖRLER

ÖZET

Anlatması zor bir konu amma anlaşıldığında hayat degistiren bir konu üzerine konusmak istedim. Beyin. Beyin vücudumuzun 2% ni olustursada enerjimizin 30% na ihtiyaci vardır. Günde en az 85000 beyin hucresi kaybederiz. Beynimiz yaptığımız her ise dahildir. Beynimizde bir sorun olusdugunda yuksek ihtimal hayatımızdada sorunlar baslamis demekdir. Beynimizde sorun yaradan faktörler esasen alkol, uyusturucu, sigara, yuksek stress, obezite, diabet, kaygi bozuklugu, depresyon, oyrenmeyi durdurmak. Yüksek oranda beyin hücrelerinde azalma sebebidir. Amma ölene kadar beyin yeniden yapılanmaya müsaitdir. Nasilmi? Düzenli uyku, pozitif sosyal iliskiler, saglikli ve yararlı alışkanlıklar, pozitif düşünce.. Her yeni bir bilgi öyrendigimizde beynimiz yeni bir dendrit olusturur. Buna kabaca formül vermis olursak yeni bir bilgi=yeni bir dendrit.

Yüksek oranda insanlar doguldugu zaman saglikli dogulur. Daha sonra cevresel faktörler, yiyecekler, yanlis mudaheler sonucunda vucudumuzdaki hücreler deformasyon gecirir. Buda beraberinde saglik sorunlarını getirir. Peki en ağır hastalıkları düşünce gücüyle iyilestire biliriz. Hepimizin dışarıda aradığı çarenin, gücün icimizde oldugunu anlamak aslında işin matematigini çözmek demekdir. Bu yazımda Hippokratın, Ibni Sinanın ve dünya şöhretli bilim

adamlarının saglikla bagli bilgilerinide harmanladim. Pek cok agir hastalarin kendi guclerini kesf etmek zorunda kaldiginda iyilestigini duymusunuzdur. Orqanizma bütünlükle ve her bir hücre dünyanın tüm akademisyenlerinden daha cok bilgilidir. Dışarıda aradığımız ne varsa aslında icimizde saklı. Sadece kendimize bu şansı tanımamız lazım.

ANAHTAR KELİMELEER: zeka, beyin, bilincalti, zihin, inanmak, dogru beslenmek ve dogru yasamak.

GİRİŞ

Beyin gelişimini etkileyen faktörler.

Anlatması zor bir konu amma anlaşıldığında hayat degıştiren bir konu üzerine konuşmak istedim. Beyin.. Beyin vücudumuzun 2% ni oluştursada enerjimizin 30%na ihtiyacı vardır. 1,5 kg ağırlığında, 1200sm hacminde olan beyin asrlardır araşıdırılıyor. Beynimiz 4 temel bölümden oluşur. Serebrum, beyincik, beyin sapı, orta beyin. Ve onlarda her biri farklı bölümlerden oluşur. Her bölümün kendi işi vardır.

Serebrum- bizi diyer canlılardan ayıran en önemli bölümdür. Beynin³/₄nü kaplar. Sol ve sag bölümden oluşur. Dış kısımdaki beyin zarı düşünce merkezidir ve fonksiyonların temelidir. Analitik beceriler, matematik becerileri, müzik, görsel beceriler bu merkezdedir.

Beyincik- en temel fonksiyonu kas hareketlerinin koordinasyonudur. Özellikle vücut dengesi ve duruşundan, spor aktivitelerinde, daha kordineli ve dengeli hareketler yapmamızı saglayan bölümde burasıdır.

Beyin sapı- beyin ile omurilik arasında bir nevi istasyondur. Kalp atışı, nefesalma, uyku ve yeme gibi temel fonksiyonları bu bölümde gerçekleşir. Tüm bilgiler beyin sapı sayesinde ilerler.

Orta beyin-Vücudun ihtiyaclarını koordine eder. Tüm hormonlar burada tenzimlenir.

Tüm bu bölümler müthiş karmaşık bir systemin sadece cok kısa bir özeti. Konuşacağımız konunun teknik bir altyapısıydı. Beynin işlevsel olarak sürekli bir değişim ve dönüşüm içerisinde olması, karmaşıklığının temel sebebidir. Beyin yüz milyarın üzerinde nöronla yüz trilyon üzerinde bağlantıyla görebileceğimiz en müthiş yapılardandır. Günde en az 85000 beyin hücresi kaybederiz. Beynimiz yaptığımız her işe dahildir. Beynin içindeki sinir hücreleri yeni bağlantılar kurar. Beynimizde bir sorun oluştuğunda yuksek ihtimal hayatımızdada sorunlar başlamış demektir. Beynimizde sorun yaradan faktörler esasen alköl, uyuşturucu, sigara, yüksek stress, obezite, diabet, Kaygı bozukluğu, depresyon, çevresel faktörler, öğrenmeyi durdurmak. Amma ölene kadar beyin yeniden yapılanmaya müsaitdir.

Biz beynimizin cok az bir kısmını kullanıyoruz. Zihinsel kapasitemizin 10% nu kullanıyoruz. UCLA beyin araştırma enstitüsünde yapılan nörolojik araştırmalar inanılmaz bir hipotez öne sürdü ve herkesde gizli olan muazzam yeteneklere işaret etdi. İnsan beyni geniş bir veri deposudur. Bu verileri problem çözme amacıyla kullanmak için kendimizi nasıl proqramlamamız lazım olduğunu bilmiyoruz. Eğer beynimizin yarısını çalıştırabilseydik, 40 dil öğrenibilirdik, en ağır ansiklopedileri ezberleyebilirdik. İnsanın zihinsel potansiyellerinin genel kabul görmüş teorik görüşüdür. Peki bu devasa potansiyelden daha iyi bir şekilde nasıl faydalana biliriz. Herbert Ottonun belirttiği gibi kapasitelerine yakın yaşayan ve potansiyellerini harekete geçirmeye devam eden kişilerin belirgin bir refah duygusuna sahip

oldukları açıktır. Hic birimiz beynimizin gercek yetenekleri hakkında derin fikre sahip değiliz. Amma keşfedilmemiş bir altın madenine sahibiz. Beynimizi doğru kullanırsak insanın hormon dengesi değiştirile bilir, öğrenme qabiliyyeti artırıla bilir, iştahı kesilerek zayıflaya bilir, en ağır hastalıkları inanarak iyileştire bilir.

Beyin bir kas sistemidir. Onu doğru kullansak güçlenir, gelişir. Nasıl tüm kaslarımız spor yapınca dahada güçlenirse beynimizde aynı şekilde güçlenir. Beyni geliştiren esas faktör daima yeni bir şeyler öğrenmektir. Zengin dille büyütülen çocuklarda soyut düşünme kapasitesi, problem çözme kapasitesi, genel zekanın daha yüksek olduğuna dair bir sürü rapor var. Farklı diller farklı aktivasyonlara sebep olur. Ve ya yeni bir enstruman calmak . Müzisyenler beyninin tüm bölümünü kullanıyorlar. Dikkat eksikliyi aradan kaldırır. Müzikle ilgilenen insanların beyninde adeta nöronlar parti veriyorlar. Yani müzikle ilgilenen insanların beyinlerinde birçok nöronun aktivite gösterdiği devasa etkileşimler söz konusudur. Bir müzik aleti çalmak görsel, işitsel, duyuşal, motor korteksin hep beraber çalıştığı oldukça etkili bir egzersizdir. Bu egzersizler başka aktivitelerde de işinize yarayacak bir altyapı oluşturmaktadır. Enstruman çalmak beynin carpus collomus bölümünün yani iki yarımküre arasındaki köprünün hacmini artırdığı gösterilmiştir. Bu insanların problemlere daha yaratıcı çözümler getirdiği bilinmektedir. Haftada sadece bir saat enstruman çalmak bile birkaç ay sonunda beynin hafıza , işitme ve motor işlevlerinden sorumlu bölgelerinde büyüme ve aktivite sağlamaktadır. Duyguları işleme, sorunlar karşısında yaratıcı çözümler geliştirme ve yabancı dil öğrenmede olduğu gibi yeni bir görevi gerçekleştirmede daha yüksek performansı ortaya çıkmasını sağlar.

Egzersiz- beyin üzerindeki etkilerinin çok önemli olduğunu belirtmek isterim. Bu konuda çalışmalar yürüten profösör Suzuki egzersizin beyin üzerindeki etkilerini şöyle anlatıyor. Egzersiz yaptığımız anda dopomin , serotonin, noradrenalin gibi hormonlar miktarını vucutta artırıyor. Modunuz anında yükselir. Dikkat ve odaklanmayı artırıyor. Beynimizde yeni sinir hücreleri üretilir. Alzaymr hastalarında yüksek oranda iyileşme görülmüştür .Sinir hücreleri yeni bağlantılar yaratır.

Sağlıklı beslenme – dogru beslendiyimiz zaman beyin hücreleri kendini yeniliyor. Hafıza kaybının temel sebeplerinden biri en önemlisi yanlış beslenmedir. İbni Sinanın verdiyi tavsiyeleri bugünüme kadar gelib çıkmıştır. Sofradan doymadan kalkmak aslında adabdır. Yemekler arası en az 4-5 saat olmalıdır. Her yemekde çok aşırıya kaçılmamalıdır. Şifa hazımdadır. Bu nedenle hazmedebileceğimiz kadar yemeliyiz.

Bugün dünyada ve ülkemizde insanların bu denli itinasızlığının temel sebebi yanlış beslenmedir. Sağlam beyinli toplum dogru düşünür ve vicdan sahibi olur. Cevresel faktörlerinde beynin gelişimine büyük etkisi var. İnsan yaşadığı çevrenin ürünüdür. Dalton zekanın kanıtsal olduğunu söylemiştir. Amma çevresel faktörlerinde rolu hadsiz çokdur. Amma zekanın hem genetik hemde çevresel olduğu kabul görmüştür. Ailemizden aldığımız genetik kod sadece bir başlangıçtır. Bu kodla biz bir hayata yola çıkıyoruz. Bu kod nasıl bir ortamla karşılaşarsak, yaşam sırasında ne tip deneyimler yaşıyorsak, ne yiyorsak, ne içiyorsak, yaşadığımız yerin iklimi , döngüsü, saat dilimleri nasılsa, içinde bulunduğumuz kültürün kodları bize nasıl etkiler yapıyorsa gibi sayısız faktörden etkilenecek ortaya çıkan etkilerin çok değişik olmasına sebep oluyor.

SONUÇ

Toparlamış olursak doğru toplum için sağlam beyinli bireylerin yetişmesi gereklidir. Sağlam beyinse önce sağlam vücutta, daha sonra ise sağlam ailede olur. Sağlam aileninse temelini güçlü anneler temenni eder. Bunun için toplumumuzda eğitim mutlakdır. Özellikle kızlarımız

için. Bilgili bir anne yukarıda saydığım tüm eylemleri harekete geçirerek topluma doğru düşünen , vicdanlı, lyakatlı ferdler yetiştirecek.

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**CYTOTOXIC ACTIVITY OF *DITTRICHIA VISCOSA* PLANT EXTRACT IN HEPG2
AND HEK293 CELL LINES****KADIOGLU DALKILIÇ**

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ORCID ID: <https://orcid.org/0000-0002-6892-247X>**ABSTRACT**

Plants offer a wide therapeutic spectrum with various biological effects. The utilization of medicinal plants to address primary healthcare needs is a pervasive practice on a global scale, with more than 80% of the world's population depending on these natural resources to fulfill their health-related needs. Medicinal plants have a rich history of use in treating various diseases, and recent research has focused on their active compounds and therapeutic potential, including antioxidant, antibacterial, antifungal, antiviral, antiinflammatory, and anticancer properties. Plant extracts are often preferred for their safety, convenience, and effectiveness, allowing for the isolation of desired components in purer and larger quantities. Cancer, characterized by uncontrolled cell division due to disruptions in physiological and molecular processes, is a complex disease. Traditional treatments like surgery, chemotherapy, and radiotherapy can harm healthy cells. However, the search for potent and non-toxic anticancer drugs from environmentally friendly plant sources has led to the emerging field of plant-based nanoscience in cancer treatment.

One of these plants, *Dittrichia viscosa*, known for its anti-inflammatory, antimicrobial, anticancer, and antidiabetic potential, is a perennial herb and belongs to the Asteraceae family. In this study, the cytotoxic effects of *D. viscosa* on Human Liver Cancer (HEPG2) and Human Embryonic Kidney 293 (HEK293) cell lines were investigated. *D. viscosa* was prepared in four different concentrations using methanol and hexane solvents. These concentrations were then applied to HepG2 and HEK293 cell lines using the MTT assay. According to the results obtained, the extract prepared with methanol showed 92.5% cytotoxicity at a concentration of 250 µg/ml in the HepG2 cell line, while 91% cytotoxicity was observed at a concentration of 250 µg/ml of the extract prepared with hexane in the HEK293 cell line. As a result, relatively limited cytotoxic effects were observed in both cell lines.

KEYWORDS: Cytotoxic activity; Cell lines, Gene expression; *D. Viscosa*.***Dittrichia viscosa* Bitki Özütünün HepG2 ve HEK293 Hücre Hatlarında Sitotoksik Aktivitesi****ÖZET**

Bitkiler, çeşitli biyolojik etkilere sahip geniş bir terapötik spektrum sunmaktadır. Temel sağlık ihtiyaçlarını karşılamak için tıbbi bitkilerin kullanımı küresel ölçekte yaygın bir uygulamadır ve dünya nüfusunun %80'inden fazlası sağlıkla ilgili ihtiyaçlarını karşılamak için bu doğal kaynaklara güvenmektedir. Şifalı bitkiler çeşitli hastalıkların tedavisinde zengin bir kullanım

geçmişine sahiptir ve son araştırmalar antioksidan, antibakteriyel, antifungal, antiviral, antiinflamatuvar ve antikanser özellikleri de dahil olmak üzere aktif bileşiklerine ve terapötik potansiyellerine odaklanmıştır. Bitki özleri genellikle güvenlikleri, uygunlukları ve etkinlikleri nedeniyle tercih edilir ve istenen bileşenlerin daha saf ve daha büyük miktarlarda izole edilmesine olanak tanır. Fizyolojik ve moleküler süreçlerdeki bozulmalar nedeniyle kontrolsüz hücre bölünmesi ile karakterize edilen kanser, karmaşık bir hastalıktır. Ameliyat, kemoterapi ve radyoterapi gibi geleneksel tedaviler sağlıklı hücrelere zarar verebilir. Bununla birlikte, çevre dostu bitki kaynaklarından güçlü ve toksik olmayan antikanser ilaçların araştırılması, kanser tedavisinde bitki bazlı nanobilim alanının ortaya çıkmasına yol açmıştır.

Bu bitkilerden biri olan ve anti-enflamatuvar, antimikrobiyal, antikanser ve antidiyabetik potansiyeli ile bilinen *Dittrichia viscosa*, çok yıllık bir bitkidir ve Asterecae ailesine aittir. Bu çalışmada, *D. viscosa*'nın İnsan Karaciğer Kanseri (HEPG2) ve İnsan Embriyonik Böbrek 293 (HEK293) hücre hatları üzerindeki sitotoksik etkileri araştırılmıştır. *D. viscosa*, metanol ve hekzan çözücülerini kullanılarak dört farklı konsantrasyonda hazırlanmıştır. Bu konsantrasyonlar daha sonra MTT deneyi kullanılarak HepG2 ve HEK293 hücre hatlarına uygulanmıştır. Elde edilen sonuçlara göre, HepG2 hücre hattında metanol ile hazırlanan ekstraktın 250 µg/ml konsantrasyonunda %92.5 sitotoksikite gösterdiği, HEK293 hücre hattında ise hekzan ile hazırlanan ekstraktın 250 µg/ml konsantrasyonunda %91 sitotoksikite gözlemlendi. Sonuç olarak her iki hücre hattı üzerinde nispeten sınırlı sitotoksik etkiler ortaya çıkmıştır.

ANAHTAR KELİMELELER: Sitotoksik aktivite; Hücre hatları, Gen ifadesi; *D. Viscosa*.

**INVESTIGATION OF CYTOTOXIC EFFECTS OF *TRAGOPOGON RETICULATUS*
ON HEPG2 AND MCF7 CELL LINES AND ANTIOXIDANT AND
ANTIMICROBIAL EFFECTS AGAINST SOME MICROORGANISMS****KADIOGLU DALKILIÇ**

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ORCID ID: [https://orcid.org/ 0000-0002-6892-247X](https://orcid.org/0000-0002-6892-247X)**ABSTRACT**

Plants have been used for various purposes throughout history. This subject has received increasing attention in the field of traditional medicine in recent years. *Tragopogon reticulatus*, as a forage grass plant in turkey, is a species that stands out with rich vitamin and mineral content. The aim of this study was to investigate the antimicrobial, antioxidant, and cytotoxic activities of *T. reticulatus*. Two separate extracts were prepared at different concentrations using hexane and methanol solvents obtained from the *T. reticulatus* plant, and cytotoxic activity was evaluated by the MTT Assay (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide) method on human liver cancer (HepG2) and human breast cancer (MCF7) cell lines. The antioxidant activity of the extracts obtained from methanol and hexane was determined by the DPPH (2,2-diphenyl 1-picrylhydrazyl) radical scavenging capacity method. Antimicrobial activity was evaluated by the disk diffusion method, and bacteria such as *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Escherichia coli*, *Bacillus megaterium*, and *Candida albicans* fungus were used in the study.

The hexane extract obtained from the *T. reticulatus* plant showed a high cytotoxic activity of 44% in the MCF7 cell line, while it showed a 51% dead cell count in the HepG2 cell line. When the antioxidant results were evaluated, it was determined that the DPPH radical scavenging effect of the hexane extract exhibited the most effective activity at 19%. When the antimicrobial results were evaluated, it was determined that the concentrations prepared with hexane exhibited the most effective activity with a zone diameter of 16 mm against *B. megaterium*. These findings suggest that *T. reticulatus* plant extracts can be considered as a potential source. These results may shed light on future research into the biological effects of the plant and contribute to the development of new treatment methods.

KEYWORDS: *Tragopogon reticulatus*; Cytotoxic, Antimicrobial; Antioxidant activity.

HepG2 ve MCF7 Hücre Hatları Üzerinde *Tragopogon reticulatus*'un Sitotoksik Etkilerinin ve Bazı Mikroorganizmalara Karşı Antioksidan, Antimikrobiyal Etkilerinin Araştırılması

ÖZET

Bitkiler tarihsel süreç içerisinde çeşitli amaçlarla kullanılmıştır. Bu konu son yıllarda geleneksel tıp alanında giderek artan bir ilgi görmektedir. *Tragopogon reticulatus*, Türkiye'de yemlik ot bitkisi olarak bilinen, zengin vitamin ve mineral içeriği ile dikkat çeken bir türdür. Bu çalışmanın amacı, *T. reticulatus* bitkisinin antimikrobiyal, antioksidan ve sitotoksik aktivitelerini araştırmaktır. *T. reticulatus* bitkisinden elde edilen hekzan ve metanol çözücülerinin kullanılmasıyla farklı konsantrasyonlarda iki ayrı ekstrakt hazırlanmış, sitotoksik aktivite ise insan karaciğer kanseri (HepG2) ve insan meme kanseri (MCF7) hücre hatları üzerinde MTT Assay (3-(4,5-dimetiltiazol-2-il)-2,5-difenil tetrazolyum bromür) yöntemiyle değerlendirilmiştir. Metanol ve hekzandan elde edilen ekstraktların antioksidan aktivitesi DPPH (2,2-difenil 1-pikrilhidrazil) radikal süpürme kapasitesi yöntemi ile belirlenmiştir. Antimikrobiyal aktivite disk difüzyon yöntemi ile değerlendirilmiş ve çalışmada *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Escherichia coli* ve *Bacillus megaterium* gibi bakteriler ve *Candida albicans* mantarı kullanılmıştır.

T. reticulatus bitkisinden elde edilen hekzan ekstresi, MCF7 hücre hattında %44 oranında yüksek sitotoksik aktivite gösterirken, HepG2 hücre hattında %51 oranında ölü hücre sayısı göstermiştir. Antioksidan sonuçlar değerlendirildiğinde, hekzan ekstresinin DPPH radikal süpürücü etkisinin %19 ile en etkili aktiviteyi sergilediği belirlenmiştir. Antimikrobiyal sonuçlar değerlendirildiğinde hekzan ile hazırlanan konsantrasyonların *B. megaterium*'a karşı 16 mm zon çapı ile en etkili aktiviteyi sergilediği belirlenmiştir. Bu bulgular, *T. reticulatus* bitki ekstraktlarının potansiyel birer kaynak olarak kabul edilebileceğini göstermektedir. Bu sonuçlar, bitkinin biyolojik etkilerine dair gelecekteki araştırmalara ışık tutabilir ve yeni tedavi yöntemlerinin geliştirilmesine katkıda bulunabilir.

ANAHTAR KELİMELE: *Tragopogon reticulatus*, Sitotoksik, Antimikrobiyal; Antioksidan aktivite.

SYNTHESIS AND CHARACTERIZATION OF METAL MOLYBDATE NANOPARTICLES AND ITS APPLICATION IN THE REDUCTION REACTION OF THE THREE ISOMERS OF NITROPHENOL

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ABSTRACT

Nickel molybdate is among the most studied ternary oxides in the family AMoO_4 (A is a transition element or a divalent metal from the alkaline earth column). According to the literature, NiMoO_4 possesses five allotropic forms α , β , γ , δ and ϵ depending on the synthesis conditions, the temperature and the pressure. Indeed, under atmospheric pressure, the nickel molybdate can be detected in two crystalline forms. In fact, it can be in the stable form located at a medium high temperature, α - NiMoO_4 , in which Mo is tetrahedrally coordinated, or it can have an octahedral coordination in the metastable low temperature (below 190K) form, γ - NiMoO_4 .

In this work, we synthesized α - NiMoO_4 in the solid state utilizing a new and simple process, without resorting to any solvent at relatively low temperature. The as-prepared nickel molybdate nanopowders were readied through calcination of an oxalate complex in static air at 550°C . The oxalate complex was investigated by TGA and FTIR spectroscopy. The as-readied α - NiMoO_4 was characterized by XRD, and BET technique. Its catalytic effectiveness was verified in the reduction reaction of the nitrophenol isomers. The nickel molybdate exhibits exceptionally high reduction reaction of the three isomers of nitrophenol to the three corresponding aminophenol isomers.

KEYWORDS: ternary oxides, oxalate complex, nickel molybdate nano powders, Reduction of nitrophenol.

EFFECT OF WASTE PLASTIC AND RUBBER ON MECHANICAL PROPERTIES OF CONCRETE: A REVIEW

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ABSTRACT

Every year, approximately 6.5 billion tons of plastic and rubber waste are produced worldwide, and their production is still rising. About 21% of these wastes have been recycled for use in civil engineering projects. This review paper was conducted to compare previous research that studied the effects of these wastes on concrete with different rations for 5%, 10%, 15%, 20%, and 25% in concrete. It was observed that the compressive strength decreased when increasing the percentage of plastic and rubber compared to the control mix.

KEYWORDS: rubber, plastic, performance, substitution, waste.

**IDENTIFICATION AND PATHOGENICITY DETERMINATION OF FUNGI
RESPONSIBLE FOR SPOILAGE IN STORED ORANGES (*CITRUS SINENSIS*) IN
IPATA MARKET, ILORIN, NIGERIA**

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ABSTRACT

The study was carried out in Ipata Market, Ilorin, Nigeria, to identify fungi responsible for spoilage in stored oranges, and to test for the ability of the isolated fungi to infect fresh oranges. A total of ninety samples of fresh sweet oranges (*Citrus Sinensis*) were used. First, a total of sixty samples were obtained from three different points at Ipata Market, Ilorin, and transported immediately to Al-Hikmah University microbiology laboratory for analysis. The oranges were kept under room temperature and observed after two weeks for spoilage. The samples were cut from lesion and then disinfected with ethanol for 2 minutes. One ml of the disinfected samples was mashed and then transferred into a test tube containing 9 ml of distilled water and stirred to homogenize. After 7 days of incubation at 25 - 30°C, fungal colonies were counted and recorded on plates of already prepared Potato Dextrose Agar (PDA) containing Streptomycin (30mg/l) to prevent the growth of bacteria. Fresh sweet orange fruits (thirty samples, ten each from different locations in the market) were obtained, and the isolated culture for each of the identified fungi specie inoculated on each of the freshly purchased oranges and incubated to check for their spoilage ability. A total of eight fungal species belonging to five different genera were isolated and identified. The isolates are *Aspergillus niger*, *Penicillium digitatum*, *Aspergillus flavus*, *Yeast*, *Rhizopus stolonifer*, *Aspergillus clavatus*, *Mucor* species and *Penicillium chrysogenum*. *Aspergillus* specie had the highest percentage occurrence (37.5%), followed by *Penicillium* species (25%), with *Yeast*, *Mucor* species, and *Rhizopus* species having the least percentage occurrence of 12.5%. Out of all the isolated fungi, *Aspergillus niger* was highly pathogenic leading to rapid disintegration of treated fruits in 3 – 5 days while *Mucor* and *Yeast* sp were moderately pathogenic, and *Penicillium* sp and *Rhizopus* sp has no pathogenic effect of rot on fruits. The mycological assessment revealed that all spoilt sweet oranges harbored microorganisms which are either of pathogenic, food poisoning, food spoilage or of epidemiological and economical importance.

KEYWORDS: *Citrus Sinensis*, Fungal analysis, frequency of occurrence, pathogenic.

CALCULATING HEALTH AND ECOLOGICAL RISKS OF PM_{2.5}, AND LEAD POLLUTANTS EXPOSURE AMONG COMMUNITIES DUE TO CEMENT PLANT EMISSION, MAROS INDONESIA 2023

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ABSTRACT

This study assessed the possible impacts of PM_{2.5}, and Lead exposures on populations and ecology as a result of breathing contaminated air and contaminated soil exposure near the Bosowa cement mill in Maros, Indonesia in 2023.

Anthropogenic and lithogenic activities can lead to an increase in the amount of heavy metals in ambient air and in soil as well as a decline in the quality of the environment.

The magnitude of PM_{2.5}, and Lead were measured during the period of April-June 2023. The level of PM_{2.5} on ambient air sampling was conducted using direct reading HAZ-Dust EPAM 5000, uses a laser analyzer in order to measure particulate level matter. The result or time-weighted average (TWA) value directly can be read after the measurement at the site. Then meteorological data was collected from Indonesia Agency for Meteorology, Climatology, and Geophysics online database. Then, lead concentrations on surface Soil were taken and analyzed using AAS. Potential ecological and human health risks.

Station 9 had the highest level of PM_{2.5} concentration (98.23 g/m³), followed by station 11 (97.14 g/m³). In comparison, station 3 had the lowest amount at (31.24 g/m³) and station 5 had the highest level at 32.91 g/m³, respectively. Additionally, station 10 had the greatest amount of Pb air particulate concentration, followed by station 11 with 88.33 g/m³, while station 6 had the highest level of Pb in surface soil, at 196.90 and 166.91 mg/g, respectively. In comparison, station 15 had the lowest amount at (54.76 mg/g), and station 14 had the highest level at (88.87 mg/g), respectively.

The findings implied that both PM_{2.5} and Pb have medium risks to exposed communities. It could be valuable for managing the air quality due to the industry activities and soil remediation in residential areas.

KEYWORDS: PM_{2.5}, lead, air particulate, surface soil, ecological risk and health risk.

THE BENEFICIAL ROLE OF PHYTOCHEMICALS ON OXIDATIVE STRESS: A REVIEW

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ABSTRACT

Greeneries are the main source of biologically active phytochemicals. Numerous work done by old and recent researchers in the previous years have shown that phytochemicals generally play a principal role in the protection of human health. Oxidative stress is known to be involved in the pathogenesis of lifestyle-related diseases, including, hypertension, diabetes mellitus, atherosclerosis, ischemic diseases, and malignancies. It has been described as harmful because oxygen free radicals attack biological molecules such as lipids, proteins, and DNA. Plant phytochemicals are potent antioxidants against reactive oxygen species and have several health benefits ranging from aiding the function of the immune system, to protecting the cells and DNA from damage, to reducing inflammation, to regulation of hormones and lots more. The major classes of phytochemicals include alkaloids, phenolics, terpenoids, flavonoids, saponins, tannins etc. Each class of these potent agents consists of a broad range of chemicals with diverse strengths.

KEYWORDS: Phytochemicals, Oxidative Stress, Free radicals, Antioxidants, Pathogenesis.

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Tokyo 8. Uluslararası, Yenilikçi Çalışmalar Ve Modern Bilimsel Araştırmalar Kongresi, 12-14 Ocak 2024, tarihleri arasında Tokyo, Japonya'da 19 farklı ülkenin akademisyen/araştırmacılarının katılımıyla gerçekleşmiştir. Kongre kapsamında sunumu yapılan 128 bildirinin 61 adeti Türkiye'den katılımcılar tarafından; 67 bildiri ise 18 ülkeden katılımcılar tarafından sunulmuştur. 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



Dr. Mustafa Latif Emek
On behalf of the Organizing Committee



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