An aerial, black and white photograph of the Manhattan skyline in New York City, showing a dense cluster of skyscrapers and buildings. The image is used as a background for the book cover.

**10th INTERNATIONAL NEW YORK
CONFERENCE ON
EVOLVING TRENDS IN
INTERDISCIPLINARY
RESEARCH & PRACTICES**

June 1-3, 2024
Manhattan, New York City

Editors
David Wortley
Emhemed Khalifa Gerish

Proceeding Book

Issued: 24.06.2021
ISBN: 978-625-367-739-8

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IKSAD Publications - 2024©

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CONFERENCE ID

CONFERENCE TITLE

10th INTERNATIONAL NEW YORK CONFERENCE ON EVOLVING
TRENDS IN INTERDISCIPLINARY RESEARCH & PRACTICES

DATE AND PLACE

June 1-3, 2024 / Manhattan, New York City

ORGANIZATION

IKSAD INSTITUTE

EDITORS

David Wortley

Emhemed Khalifa Gerish

PARTICIPANTS COUNTRY (33 countries)

USA, TÜRKİYE, PAKISTAN, ETHIOPIA, POLAND, BRAZIL, SLOVAKIA, SPAIN,
ALBANIA, TURKISH REPUBLIC OF NORTHERN CYPRUS, HUNGARY, UNITED
KINGDOM, KOSOVO, MOROCCO, ALGERIA, SLOVENIA, GEORGIA, INDIA,
AZERBAIJAN, LEBANON, NORTH MACEDONIA, GHANA, ROMANIA, BURUNDI,
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INDONESIA, BENIN, SAUDI ARABIA

Total Accepted Article: 110

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Accepted Article (Türkiye): 29

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Sindh Madressatul Islam University (SMIU), Karachi,
Pakistan


ZHI Huan
Minzu University

Seda HADZIBULIC
Northeastern Illinois University

PHOTO GALLERY

The screenshot shows a Zoom meeting in progress. The top bar displays the meeting title "NPK Conference - Saved to this PC" and the time "09:08:40". The meeting participants list includes "observer h1", "H-1, Sanchita Paul", "Iva Sulaj", "Hall-1, Vègh Mark", "Hall-1, Katarina Smakic", and "The-Hung NGUYEN". The main content is a presentation slide with the following text:

IMPACT OF AYODHYA'S RAM MANDIR TOURISM ON LOCAL ECONOMIES AND INFRASTRUCTURE DEVELOPMENT: A CASE STUDY



Sanchita Paul¹, Dr. H. R. Laskar²

¹Assam University Silchar, Research Scholar, Department of Business Administration, Silchar, India.
²Assam University Silchar, PhD Supervisor and Senior Faculty Member, Department of Business Administration, Silchar, India.

The slide is presented in a software interface with various toolbars for editing and navigation. The bottom of the screen shows the Windows taskbar with the time "17:46".

The screenshot shows a Zoom meeting grid with six participants. The top bar displays the meeting title "NPK Conference - Saved to this PC" and the time "08:56:55". The participants are:

- Summayya Ansari Hall-2 Ivan PAVLOVIC
- Observer Hall-2
- H-2- Vlad Diaconescu
- Hall 2 Dr.Gulsah... (Hall 2 Dr.Gulsah Kaya Karasu)
- rashi jha Hall-2 Ivan PAVLOVIC
- Nguyen Van Thi... (Nguyen Van Thien An)
- Omar Ansari
- Fatima SOLTANI

The bottom of the screen shows the Windows taskbar with the time "17:58".

PHOTO GALLERY

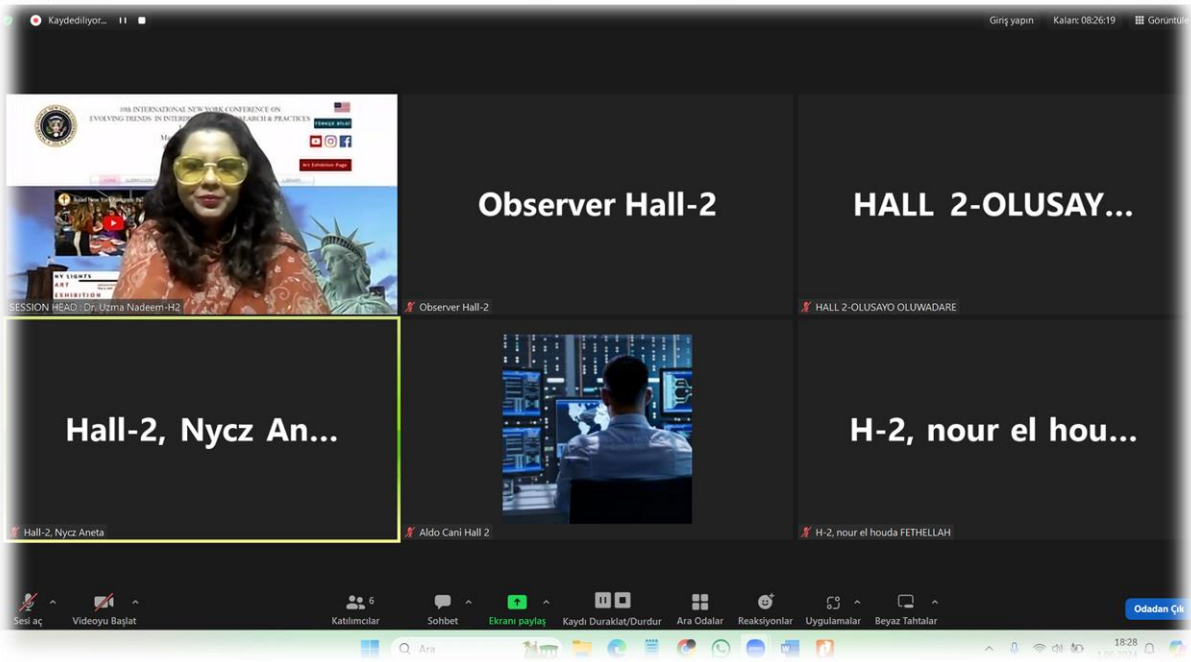


PHOTO GALLERY

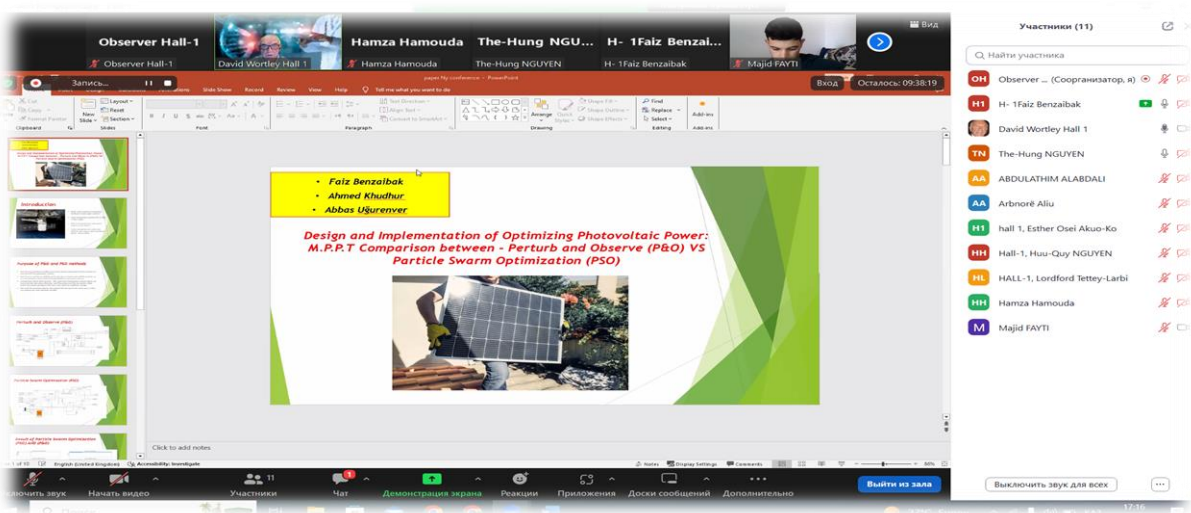


PHOTO GALLERY

Materials and Methods

Included Articles

- NORM residues used in concrete were included;
- Proportionate inclusion on NORM residue in cement were included;
- Possible means/methods of reducing the activity concentration in NORM residue were included
- Captures all the radiological hazard indices

Excluded Articles

- with radium equivalent results were excluded;
- with only radon and thoron indices were excluded;
- lacking the proper description of methods employed were excluded to avoid the misinterpretation of the results and misleading conclusions; and
- Missing the details of the location of the investigation were ignored.

The slide also features a 3D illustration of a person sitting at a desk with various data charts and graphs on the wall.

Diet and Nutrition Technologies in Personalised Preventative Healthcare

David Wortley FRSA
VP International Society of Digital Medicine

The slide features a circular portrait of David Wortley and a background image of a DNA double helix.

PHOTO GALLERY

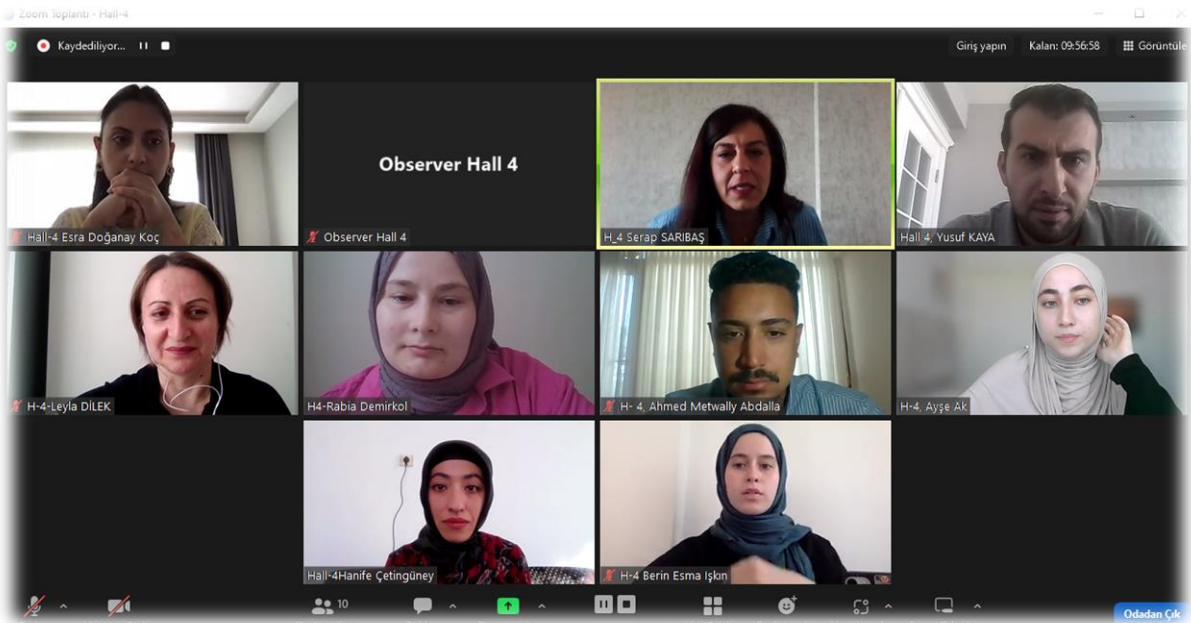
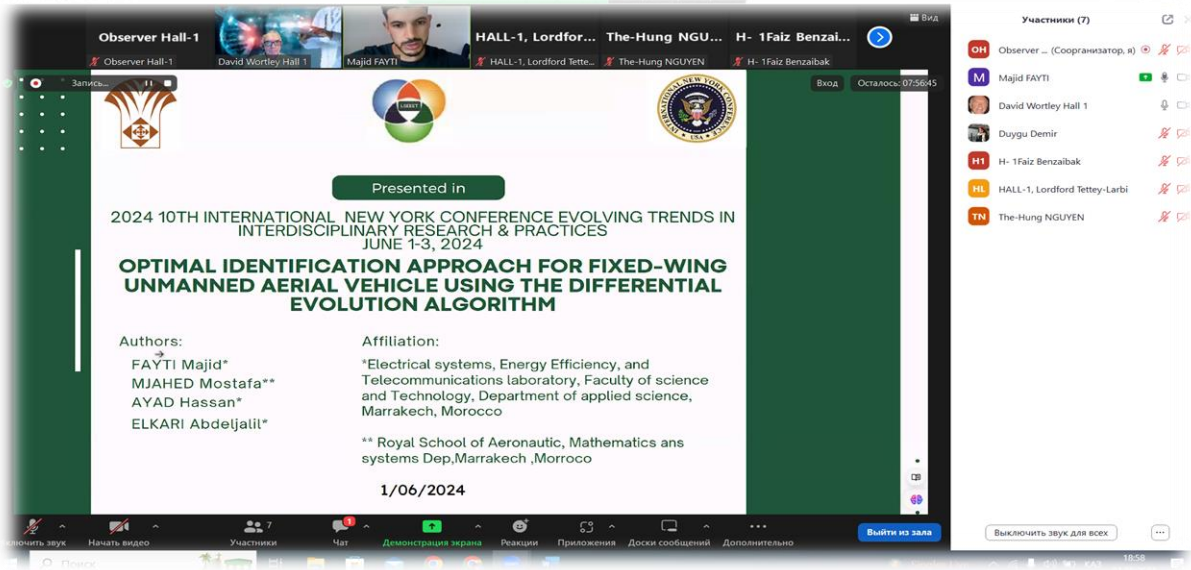


PHOTO GALLERY

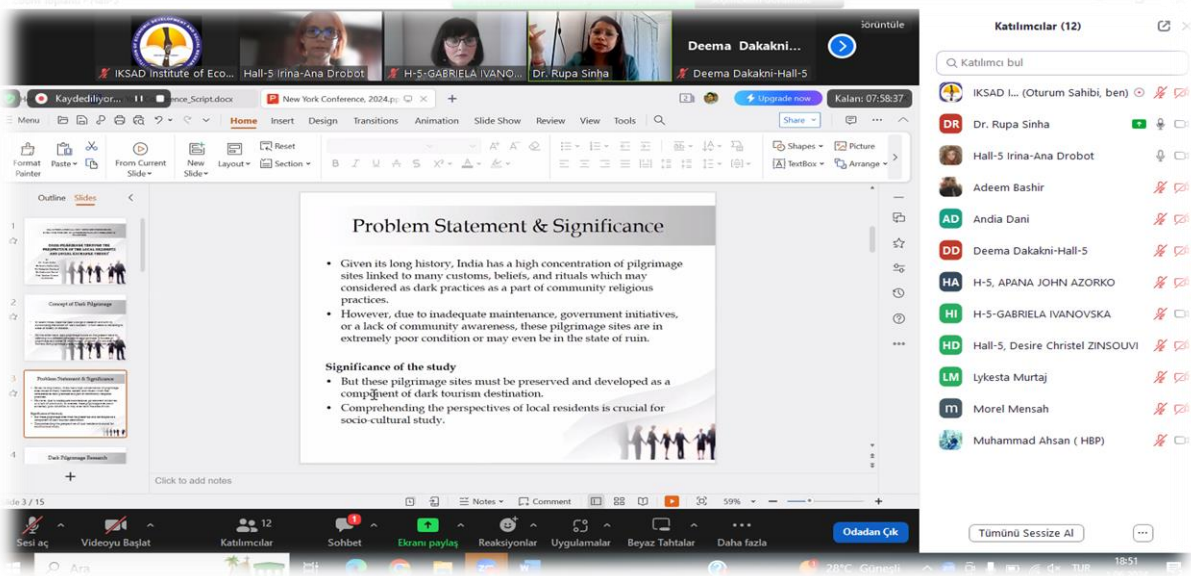
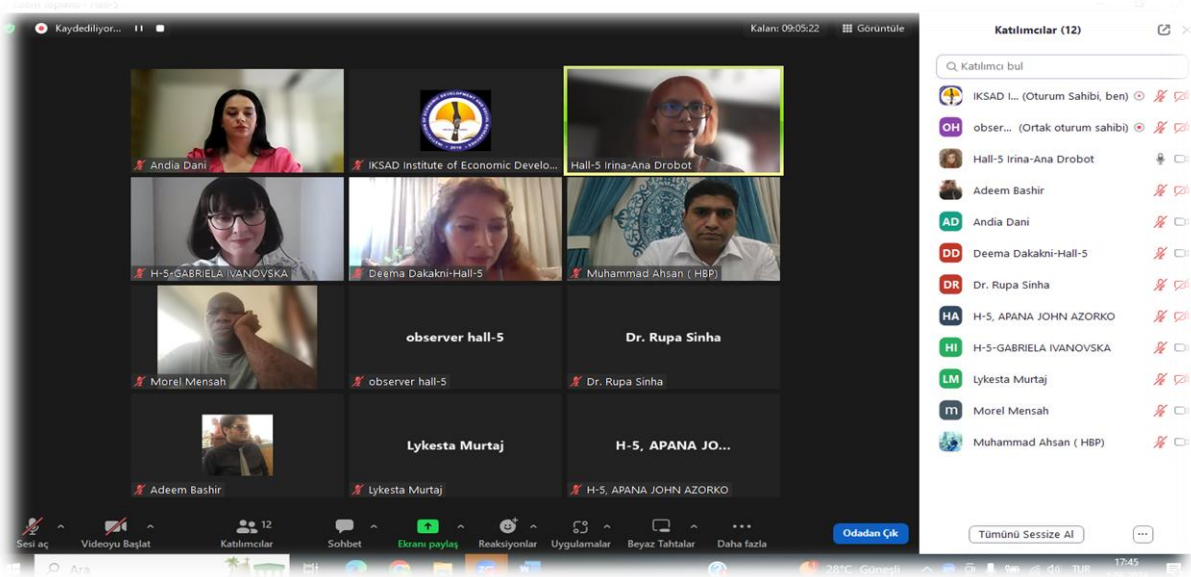


PHOTO GALLERY



PHOTO GALLERY

Observer Hall-6

H- 6, Irida Ikon... H-6,Prof.Abiyev...

Observer Hall-6 HALL-6, Nesti Binishi HALL-6 Jonida Balla Mod... H- 6, Irida Ikonomi H... H-6,Prof.Abiyev Huseyn

Запись... Выход Осталось: 09:44:53

In the realm of **sports performance**, blood **biomarker testing** is a window inside the athlete's body. A comprehensive and specific performance set of biomarkers should include **key markers** to assess at least:

- (a) nutrition and metabolic health,
- (b) hydration status,

Участники (8)

Найти участника

- OH Observ... (Соорганизатор, я)
- HALL-6 Jonida Balla Moderator
- H6 H- 6, Irida Ikonomi Hoxha
- HH H-6,Prof.Abiyev Huseyn
- A Hall-6 Dr. Ayan Mammadova
- E Hall-6, Dr. Ebru Elif DURMAZ
- HN HALL-6, Nesti Binishi
- OK Olta Kapllani

Выключить звук для всех

Выйти из зала

Observer Hall-6

H-6,Prof.Abiyev...

HALL-6, Nesti Binishi Observer Hall-6 HALL-6 Dr. Ayan Mam... HALL-6 Jonida Balla Mod... H-6,Prof.Abiyev Huseyn

Запись... Выход Осталось: 08:25:34

Olta Kapllani - 2024.pptx - Microsoft PowerPoint

Sectors of tourism industry

- Food and beverage industry
- Travel and tourism industry
- Accommodation
- Meetings and events
- Recreation Industry

Участники (11)

Найти участника

- OH Observ... (Соорганизатор, я)
- OK Olta Kapllani
- HALL-6 Jonida Balla Moderator
- Duygu Demir
- H6 H- 6, Irida Ikonomi Hoxha
- HH H-6,Prof.Abiyev Huseyn
- A Hall-6 Dr. Ayan Mammadova
- E Hall-6, Dr. Ebru Elif DURMAZ
- HN HALL-6, Nesti Binishi
- Khanh Hung Nguyen
- NK Nguyen Khanh Hung

Выключить звук для всех

Выйти из зала

PHOTO GALLERY

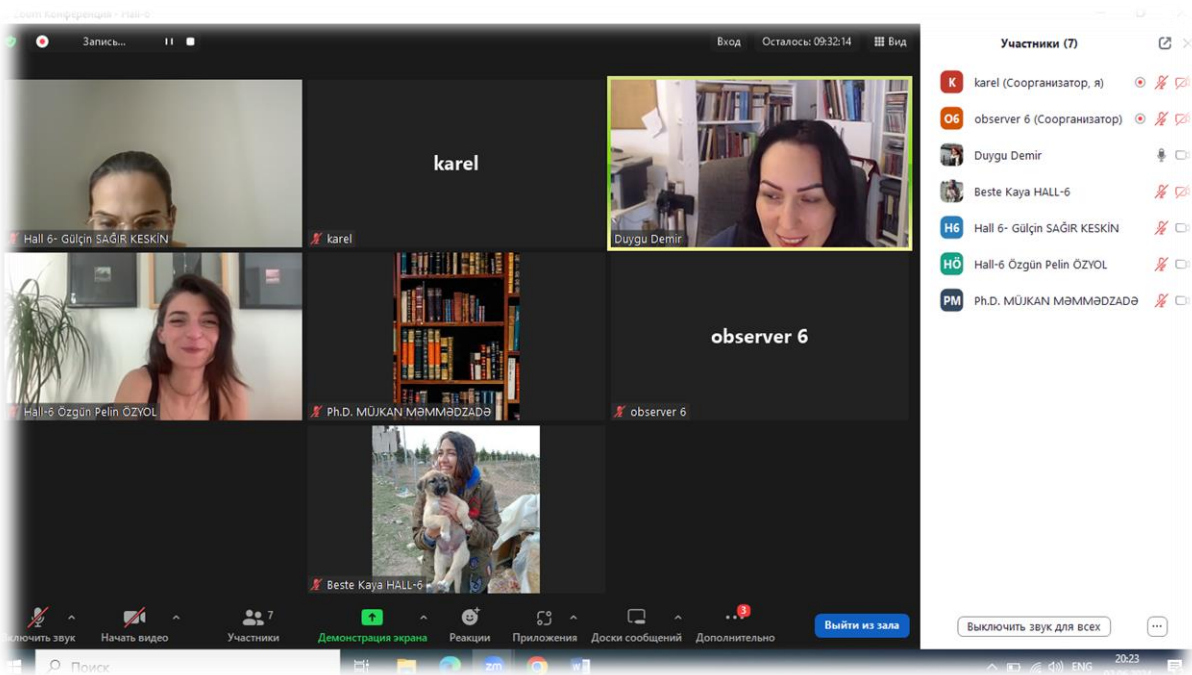
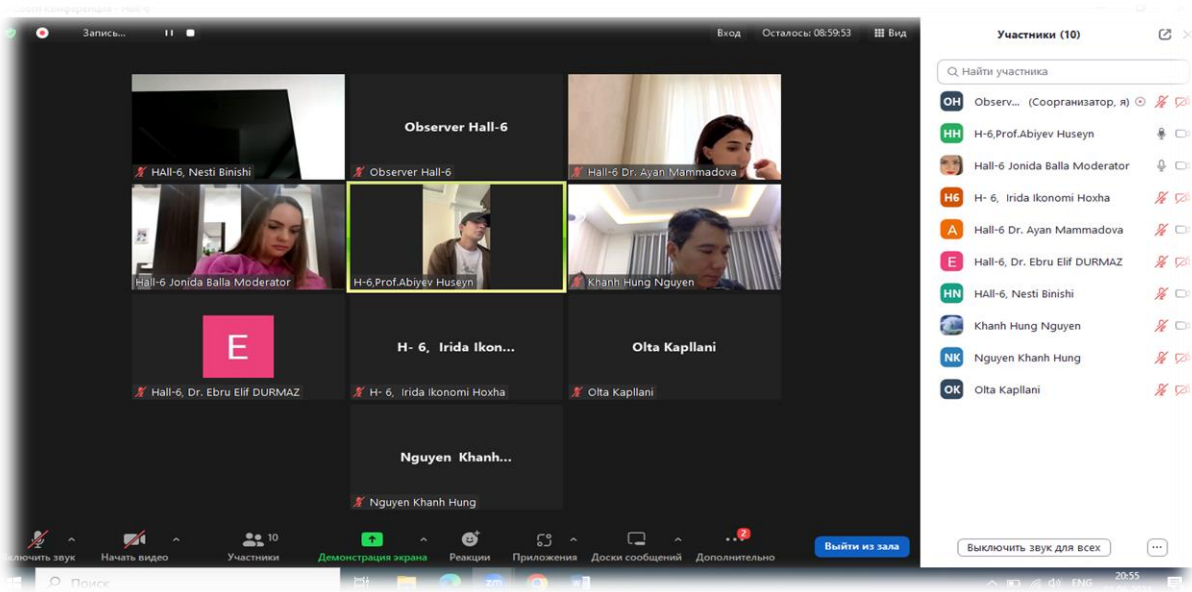


PHOTO GALLERY



**10th INTERNATIONAL NEW YORK CONFERENCE ON
EVOLVING TRENDS IN INTERDISCIPLINARY
RESEARCH & PRACTICES**



**CONFERENCE
PROGRAM**

**Meeting ID: 849 0099 9859
Passcode: 226515**

**June 1-3, 2024
Manhattan, New York City**

Zoom Meeting ID: 849 0099 9859
Zoom Passcode: 226515

**10th INTERNATIONAL NEW YORK CONFERENCE ON
EVOLVING TRENDS IN INTERDISCIPLINARY
RESEARCH & PRACTICES**

Participant Countries: (33)

USA, Türkiye, Pakistan, Ethiopia, Poland, Brazil, Slovakia, Spain, Albania, Turkish Republic of Northern Cyprus, Hungary, United Kingdom, Kosovo, Morocco, Algeria, Slovenia, Georgia, India, Azerbaijan, Lebanon, North Macedonia, Ghana, Romania, Burundi, Serbia, Russia, Netherlands, Vietnam, Greece, West Africa, Indonesia, Benin, Saudi Arabia.

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- ❖ The application works on tablets, phones and PCs.
- ❖ The participant must be connected to the session 5 minutes before the presentation time.
- ❖ All congress participants can connect live and listen to all sessions.
- ❖ Moderator is responsible for the presentation and scientific discussion (question-answer) section of the session.

Points to Take into Consideration - TECHNICAL INFORMATION

- ◆ Make sure your computer has a microphone and is working.
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- ◆ Requests such as change of place and time will not be taken into consideration in the congress program.

**Before you login to Zoom please indicate your name surname and hall number,
exp. H- 1, Hamza Hamouda**

ZOOM LINK:

<https://us02web.zoom.us/j/84900999859?pwd=TGxvRUh0QIE5eWFXdm9MZU5ZVDdxdz09>



Zoom Meeting ID: 849 0099 9859
Zoom Passcode: 226515

10th INTERNATIONAL NEW YORK CONFERENCE

NY Lights ART EXHIBITION

June 1-3, 2024
Manhattan, New York City

Online & In Person Exhibition



3. NYLights ART EXHIBITION

by IKSAD

June 1-3 **2024**

Application Deadline: May 5, 2024
www.nyconference.org/artnewyork
info@nyconference.org

  **HALIC**
ÜNİVERSİTESİ
Fine Arts Faculty

PINELO
art gallery

 **AWITA**

Venue:
Awita New York Studio
Gallery NYC, USA



ART	ARTIST
<i>Lights of Istanbul</i>	<i>Laçin AKYIL</i>
<i>Duality: The Natural</i>	<i>Yakut ÇINAR</i>
<i>Duality: The Artificial</i>	<i>Yakut ÇINAR</i>
<i>The Fish Looking for its Half</i>	<i>Meltem SARUL</i>
<i>To Take Refuge</i>	<i>Zehra ÇALIŞKAN</i>
<i>Sığınma</i>	<i>Zehra ÇALIŞKAN</i>



Zoom Meeting ID: 849 0099 9859
Zoom Passcode: 226515

IN PERSON SESSION

01-06-2024

New York Local Time: 13:00–15:00

Venue: Awita New York Studio, Brooklyn

HEAD OF SESSION: Muntazar MEHDI

Authors	Affiliation	Presentation title
Katarzyna Nowicka	<i>SGH Warsaw School of Economics, Poland</i>	DIGITAL CIRCULAR SUPPLY CHAIN MANAGEMENT
Slavka Demuthova Andrej Demuth	<i>University of Ss. Cyril and Methodius, Slovakia Comenius University, Slovakia</i>	HOW AGE AFFECTS THE EVALUATION OF THE CONCEPT OF BEAUTY
Yitbarek Takele Bayiley	<i>Addis Ababa University, Ethiopia</i>	THE RELATIONSHIP BETWEEN GREEN ENTREPRENEURIAL ORIENTATION AND GREEN INNOVATION PERFORMANCE IN START-UP FIRMS: THE MEDIATION ROLE OF DYNAMIC CAPABILITY AND ENVIRONMENTAL MANAGEMENT CAPABILITY
Muntazar Mehdi Maaz Hussain Syeda Malika Zahra	<i>National University of Modern Languages Islamabad, Pakistan</i>	PERCEPTIONS OF STUDENTS ON GENDER: A FEMINIST CRITICAL DISCOURSE ANALYSIS OF SECOND LANGUAGE CLASSROOM IN PAKISTAN
Erblin Xhoka Elda Hidri	<i>University of Tiranes, Albania Universiteti Buqesor, Albania</i>	MEASURING FINANCIAL FAILURES OF COMPANIES INCLUDED IN THE DOWJONES30 INDEX TRADED ON THE UNITED STATES EXCHANGE
Carmen Mayolas-Pi Alejandro Legaz-Arrese	<i>University of Zaragoza, Spain Human Movement Research Group, Spain</i>	ANXIETY AND DEPRESSION SYMPTOMS IN ADOLESCENTS AT RISK OF EXERCISE ADDICTION
Emre Birinci	<i>Anadolu University, Türkiye</i>	LONELINESS LEVELS AND SOCIAL SUPPORT PERCEPTIONS OF OLDER ADULTS
Cevat Celep Ayça Kaya	<i>Girne American University, KKTC Haliç University, Türkiye</i>	CULTURAL FOUNDATIONS OF ORGANISATIONAL FAVOURITISM
Prof. Dr. Müge DEMİR	<i>Haliç University, Türkiye</i>	THE EFFECT OF DIGITAL TRANSFORMATION ON UNIVERSITY EDUCATION

(All speakers required to be connected to the session 10 min before the session starts)
Moderator is responsible for ensuring the smooth running of the presentation, managing the group discussion and dynamics.



01.06.2024 | HALL-1



New York Local Time: 10:00–12:30



Ankara Local Time: 17:00–19:30

HEAD OF SESSION: David WORTLEY

Authors	Affiliation	Presentation title
Hamza Hamouda Abduladhim F. Eleabdl Abbas Uğurenver	<i>Istanbul Aydin University, Türkiye</i>	INDEPENDENT HYBRID POWER SYSTEM FOR RURAL AREAS (AL-HENIYAH, LIBYA)
Faiz Benzaibak Ahmed Khudhur Abbas Uğurenver	<i>Istanbul Aydin University, Türkiye</i>	DESIGN AND IMPLEMENTATION OF OPTIMIZING PHOTOVOLTAIC POWER: M.P.P.T COMPARISON BETWEEN - PERTURB AND OBSERVE (P&O) VS PARTICLE SWARM OPTIMIZATION (PSO)
Esther Osei Akuo-ko Lordford Tettey-Larbi Francis Otoo Eric Tetteh Glover Anita Csordás Tibor Kovács	University of Pannonia, Hungary Ghana Atomic Energy Commission, Hungary	EVALUATION OF RADIOACTIVITY CONCENTRATIONS IN SOILS FROM GOLD MINING AREAS IN EASTERN REGION, GHANA
Lordford Tettey-Larbi Esther Osei Akuo-ko Amin Shahrokhi Edit Tóth-Bodrogi Tibor Kovács	<i>University of Pannonia, Hungary</i>	THE CONCEPTION OF RADIOLOGICAL SUSTAINABILITY POSSIBILITIES BY REUTILIZATION OF NORM RESIDUES IN BUILDING MATERIALS
David Wortley	<i>360in360 Immersive Experiences, Alderton, United Kingdom</i>	DIET AND NUTRITION TECHNOLOGIES IN PERSONALISED PREVENTATIVE HEALTHCARE
The - Hung Nguyen Huu - Quy Nguyen Thach Nguyen	<i>The University of Danang, Vietnam Methodist Hospital, Merrillville, USA</i>	NEW SCIENTIFIC DISCOVERIES AND INVENTIONS BASED ON THE SIMILARITY PRINCIPLE IN THE UNIVERSE
Skender Demaku Arbnorë Aliu Donika Sylejmani	<i>University of Pristine 'Hasan Prishtina', Kosovo</i>	DETERMINING THE DEGREE OF WATER, SEDIMENT AND SOIL POLLUTION IN BISTRICA OF KOSOVO, THROUGH THE ICP-OES METHOD
Majid FAYTI Mostafa MJAHEH Hassan AYAD Abdeljalil ELKARI	<i>Electrical systems, Energy Efficiency, and Telecommunications laboratory, Morocco Royal School of Aeronautics, Morocco</i>	OPTIMAL IDENTIFICATION APPROACH FOR FIXED-WING UNMANNED AERIAL VEHICLE USING THE DIFFERENTIAL EVOLUTION ALGORITHM

(All speakers required to be connected to the session 10 min before the session starts)
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01.06.2024 | HALL-2



New York Local Time: 10:00–12:30



Ankara Local Time: 17:00–19:30

HEAD OF SESSION: Dr. Uzma NADEEM

Authors	Affiliation	Presentation title
Zineb Laouina lynda Ouchaouka Mordane Soumia	<i>LMSEIF Laboratory, Morocco Hassan II University Casablanca, Morocco</i>	REMOTE LAB EXPERIMENTS IN MECHANIC: SIMPLE PENDULUM
Nour El Houda Fethellah	<i>Institut Hydrométéorologique de Formation et de Recherche, Algeria</i>	CURRENT INTERNET CACHING VERSUS NDN CACHING
Aldo Cani Aurora Simoni Sofia Cani	<i>Special Prosecution Office against Corruption and Organized Crime, Albania University of Tirana, Albania Albanian National Security Authority, Albania</i>	THE STUDY AND ANALYSIS OF VULNERABILITIES IN COMPUTER SYSTEMS
Petra Cajnko Timi Gomboc	<i>University of Maribor, Slovenia</i>	EMPOWERING INDIVIDUALS: A CATALYST FOR PERSONALIZED CAREER COUNSELING
Oluwadare Olusayo Okike Benjamin	<i>Fayetteville State University, USA University of Abuja, Nigeria</i>	A SECURE ALGORITHM FOR MANAGEMENT OF CLOUD BASED PICTURE ARCHIVING AND COMMUNICATION SYSTEM USING LINEAR FEEDBACK SHIFT REGISTER
Boris Gitolandia Rezo Tedoradze Giorgi Sisvadze Ketevan Urushadze	<i>Georgian Technical University, Georgia</i>	SELECTION OF OPERATIONAL CHARACTERISTICS OF TRUCKS ON THE ROADS OF THE MOUNTAINOUS TERRAIN IN THE TRACECA SECTION OF GEORGIA
Dr. Uzma Nadeem	<i>University of Delhi, India</i>	ECO-FRIENDLY TECHNOLOGIES: BRIDGING DISCIPLINES FOR ENVIRONMENTAL INNOVATION
Aneta Nycz Janusz Skrzypacz Przemysław Szulc	<i>Wroclaw University of Science and Technology, Poland</i>	EXPERIMENTAL STUDY OF THE CENTRIFUGAL PUMP IMPELLER WITH GAP DRAINAGE

(All speakers required to be connected to the session 10 min before the session starts)
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Zoom Meeting ID: 849 0099 9859
Zoom Passcode: 226515

01.06.2024 | HALL-3



New York Local Time: 10:00–12:30



Ankara Local Time: 17:00–19:30

HEAD OF SESSION: Dr. Mammadova Ayan ETIBAR

Authors	Affiliation	Presentation title
Prof. Abiyev Huseyn Azizulla Assoc. Prof. Maharramova Sevinj Huseynbala Assoc. Prof. Aghayeva Asia Haji Dr. Aliyarov Panah Vilayat	Azerbaijan Medical University	HOMEOPATHIC MEDICINE IS A MEDICAL PRACTICE THAT INVOLVES A HOLISTIC, NATURAL APPROACH TO TREATING PATIENTS
Prof. Abiyev Huseyn Azizulla Rzayeva Suraiya Jabbar Badalova Aytac Tahir Dr. Irzayeva Arzu Abaszade Zumrud Amirgulu	Azerbaijan Medical University	PATHOPHYSIOLOGY OF THE ROLE OF EXTERNAL FACTORS IN THE DEVELOPMENT OF PULMONARY EMPHYSEMA
Prof. Abiyev Huseyn Azizulla Dr. Huseynzade Kheyranas Rasif Dr. Ismayilova Konul Idris Dr. Ismayilova Fatma Zakir Dr. Gunel Aliyeva M Dr. Nuriyeva Mehriban Anzor	Azerbaijan Medical University	PATHOPHYSIOLOGY OF DIABETES CAUSED BY IRON DEFICIENCY
Burak Elmas Ender Cem Bulut Sabuhi Alishov Murat Yavuz Koparal Serhat Çetin	Gazi University, Türkiye Kütahya Parkhayat Hospital, Turkey	EVALUATION OF THE EFFICACY OF HOLMIUM: YAG LASER AND THULIUM FIBER LASER IN THE TREATMENT OF URINARY SYSTEM STONES
Zeynep OZKAN Prof. Dr. Ulas Basar GEZGIN	Istanbul Galata University, Türkiye	CULTURAL DIFFERENCES IN EMOTION EXPRESSION
Almina CORBACI Beyza MENDEŞ	Bezmialem Foundation University, Türkiye	HIV AND NUTRITION
Assoc. Prof. Alime SELÇUK TOSUN Elif Nisa KARA Assoc. Prof. Neslihan LÖK	Selcuk University, Türkiye	THE IMPORTANCE OF PHYSICAL ACTIVITY IN ELDERLY INDIVIDUALS AND INTERVENTION PROGRAMS FOR PHYSICAL ACTIVITY
Elif Nisa KARA Assoc. Prof. Alime SELÇUK TOSUN Assoc. Prof. Neslihan LÖK	Selcuk University, Türkiye	EXAMINATION OF INTERVENTION PROGRAMS TO PREVENT SUBSTANCE ADDICTION IN ADOLESCENTS

(All speakers required to be connected to the session 10 min before the session starts)
Moderator is responsible for ensuring the smooth running of the presentation, managing the group discussion and dynamics.



Zoom Meeting ID: 849 0099 9859
Zoom Passcode: 226515

01.06.2024 | HALL-4



New York Local Time: 10:00–12:30



Ankara Local Time: 17:00–19:30

HEAD OF SESSION: Assoc. Prof. Dr. Serap SARIBAŞ

Authors	Affiliation	Presentation title
Hanife ÇETİNGÜNEY Uğur BÜYÜK	Ministry of National Education, Türkiye Erciyes University, Türkiye	THE USE OF ANIMATION TOOLS IN SCIENCE EDUCATION: VIEWS OF SCIENCE TEACHERS
Yusuf KAYA Uğur BÜYÜK	Erciyes University, Türkiye	VIEWS OF SCIENCE TEACHERS ON GLOBAL CLIMATE CHANGE
Assoc. Prof. Kamil Arif KIRKIÇ Berin Esmâ İŞKİN Ayşe AK	İstanbul Sabahattin Zaim University, Türkiye	PRESERVICE ENGLISH TEACHERS' SELF-EFFICACY BELIEFS TOWARDS ENGLISH
Ahmed Mahmoud Metwally Mohammed Abdalla	Institute of Social Sciences, Türkiye	EXPLORING PHONETIC VARIATIONS IN DAILY TURKISH USE AMONG ARAB STUDENTS IN TURKEY: IMPLICATIONS FOR LANGUAGE TEACHING METHODOLOGY AND EDUCATION
Merve Suroğlu Sofu Rabia Demirkol Sibel Ekşi	İstanbul Nisantasi University, Türkiye Recep Tayyip Erdoğan University, Türkiye	A RESEARCH ON STUDENT SATISFACTION IN E-LEARNING APPLICATIONS IN TEACHING TURKISH AS A FOREIGN LANGUAGE
Esra Doğanay KOÇ	Usak University, Türkiye	DEVELOPMENT OF THE MOTIVATION SCALE IN SCIENCE EDUCATION FOR CHILDREN AGED 60-72 MONTHS: THE VALIDITY STUDY
Leyla DİLEK	Siirt University, Türkiye	REFLECTION OF THE ART OF İRSAL-İ MESEL IN THE SEMANTIC LAYER IN GAGAUZ LITERATURE
Assoc. Prof. Dr. Serap SARIBAŞ	Karamanoğlu Mehmetbey University, Türkiye	THE ANATOMY OF THE SEVEN DEADLY SINS: MEDIEVAL CLASSICS THAT INSPIRED THE FILM SE7EN; THE DIVINE COMEDY, THE CANTERBURY TALES AND PARADISE LOST

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01.06.2024 | HALL-5



New York Local Time: 10:00–12:30



Ankara Local Time: 17:00–19:30

HEAD OF SESSION: Irina-Ana DROBOT

Authors	Affiliation	Presentation title
Andia Dani	University of Tirana, Albania	THE USE OF AUTHENTIC MATERIALS AS A TOOL FOR LEARNING SPANISH FOR TOURISM AND DEVELOPING THE COMMUNICATIVE COMPETENCE OF ALBANIAN STUDENTS
Deema Dakakni Prof. Nehme Safa	University of Saint Joseph, Lebanon	ARTIFICIAL INTELLIGENCE, DIGITAL TECHNOLOGY AND THE COVID GENERATION: 'TOWARDS ACADEMIC MEDIOCRITY AND STUDENT ANXIETY?'
Lect. Dr. Gabriela Ivanovska	Ss. Cyril and Methodius University in Skopje, North Macedonia	RADICAL AND TRANSGRESSIVE EDUCATIONAL PRACTICES - CAN LITERATURE SAVE THE WORLD? -
Apana , J. A. Ntow, F. D. Churcher, K. A.	C.K. Tadam University of Technology and Applied Sciences, Ghana University of Cape Coast, Ghana	INFLUENCE OF GEOGEBRA ON SENIOR HIGH SCHOOL STUDENTS' CONCEPTUAL AND PROCEDURAL KNOWLEDGE OF AREA UNDER THE CURVE
Muhammad Ahsan Sohail Zafar Adeem Ahmad	Virtual University of Pakistan, Pakistan University of Management and Technology, Pakistan	CLASSES OF CYCLE RELATED GRAPHS WITH CONSTANT EDGE METRIC DIMENSION
Irina-Ana DROBOT	Technical University iversity of Civil Engineering Bucharest, Romania	HAIKU POEMS: THE GAME BETWEEN LITERAL AND FIGURATIVE MEANING
Rupa Sinha Sumit Haluwalia Debasish Batabyal Yashwant Rawal Sankar Kumar Mukherjee	Golden Gate University, San Fransisco, USA Christ University, India Amity University, India Parul University, India	DARK PILGRIMAGE THROUGH THE PERSPECTIVE OF THE LOCAL RESIDENTS AND SOCIAL EXCHANGE THEORY
Lykesta Murtaj	University of Tirana, Albania	APPLICATION FOR THE IMPACT OF TOURISEM MARKETING ON THE ECONOMY IN THE REGION OF SARANDA, ALBANIA

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01.06.2024 | HALL-6



New York Local Time: 10:00–12:30



Ankara Local Time: 17:00–19:30

HEAD OF SESSION: Jonida BALLA

Authors	Affiliation	Presentation title
Nesti Binishi Dhimitraq Skenderi	<i>Fan S. Noli' University, Albania Sports University of Tirana, Albania</i>	THE INFLUENCE OF AGILITY IN SPORTS GAMES OF THE 10-14 YEARS OLD AGE GROUP. (LITERATURE SUMMARY)
PhD Jonida BALLA Prof. Dr. Dhurata BOZO	<i>Sport University of Tirana, Albania</i>	USE OF BIOMARKERS IN PHYSICALLY ACTIVE INDIVIDUALS AND ATHLETES
Dhurata Bozo Irida Ikonomi Hoxha Silvi Bozo	<i>Sports University of Tirana, Albania "Aleksandër Moisiu" University, Albania Catholic University "Our Lady of Good Counsel", Albania</i>	THE IMPACT OF VITAMIN D DEFICIENCIES ON ATHLETES HEALTH AND PERFORMANCE
Ebru Elif DURMAZ	<i>Ankara University, Türkiye</i>	THE INVESTIGATION OF THE EFFECTS OF 12-WEEK EQUIPMENT-BASED PILATES EXERCISES ON SOME PHYSIOLOGICAL PARAMETERS AND EMOTIONAL STATES OF WOMEN WORKING IN DIFFERENT OCCUPATIONAL GROUPS
Ulviyya SIRACLI	<i>Azerbaijan Medical University</i>	FETAL GROWTH RESTRICTION AS A PREDICTOR OF HEALTH THROUGHOUT FUTURE LIFE
Nigar Malikova Elshad Novruzov Khayala Mammadova	<i>Azerbaijan Medical University</i>	TARGETING METABOLIC PATHWAYS FOR THERAPEUTIC INTERVENTION: A PROMISING APPROACH IN PRECISION MEDICINE
Assoc. Prof. Dr. Huseynova Gulbeniz Asif Dr. Khidirova Natavan Mahar Prof. Abiyev Huseyn Azizulla Jafarova Nasiba Asgar Hasanova Khumar Aliovsat Shahmammadova Sevinj Osman	<i>Azerbaijan Medical University</i>	TREATMENT, COMPLICATIONS AND DIAGNOSIS OF COLONOSCOPY EXAMINATION
Dr. Mammadova Ayan Etibar	<i>Azerbaijan Medical University</i>	GLUCOSE INTOLERANCE AFTER RADIOACTIVE IODINE TREATMENT IN GRAVES DISEASE PATIENTS
Nguyễn Khánh Hùng	<i>Thu Dau Mot University, Viet Nam</i>	ARTICLE 260 OF THE CRIMINAL CODE 2015 – THE PRIMARY LEGAL BASIS FOR DEALING WITH ROAD TRAFFIC ACCIDENTS IN VIETNAM, LIMITATIONS ON TECHNICAL PRESENTATION AND RECOMMENDATIONS FOR IMPROVEMENT
Olta KAPLLANI	<i>University of Tirana, Albania</i>	APPLICATION OF STRATEGIC MANAGEMENT PRACTICES BY HOTEL STRUCTURES IN THE REGION OF SARANDA, ALBANIA

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02.06.2024 | HALL-1



New York Local Time: 10:00–12:30



Ankara Local Time: 17:00–19:30

HEAD OF SESSION: Dr. Hanane RAHMOUNI

Authors	Affiliation	Presentation title
Félix IRANTIJE	<i>University Of Burundi, Burundi</i>	NAVIGATING DIVERSITY: OPINIONS ON SAME-SEX MARRIAGE IN BUJUMBURA, BURUNDI
Labinota Ramadani Dukagjin Leka	<i>Public University “Kadri Zeka”, Kosovo</i>	KOSOVO AND ITS PATH TOWARDS FULFILLING INTERNATIONAL STANDARDS ON HUMAN RIGHTS – LGBTI COMMUNITY
Divna Vuksanovic Katarina Smakic	<i>University of Belgrade, Serbia University Union-Nikola Tesla, Serbia</i>	TRENDS AND SCIENTIFIC PRACTICE: FROM AESTHETICS TO MEDIA PHILOSOPHY
Vegh Mark	<i>University of Pannonia, Veszprém, Hungary</i>	UNLEASHING INNOVATION: EXPLORING THE LANDSCAPE OF OPEN INNOVATION CONCEPTS AND TECHNIQUES
Iva Sulaj	<i>Logos University College, Albania</i>	INVESTMENT FUNDS IN ALBANIA, A FRAGILE FINANCIAL PRODUCT
Sanchita Paul Dr. H. R. Laskar	<i>Assam University Silchar, India</i>	IMPACT OF AYODHYA’S RAM MANDIR TOURISM ON LOCAL ECONOMIES AND INFRASTRUCTURE DEVELOPMENT: A CASE STUDY
Dr. Hanane RAHMOUNI	<i>University of oran 2 mohamed ben ahmed, Algeria</i>	UNDERSTANDING ORGANIZATION IN PUBLIC ADMINISTRATION
M. Tsikarishvili G. Kaladze K. Tsikarishvili	<i>Georgian Teknikal University, Georgia</i>	DEVELOPMENT OF ALGORITHM FOR PERFORMING OF CONSTRUCTION EXPERTISE
WÓJCIK- CZERNIAWSKA Agnieszka, PhD Professor GRZYMAŁA Zbigniew, PhD	<i>Warsaw School of Economics (SGH), Poland</i>	POSITIVE AND NEGATIVE INNOVATIONS ON AI ECONOMIC PERSPECTIVES IN MODERN BANKING/FINANCE

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02.06.2024 | HALL-2



New York Local Time: 10:00–12:30



Ankara Local Time: 17:00–19:30

HEAD OF SESSION: Ivan PAVLOVIC

Authors	Affiliation	Presentation title
Ivan Pavlovic Vlada Antić Milica Elezovic-Radovanovic	Scientific Institute of Veterinary Medicine of Serbia, Serbia Veterinary Ambulance Djole and Prle, Serbia Mjönäs Djurklinik, Munkfors, Sweden	LYME BORRELIOSIS OF PET DOGS IN BELGRADE AREA IN PERIOD 2019-2020
Rashi Jha Bhavita S Suthar Jaimin Menat Summayya Ansari	David Tvildiani Medical University, Georgia	BEYOND THE FACADE: RECOGNIZING STROKE CHAMELEONS FOR EARLY DIAGNOSIS AND OPTIMAL PATIENT CARE
Bogdan-Catalin SERBAN Octavian BUIU Marius BUMBAC Cristina-Mihaela NICOLESCU Vlad DIACONESCU	National Institute for Research and Development in Microtechnologies–IMT Bucharest, Romania Zentiva Romania S.A, 032266, Romania University of Targoviste, Romania Valahia University of Targoviste, Romania University of Medicine and Pharmacy 'Carol Davila', Romania	HEALTHY FOODS AND DRINKS AND THEIR HIDDEN DANGERS
Bogdan-Catalin SERBAN Octavian BUIU Marius BUMBAC Cristina-Mihaela NICOLESCU Vlad DIACONESCU	National Institute for Research and Development in Microtechnologies–IMT Bucharest, Romania Zentiva Romania S.A, 032266, Romania University of Targoviste, Romania Valahia University of Targoviste, Romania University of Medicine and Pharmacy 'Carol Davila', Romania	FROM CAFFEINE TO ETHANOL: COMMON AND UNEXPECTED CHEMICAL COMPOUNDS ON WHO'S ESSENTIAL MEDICINES LIST
Dr. Gulsah Kaya Karasu	Van Hall Larenstein University of Applied Sciences, Netherlands	THE ROLE OF THE STOMACH IN DIGESTION AND ABSORPTION IN HORSES
SOLTANI Fatiha BENABDELMOUMENE Djilali BENGHARBI Zineb BENGUENNOUNA Nouredine	Abdelhamid IbnBadis Mostaganem, Algeria	THE IMPACT OF INCORPORATING TURMERIC ESSENTIAL OIL AND POMEGRANATE PEEL POWDER ON THE NUTRITIONAL QUALITY OF BROILER CHICKEN MEAT
Azada Rustamzada Mehriban Kazimova Zumrud Abbaszada Adil Bayramov	Azerbaijan Medical University	THE ROLE OF STEM CELLS AND REGENERATIVE MEDICINE
M.F. Rustamova N.V.Malikova N.V. Bagirova X.F. Babayev Xanum Aydin gizi V.Y.Asmatov	Azerbaijan Medical University	STUDY OF THE PROOXIDANT EFFECTS THAT DEVELOP AGAINST THE BACKGROUND OF CHRONIC HALOPERIDOL ADMINISTRATION
M.F. Rustamova N.V. Bagirova X.F. Babayev N.V.Malikova F.D.Abdulkarimova V.Y. Asmatov M.M. Ganiyev	Azerbaijan Medical University	THE ROLE OF CHRONIC ADMINISTRATION OF CLOZAPINE TO EXPERIMENTAL ANIMALS IN THE DEVELOPMENT OF REPRODUCTIVE DYSFUNCTION
Nguyen Van Thien An	The University of Danang, Vietnam	ERGONOMIC FACTORS INFLUENCING THE HEALTH OF SANITATION WORKERS

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02.06.2024 | HALL-3



New York Local Time: 10:00–12:30



Ankara Local Time: 17:00–19:30

HEAD OF SESSION: Peerzada Owais ADIL

Authors	Affiliation	Presentation title
Firoza Ramazanova	Ministry of Science and Education Republic of Azerbaijan	MINERALOGICAL COMPOSITION OF GRAY-BROWN (DRY-STEPPE ZONE) AND MEADOW-GRAY SOIL (SEMI-DESERT ZONE) SOILS OF AZERBAIJAN
ATTARASSI Yassine	Ibn Tofeil University, Morocco	MAPPING URBAN TRANSFORMATIONS: ADVANCED REGIONALIZATION, EMERGING CENTRALITIES, AND DATA TECHNOLOGY PERSPECTIVES
Dritan Rustja	University of Shkoder 'Luigj Gurakuqi', Albania	ENVIRONMENTAL HAZARDS IN ALBANIA: CASE STUDY – SHKODRA REGION
Humbatov Emin	Ganja State University, Azerbaijan	AT THE BEGINNING OF THE 20TH CENTURY, THE STRUGGLE OF THE QAJAR STATE AND THE OTTOMAN EMPIRE FOR POLITICAL CONTROL OVER THE SOUTH CAUCASUS
Peerzada Owais Adil	Sharda University, India	UNVEILING THE UNTOLD: THE IMPACT OF COVID-19 ON MARGINALIZED GROUPS IN INDIAN CINEMA
Neelofar Shafi	Sharda University, India	FROM SCRIPTS TO SYMPTOMS: ANALYZING ALZHEIMER'S DISEASE IN INDIAN CINEMA
Marlene Neves STREY Juliana Soares de ÁVILA Rogério Lessa HORTA Sueli Maria CABRAL Thais Caroline Guedes LUCINI	Feevale University, Brazil	WOMEN IN THE UNIVERSITY: ADVANCES AND FRUSTATIONS
Nguyễn Khánh Hùng	Thu Dau Mot University, Viet Nam	ARTICLE 260 OF THE CRIMINAL CODE 2015 – THE PRIMARY LEGAL BASIS FOR DEALING WITH ROAD TRAFFIC ACCIDENTS IN VIETNAM, LIMITATIONS ON TECHNICAL PRESENTATION AND RECOMMENDATIONS FOR IMPROVEMENT
Giorgi Kaladze Keta Tsikarishvili Malkhaz Tsikarishvili	Georgian Technical University, Georgia	MODULAR BUILDINGS MONITORING AND STRUCTURAL RESILIENCE

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02.06.2024 | HALL-4



New York Local Time: 10:00–12:30



Ankara Local Time: 17:00–19:30

HEAD OF SESSION: Turgut Vatan TOSUN

Authors	Affiliation	Presentation title
Nihan IZ Hüseyin HALILOĞLU Ahmet FEYZIOĞLU	Marmara University, Türkiye	INVESTIGATION OF TANKS IN THE TURKISH ARMED FORCES INVENTORY USING MULTI-CRITERIA DECISION-MAKING METHODS IN THE CONTEXT OF SUITABILITY FOR MODERNIZATION
Novotorzhina Nelya Kazimzadeh Shafa Ali Adigozalov Safarova Mehpara Gahramanova Gariba Mustafayeva Yegana	Ministry of Science and Education of the Republic Azerbaijan	DIESEL FUEL ADDITIVE
Almammadova Mehriban Kamenieva Nina Bibikov Mykyta	Azerbaijan State Oil and Industry University Ukrainian State University of Railway Transport	STUDY OF ISOMORPHISM TOLERANCE CLASSES ON DIFFERENT LEVELS OF HIERARCHICAL CONTROL SYSTEMS
Turgut Vatan Tosun Kadir Gezici	Hacettepe University, Türkiye Atatürk University, Türkiye	CLOUD SEEDING PERFORMANCE ON FLOOD CONTROL AND DISASTER MANAGEMENT: CASE STUDIES ON DIFFERENT EVENTS
İsa AVCI Emre DOĞAN	Karabuk University, Türkiye	WEB APPLICATION SECURITY: DETECTION AND MITIGATION OF VULNERABILITIES
Eslem Kavas Assoc. Prof. Dr. Pınar Terzioğlu Orhan Bulut	Bursa Technical University, Türkiye Ermetal Automotive Inc., Türkiye	EFFECT OF MICRONIZED PINE WOOD POWDER AND INORGANIC FILLERS ON THE MECHANICAL PROPERTIES OF HYBRID POLYMER COMPOSITES
Şevval YILMAZ Prof. Dr. Hüseyin ÜNAL Berfin Selin DELİBAŞ Prof. Dr. Fehim FİNDİK	Metallurgy and Materials Eng. Subor Pipe Co., Türkiye Sakarya University of Applied Science, Türkiye	A RESEARCH ON MECHANICAL PROPERTIES AND HARDNESS OF POLYMER COMPOSITES WITH FLY ASH, GLASS FIBRE POWDER AND ITS HYBRID COMPOSITION
Lina Abdulkareem Sumayah Taha Abbas Uğurenver	Istanbul Aydın University, Türkiye	A COMPARATIVE STUDY BETWEEN THE INCREMENTAL CONDUCTANCE ALGORITHM AND THE FUZZY LOGIC MPPT CONTROL ALGORITHM IN A PHOTOVOLTAIC SYSTEM
Celal Kıstak Sinan Kapan Nevin Celik	Fırat University, Türkiye	PLANAR AIR JET IMPINGING ON CONCAVE AND CONVEX SURFACES

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02.06.2024 | HALL-5



New York Local Time: 10:00–12:30



Ankara Local Time: 17:00–19:30

HEAD OF SESSION: Dr. Ljiljana Simonović GRUJIĆ

Authors	Affiliation	Presentation title
Nino Beraia Lali Tokadze Ia Aptsiauri Mariam Shiukashvili	<i>Georgian Technikal University, Georgia</i>	PROSPECTS AND PROBLEMS OF USING ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION
Foti Maria Papadimitriou Sofia Karatrantou Anthi	<i>Hellenic Open University, Greece</i>	EDUCATIONAL ROBOTICS: LEARNING SCENARIOS IN DISTANCE SCHOOL EDUCATION
Jean-Marc GNONLONFOUN	<i>EREDD/LARESTI/PAY ONG, Benin Republic, West Africa</i>	EXPLORING THE INFLUENCE OF TEACHER FAVORITISM IN A BENINESE VOCATIONAL AND TECHNICAL SECONDARY SCHOOL CLASSROOMS
Musadhique Kottapparamban Elsadig Hussein Fadlallah Ali Saima Usmani	<i>King Khalid University, Saudi Arabia</i>	THE ARTICULATION OF THE SELF: A STUDY ON THE EMERGENCE, DEVELOPMENT AND THE AESTHETICS OF DALIT LITERATURE
Sepriani Dorentin Mohar Ade Epatri Nenomataus Siskawaty Noh Ibrahim Boiliu	<i>Universitas Kristen Indonesia, Indonesia</i>	USE OF THE TIKTOK APPLICATION AS A LEARNING MEDIA FOR CHRISTIAN RELIGIOUS EDUCATION USING THE STUDENT CENTER LEARNING CONCEPT
Stephen Ofori Yeboah	<i>Near East University, North Cyprus</i>	INVOLVEMENT OF PARENTS IN CURRICULUM DEVELOPMENT IN GHANA
Dr. Ljiljana Simonović Grujić Natalija Jovanovic	<i>Univesity in Kragujevac, Serbia</i>	FRUSTRATION TOLERANCE OF ADOLESCENTS AND ITS CONNECTION WITH CONSCIOUS AND UNCONSCIOUS REACTIONS
Morel Marly Ohiny MENSAH Sourou Desire Romuald Christel ZINSOUVI	<i>UAC, Flash-Adjarra, Benin</i>	AFFECTIVE FILTERS TO ENHANCE ENGLISH FOR SPECIFIC PURPOSE (ESP) LEARNERS' COMMUNICATIVE AND INTERCULTURAL SKILLS
Resiani SIMAMORA	<i>Graduate Program of Universitas Kristen, Indonesia</i>	DESIGNING THE MANAGEMENT OF CHRISTIAN RELIGIOUS EDUCATION IN THE FAMILY

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02.06.2024 | HALL-6



New York Local Time: 10:00–12:30



Ankara Local Time: 17:00–19:30

HEAD OF SESSION: Duygu DEMİR

Authors	Affiliation	Presentation title
Beste Kaya	<i>Aydın Adnan Menderes University, Türkiye</i>	VIOLENCE IN PRIME TIME: THE EFFECT OF REPRESENTATIONS OF VIOLENCE ON AUDIENCE PERCEPTION
Duygu Demir	<i>Istanbul University, Türkiye</i>	CONFLICTS BETWEEN THE OTTOMAN STATE AND RUSSIA IN THE IZMAIL FORTRESS IN THE 18TH CENTURY
Ph.D Mujkan MEMMEDZADE	<i>Azerbaijan State Academy of Physical Education and Sports, Azerbaijan</i>	NATIONAL MORAL VALUES AS AN INTEGRAL PART OF STATE POLICY
Özgun Pelin Özyol	<i>Haliç University, Türkiye</i>	INTEGRATION OF 'DESIGN FOR SUSTAINABILITY' IN DESIGN EDUCATION: PATTERNS AND TRENDS IN CURRICULAR APPROACHES
Emilya Shukurova	<i>Baku State University, Azerbaijan</i>	FACTORS FOR INCREASING THE SHARE AND EFFICIENCY OF AZERBAIJAN CANNING INDUSTRY PRODUCTS IN INTERNATIONAL MARKETS
Gülçin SAĞIR KESKİN	<i>Ankara University, Türkiye</i>	TURGUT ÖZAL ERA AND NEOLIBERAL ECONOMIC POPULISM: TRANSFORMATION OF ECONOMIC POLICIES IN TURKEY

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DIET AND NUTRITION TECHNOLOGIES IN PERSONALISED PREVENTATIVE HEALTHCARE

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ABSTRACT

The abstract explores the intersection of diet, nutrition, and technology within the realm of personalized preventative healthcare. As society faces escalating health challenges, there is a growing recognition of the importance of tailored interventions to address individual health needs. This presentation delves into the innovative technologies revolutionizing how we approach diet and nutrition within this context.

The session will highlight cutting-edge advancements such as personalized nutrition apps, wearable devices, and genetic testing, which enable individuals to make informed dietary choices tailored to their unique genetic makeup, lifestyle, and health goals. Through real-world case studies and research findings, the efficacy and potential of these technologies in promoting long-term health and disease prevention will be examined.

Moreover, the abstract will discuss the challenges and ethical considerations associated with the widespread adoption of such technologies, including data privacy concerns, accessibility issues, and the need for interdisciplinary collaboration between healthcare professionals, technologists, and policymakers.

Ultimately, this presentation aims to provide insights into the evolving landscape of diet and nutrition technologies in personalized preventative healthcare, offering attendees valuable knowledge and perspectives to navigate this rapidly advancing field.

Keywords: Diet, Nutrition, Obesity, Diabetes, Lifestyle Medicine, Preventative Healthcare

**ANXIETY AND DEPRESSION SYMPTOMS IN ADOLESCENTS AT RISK OF
EXERCISE ADDICTION**

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Abstract

Exercise addiction has been described as a negative pattern of behavior. The athlete loses control over his or her exercise habits and acts compulsively, exhibits dependence. This study aims to assess the influence of exercise addiction risk on symptomatology of anxiety and depression among adolescent athletes. For this, we examined the exercise addiction risk using the Exercise Addiction Inventory (EAI) among 7,596 adolescents (44.2% girls), aged 11-19 years (age 15.0 ± 1.8 ; BMI 20.5 ± 3.3), who engaged in regular physical activity of sports. 3,165 did not engage in competitive sports, while 4,431 competed at different levels, from local to international. The adolescents were categorized into two groups according on their EAI scores: those at high risk (HREA) and those at low risk (LREA) of exercise addiction. Anxiety and depression symptoms were assessed using the Zung Self-Rating Anxiety Scale (SAS) and the Beck Depression Inventory (BDI-II), with higher scores indicating worse symptoms. Our results showed that the prevalence of exercise addiction risk of adolescent athletes was 11.8%, more in boys than in girls (12.7% vs. 10.6%, $\chi^2 = 0.004$). Girls showed worse symptoms of anxiety and depression than boys did (both $p = 0.000$). In both sexes HREA showed greater symptoms of anxiety and depression than LREA, the differences were significant in boys (anxiety 34.5 vs. 32.9, $p = 0.000$; depression 6.7 vs. 5.6, $p = 0.002$) and girls (anxiety 38.3 vs. 35.4, depression 11.0 vs. 7.8, both $p = 0.000$). In conclusion, exercise addiction negatively influences anxiety and depression symptoms in adolescent athletes.

Keywords: Exercise addiction, adolescents, anxiety symptoms, depression symptoms.

Theme/Session/Topic: Sport Science

THE ROLE OF THE STOMACH IN DIGESTION AND ABSORPTION IN HORSES

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The stomach has essential roles in the digestive process, including the mixing, storage, and release of feed into the small intestine. The stomach utilizes hydrochloric acid (HCl) and enzymes to facilitate the processes of digestion and fermentation. The equine stomach produces two main digestive enzymes: pepsin and gastric lipase. Pepsinogen is the primary secretion of the zymogen cells located in the glands of the fundic and pyloric regions of the stomach. The digestion of proteins is facilitated by the combination of HCl. Gastric lipase, produced by the zymogen cells in the glands of the fundic region, is also present in significant amounts in horses. Gastric lipase is likely involved in the partial digestion of feed fats triacylglycerols (TAG), breaking them down into diacylglycerols and free fatty acids (FFA). The fermentation capacity of the stomach microbiota in equine nutrition is often overlooked, and there is limited knowledge regarding the diversity and structure of bacteria in the equine stomach. Bacteria in the equine stomach, including *Streptococcus bovis* and *Lactobacillus salivarius* can utilize starch or nonstructural carbohydrates from the diet. Fermentation primarily occurs in the squamous part of the stomach. The concentration of lactate-utilizing bacteria in the horse's stomach increases at 30 minutes and 210 minutes after a meal. The gastric microflora, particularly the high proportion of amylolytic bacteria, significantly influences starch digestion. Starch is degraded into lactate and volatile fatty acids (VFA) in the stomach, while in the small intestine, it is converted into glucose.

In conclusion, the stomach in horses actively participates in digestion by initiating the pre-digestion of proteins and fats, as well as physically breaking down the feed before it enters the small intestine, where the absorption of nutrients takes place.

Keywords: Horse; Stomach; Digestion

THE STUDY AND ANALYSIS OF VULNERABILITIES IN COMPUTER SYSTEMS

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ABSTRACT

The purpose of this study is to conduct extensive research about the impact of vulnerabilities on information systems. These vulnerabilities are usually known through the Common Vulnerabilities and Exposures (CVE) registry. Our objective is to provide some statistics about the distribution of CVE vulnerabilities and then find the products that have a higher probability of being affected by these vulnerabilities.

By analyzing and processing data extracted from both dataset archives and open source channels, we were able to compare the quantity and strength of security vulnerabilities and their impact on computer systems.

What we will also do is look for a correlation between the types of products being attacked and the amounts of CVEs being reported in order to get a clear idea, which will allow us to accurately direct our recommendations to the administrators of systems and manufacturers of different types of products that are more vulnerable to certain types of cyber attacks. In line with this study, we will also assess whether some manufacturers are more affected by vulnerabilities than others. This study will create a clearer idea for hardware and software manufacturers in order to focus more on raising security standards in order to meet security requirements.

This study covers a diverse range of topics, including vulnerability management, the current threats we face from cyber security attacks, and recommendations to improve cyber security.

Keywords: Common Vulnerabilities and Exposures (CVE), Cyber Security, Cyber Attack

INTRODUCTION

Nowadays, the world is full of digital devices that are in use; for this reason, cyber security has become an ongoing problem for many organizations, governments, and citizens all over the world. The development of technology and the interconnection of the world through the Internet have increased cyber attacks in unpredictable ways, which is a major challenge for the security of information systems. Many attacks occur by exploiting known vulnerabilities; these

vulnerabilities are called CVEs (Common Vulnerabilities and Exposures), which describe software or hardware vulnerabilities that are then used by attackers to achieve malicious goals. Of course, to address this threat in detail, exploring and dissecting CVEs becomes essential to facing the ongoing threat and developing a good cyber defense plan.

The current study aims to provide a broad view of CVEs based on data analysis that exposes trends and different characteristics of recorded vulnerabilities. Using data from various open-source sources, such as CVE datasets and security reports, this study highlights the impact, prevalence, and change over the year for software and hardware security vulnerabilities. Additionally, this work includes distinguishing the types of vulnerabilities and determining the target products and technologies that are least vulnerable.

It is essential to evaluate the trends of CVEs over the last few years to get an overall picture of the increasing number of vulnerabilities discovered and reported. Evaluation of CVEs depends on the extent of concern for systems and data, threat modeling, e.g., complexity of access, exploitation techniques, and potential outcomes.

In terms of highlighting sectors and technological products that are most vulnerable to CVEs, this should make it possible to allocate resources where they would be most useful and develop security procedures. Providing suggestions for proactive measures and advanced cyber security strategies that may result from the analysis performed.

By standardizing this approach, this paper is dedicated to the cyber security project by providing deep and operational insights that can be used to manage risks and build defenses in many existing organizations and systems.

MATERIALS AND METHODS

The technique is limited to the approach, data sources, and analytical methods used in the study to examine Common Vulnerabilities and Exposures (CVE). The scope of our assessments covers a complex system of analytical activities that aim to highlight distribution patterns, major trends, and special features within the data. This research tries to use different methods, which are quantitative and qualitative, in order to provide a broad picture of the panorama of cyber security vulnerabilities.

Data collection

The main source of information for this research was extracted from the CVE (Common Vulnerabilities and Exposures) dataset on the website www.kaggle.com as well as data obtained from the National Vulnerability Database, which is an official database that contains detailed information on CVE. The dataset downloaded at www.kaggle.com contains 4 datasets: CVE, products, vendor_product, and vendors. These datasets consist of different fields, where the CVE dataset consists of 89661 records and contains the following fields: mod_date, pub_date, cvss, cwe_code, cwe_name, summary, access_authentication, access_complexity, access_vector, impact_availability, impact_confidentiality, and impact_integrity. The products dataset consists of 180586 records and contains the fields cve_id and vulnerable_product. The country_product

dataset consists of 43082 records and contains the fields No, country, and product. The local dataset consists of 101659 records and contains the fields CVE_name and local. A dataset downloaded from www.cve.mitre.org, which consists of 307503 records and contains the fields name, status, description, references, phase, votes, and comments, was also taken into consideration. This study was carried out by performing an analysis on these datasets, and then the results were drawn from these data.

We performed the data acquisition process based on the official sites mentioned above and then performed the analysis and use of the data sets, working with the Python programming language using its libraries such as Pandas, Numpy, Matplotlib, Seaborn, etc.

RESULTS

In the analysis, we started with the official dataset downloaded from the official website, www.cve.mitre.org. In this dataset, we performed an analysis of the data and then made a graphic representation to have a clearer view of the data, which is presented in the following figure..

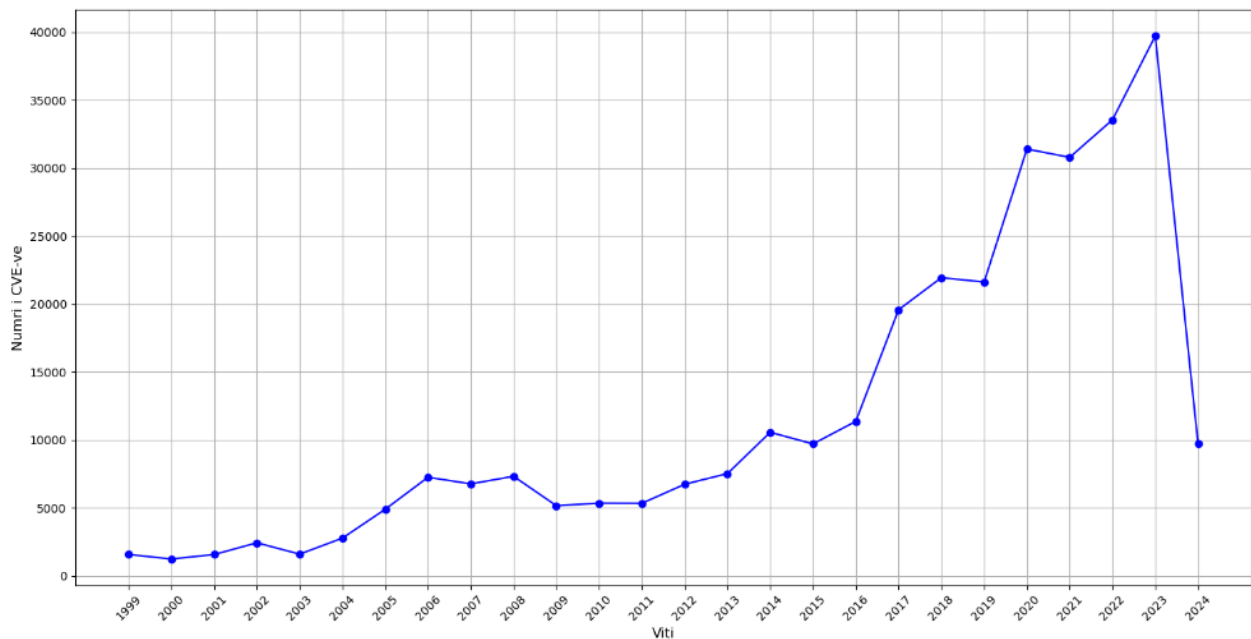


Figure 1: Number of CVEs by Year (1999 - 2024)

From the analysis performed on the Common Vulnerabilities and Exposures (CVE) dataset, we see that we have had an increasing trend in the number of CVEs identified from 1999 to 2023. Referring to the data, it is noted that in 1999, only 1,579 CVEs were recorded, while in 2023, 39,703 CVEs were recorded, also showing that there is an increase in expertise and methods for identifying cyber security vulnerabilities. This increase comes as a result of several factors, including firstly the increased use of technology, secondly the increased awareness of the importance of cyber security, and finally the improvement of methods and increased expertise in detecting and reporting vulnerabilities.

Another detail that can be noticed from Figure 1 is that we have seen a very large increase in the number of CVEs from 2016 onwards, with a record of 39,703 CVEs registered in 2023. This may

also be a result of increasing efforts to identify and document weaknesses in order to increase cyber protection in computer systems.

Study the CVE dataset on Kaggle.

A full analysis of this dataset has also been carried out. The dataset contains 89661 records and contains data for the years 1999–2019. In this dataset, we also have more detailed data, which includes fields like `mod_date`, `pub_date`, `cvss`, `cwe_code`, `cwe_name`, `summary`, `access_authentication`, `access_complexity`, `access_vector`, `impact_availability`, `impact_confidentiality`, and `impact_integrity` regarding CVE cases over the years.

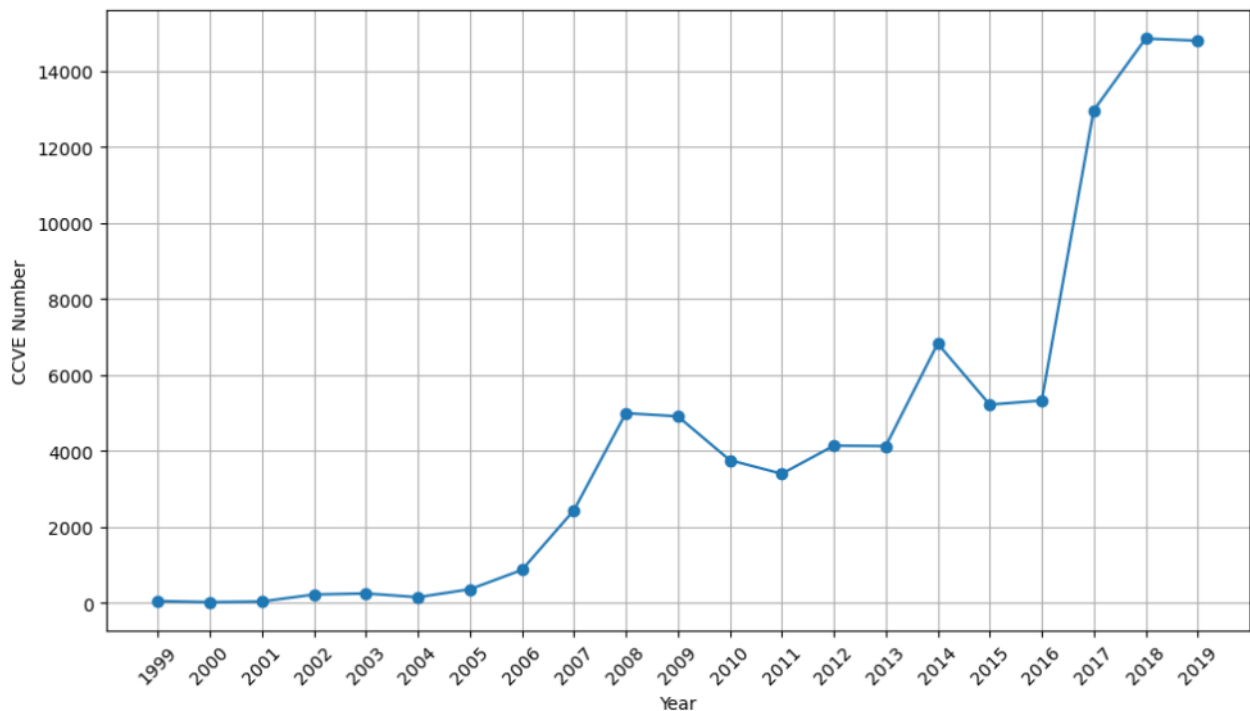


Figure 2: Number of CVEs by Year (1999 - 2020)

Referring to Figure 2, we clearly see that the trend is the same as Figure 1, which gives us confidence in the accuracy of the data, even though they are fewer in number compared to the first dataset. In order to continue the analysis further, we are also based on the distribution of vulnerabilities based on the Common Vulnerability Scoring System (CVSS), which is a method used to supply a qualitative measure of severity [1].

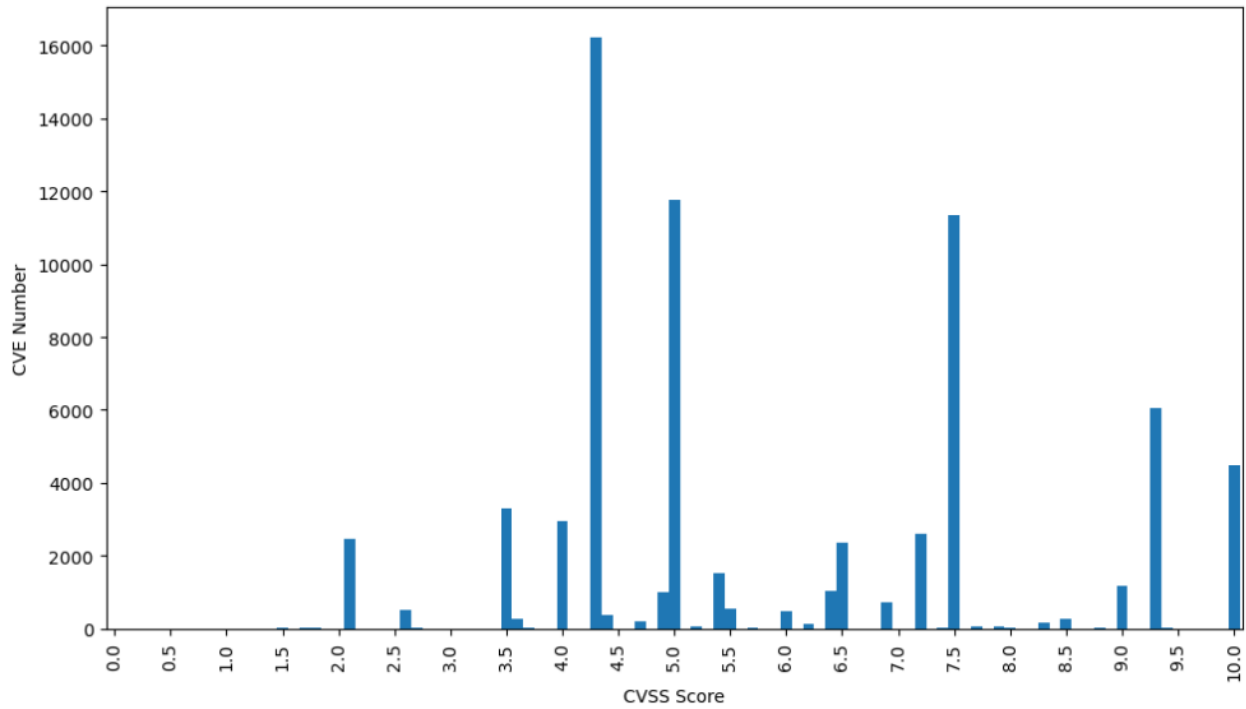


Figure 3: Distribution of CVEs by CVSS Score

From the results shown in Figure 3, we see that we have a severity distribution from 2.0 to 10.0. At medium and high CVSS scores, particularly in the 4.3, 5.0, 7.5, and 9.3 ranges, we observe a high number of CVEs. This shows the tendency of organizations and security researchers to identify and report vulnerabilities that have a greater impact on systems.

Low and High Score CVEs, There are a relatively low number of very low score CVEs and a significant number of maximum score CVEs (10.0). This tells us that vulnerabilities with minimal impact or those with a critical security level receive appropriate attention, but there is a particular focus on those with critical consequences.

Medium and High Impact: Most CVEs score in the medium to high CVSS range, indicating that vulnerabilities that have a moderate to high impact on security are more common or more commonly reported. This may be related to the importance given to the discovery of vulnerabilities that may have a greater impact on organizations.

Reporting Trends, An interesting point is why certain CVSS scores, such as 4.3, 7.5, and 9.3, have high numbers of CVEs. This may be related to the CVSS scoring methodology, security researchers' preferences for certain vulnerability reporting, or the specifics of certain risk indicators associated with those scores.

Another analysis that was taken into consideration was the analysis of the authentication type needed for accessing vulnerabilities. The following figure shows the results designed for this

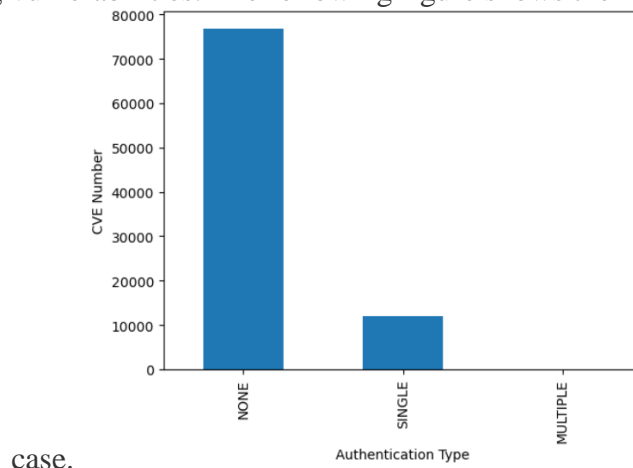


Figure 4: Distribution of Authentication Types Needed for CVEs

From the performed analysis, it turns out that we have 3 forms of authentication, which are none, single, and multiple. Figure 4 clearly shows that we have a dominance of CVEs without the need for authentication (NONE, 76777). This fact is significant since most CVEs do not require any form of authentication to be exploitable, which suggests that attackers can exploit these vulnerabilities without having to obtain or clone the victim's credentials. This happens due to poor system configurations, weaknesses in communication protocols, or a lack of sufficient authentication mechanisms in applications and services. Such vulnerabilities provide an easy entry point for attackers and increase the risk of mass exploitation of affected systems.

CVEs Requiring Single Authentication The number of CVEs requiring single authentication (11976) tells us about those cases where an attacker needs a certain level of access or credentials to exploit a vulnerability. Such cases may occur when the attacker obtains credentials through phishing, brute force, or other data compromise techniques. Although these cases require more effort to be successful, exploits that require single authentication can allow attackers to perform more advanced actions or access data.

The very low number of CVEs Requiring Multiple Authentication (23), indicates that vulnerabilities requiring high levels of authentication are much rarer. This may reflect the fact that systems with advanced multiple authentication mechanisms are more difficult to compromise, providing an additional layer of protection against cyberattacks. Multiple authentication mechanisms, such as two-factor authentication (2FA), significantly increase the challenges for attackers by requiring multiple proofs of identity before access is allowed. This partly explains why CVEs that require this type of authentication are extremely rare.

The impact of vulnerabilities on availability, integrity, and confidentiality.

We have also performed an analysis on the impact these vulnerabilities have on availability, integrity, and confidentiality. By processing the data, we see how vulnerabilities affect different aspects of a system and help us prioritize security improvements. Below is an analysis of the impact of vulnerabilities based on the data in the dataset that we have taken into consideration.

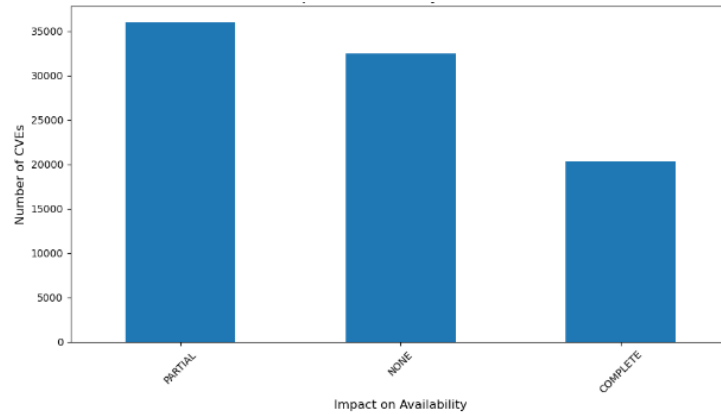


Figure 5: Impact on Availability from CVEs

Impact on Availability: Referring to the figure, we see that the impact appears in three forms:

Complete appears in 20294 cases, which is a significant number of vulnerabilities that have a complete impact on the availability of systems, which tells us that they can lead to complete disruption of services or systems. This also includes those cases when the system becomes completely unavailable to its users.

Partial, which appears in 35991 cases, indicates that in relation to these cases, most vulnerabilities have a partial impact on system availability, indicating that they can cause a partial or limited interruption of operations. This partial impact can range from low performance to limited access to some parts of the system.

None, which appears in 32491 cases; in relation to these cases, we see that a large number of vulnerabilities have no impact on system availability, which means that they do not prevent access to the system or its services.

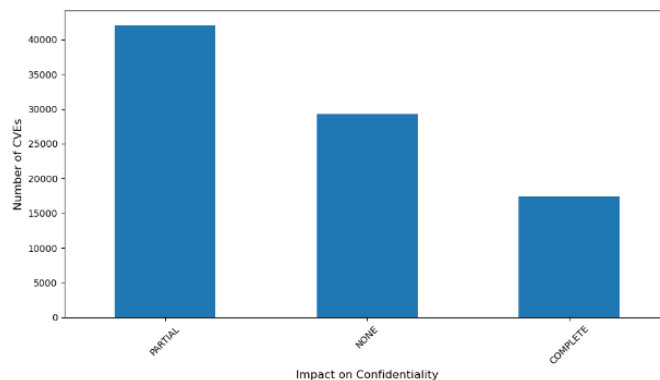


Figure 6: Impact on Confidentiality from CVEs

Impact on Confidentiality: Referring to Figure 6, we see that the impact they had on Confidentiality is as follows:

Complete Impact appears in 17418 cases. As can be seen in the figure, some of the vulnerabilities have a complete impact on confidentiality, showing that they can allow the complete disclosure of data that is part of our systems.

Partial impact appears in 42039 cases; most vulnerabilities have a partial impact on confidentiality. This may include cases where protected information becomes available to a wider audience than intended, but without full disclosure.

Cases without impact (None) are 29319. As can be seen, there are a significant number of vulnerabilities that have no impact on confidentiality, which means that they do not allow access to or disclosure of protected data.

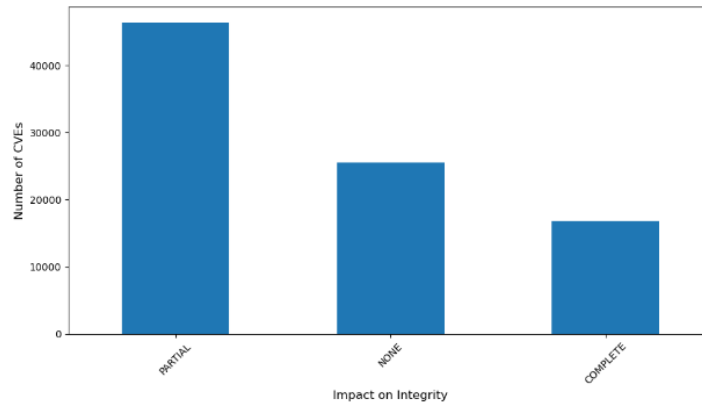


Figure 7: Impact on Integrity from CVEs

Impact on Integrity: Referring to Figure 7, we also see the type of impact that CVE vulnerabilities have on integrity. Unlike the previous two cases, in this case we noticed that the vulnerabilities with partial impacts were more numerous. See the following data to detail our analysis:

Complete impact appears in 16863 cases, where it can be seen that a significant number of vulnerabilities have a complete impact on integrity, indicating that they may allow complete modification of data or systems in an unauthorized manner.

Partial impact appears in 46357 cases, and it is noted that most of the vulnerabilities have a partial impact on integrity. This may mean that they allow limited or controlled modifications of data or system functionality, which may not be immediate or easy to detect.

Vulnerabilities without impact (None) appear in 25556, where it is noted that a large number of vulnerabilities have no impact on the integrity of data or systems, which means that they do not allow unauthorized modification of information.

In our analysis, we will also take into consideration the study of the vulnerabilities that have appeared over the years in the five most affected products. We see the results in Figure 8.

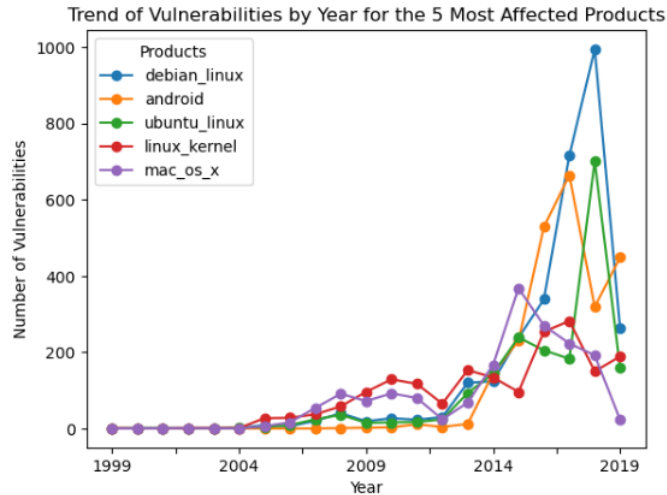


Figure 8: Trend of Vulnerabilities by year for most affected products

Referring to figure 8, we see some important trends and developments regarding the number of vulnerabilities reported for the 5 most affected products from 1999 to 2019. What is noticeable and goes along with the general trend is that we see that we have seen a significant increase over time. It is clear that most products show a significant increase in the number of vulnerabilities from year to year. Analyzing each of the products, we see that:

Debian Linux and Ubuntu Linux have a steady increase in vulnerabilities, with an apparent peak in recent years. Debian Linux in particular has a very high growth rate starting in 2017, which may indicate a greater focus on testing and vulnerability detection or perhaps an increase in the use of this operating system that attracts more related searches. with security.

Android, which is an operating system for mobile devices, has had an increasing trend of vulnerabilities since 2014. This corresponds to the increasing use of Android on mobile devices, making it a greater target for hackers and security researchers. .

The Linux kernel has constant growth; this system is the center of many Linux operating systems. The number of discovered vulnerabilities peaks in 2017, perhaps reflecting the expanded use of Linux on various servers and devices.

Mac OS X, which is Apple's operating system, had an increase in vulnerabilities through 2015, but then saw a decrease in 2019. This may indicate improvements in security robustness and/or changes in how weaknesses are identified and reported.

DISCUSSION

Based on the analyzed data, it is important to note that the analysis carried out has revealed the way in which the trend of vulnerabilities has changed from 1999 to the present day. The results of the vulnerabilities that are found and discovered the most and how these vulnerabilities are distributed according to the CVSS Score have also been extracted. Also, during the study, the results of the types of authentication found in cases of CVE detection were observed, and it was clearly seen that the highest number of CVEs was seen in cases where we had no authentication

(None). Furthermore, in the study, the analysis of the impact of vulnerabilities on availability, confidentiality, and integrity was taken into consideration. From the data, it is observed that the complete impact on availability tends to be higher than the impacts on confidentiality and integrity, showing us that attackers may prefer to cause damage that directly affects the operability of systems. Also, the analysis of the most affected products shows that some of them have had an increasing number of vulnerabilities over the years, which emphasizes the importance of continuous security updates and continuous monitoring.

CONCLUSION

From the analysis of the data on CVEs that appear during our work, it is noted that the results clearly show the impact of CVEs on availability, confidentiality, and integrity. The impact on availability, as observed, is more pronounced compared to confidentiality and integrity, a fact that shows us that attackers are interested in causing service interruptions that have a direct effect on the functioning of organizations.

Distribution of CVEs by CVSS Score: It is noted that according to CVSS Score, we have many vulnerabilities that have a high level of risk. This high concentration of CVSS high-severity CVEs means that measures for proactive risk management and strengthening of security measures must be urgently taken.

Distribution of Authentication Types Needed for CVEs The distribution of authentication types needed to exploit CVEs shows that most vulnerabilities can be exploited without authentication, which increases the seriousness and ease of attacks. This also highlights the importance of implementing strong authentication and access control policies to prevent easy exploitation of systems.

Vulnerability Trend by Year for the Most Affected Products The analysis of year-over-year vulnerability trends for the most affected products shows that some platforms and applications are consistently exposed to high numbers of CVEs each year. This points to the concentration of attack efforts and the need for continuous security improvement on these platforms.

This study shows us that measures should be taken for a complete and continuous strategy to increase security in order to face the different types of cyber risks. In particular, it is essential that organizations invest in security technology and training to prevent and minimize the impact of cyber attacks. In addition, it is important that technology manufacturers continue to work to develop and implement stronger security standards, which can improve protection against known and unknown cyber attacks. Attention should always be paid to new trends in threats, which should be a priority for all interested parties in the field of cyber security.

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**DARK PILGRIMAGE THROUGH THE PERSPECTIVE OF THE LOCAL RESIDENTS
AND SOCIAL EXCHANGE THEORY**

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Abstract

Dark pilgrimage is made up of two key ideas; pilgrimage and dark tourism. The concept of visiting locations of sorrow or calamity, also known as "dark tourism," has seen an increase in research and practice in recent years. Dark pilgrimage is the term used to describe dark tourism behaviour seen through the prism of pilgrimages, whereas dark tourism itself is the activity of visiting locations linked to violence, death, disaster, or misery. This study uses an introspective technique that takes into account the residents' own degree of travel to dark pilgrimage places to provide self-perception theory as a guiding framework for interpreting residents' sentiments. And investigates the variables influencing the local community's perception of dark pilgrimage sites by utilizing structural equation modelling (SEM) to create a conceptual model predicated on self-perception theory. Approximately 250 data points were gathered from Indian locals for the study. The study found key elements that define locals' attitudes towards dark pilgrimage sites include their beliefs, how they view themselves in relation to dark rituals, the impacts of their families and social networks, and their cultural background. The mediation analysis's findings show that the relationship between self-perception, social and familial influences, and culture is mediated by self-belief. The study's findings provide valuable insights for destination planners, and managers to understand local resident's attitude towards the dark pilgrimage sites, adding to the existing knowledge related to the factors that impact dark tourism.

Keywords: dark pilgrimage, structural equation modeling, self-perception theory, belief, social-family influences, culture

**THE ARTICULATION OF THE SELF: A STUDY ON THE EMERGENCE,
DEVELOPMENT AND THE AESTHETICS OF DALIT LITERATURE**

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Abstract

The development of Dalit literature in Indian Writing in English is the primary focus of this study. This new literary genre is shaped by the experiences and viewpoints of the Dalits. This paper explores the parameters of the debate and elaborates on the hypothesis that there is a strong Dalit literature emerging in Indian English Literature. The name "Dalit" refers mostly to the long-repressed ethnic groups in India and Nepal. We do this through an analysis of the exciting literature whose literature has been marginalized because it does not follow the literary norms and understandings. Dalits attempt to define their identity and find a voice through Dalit literature to carve out a niche for themselves in society. As Dalits reasserted them publicly, their voices became more audible and they began to vigorously develop their strategies of effective communication. It is a reflection against the existing genre which is not appropriate to express their lives and feelings. Because the early literary forms—novels, short stories, essays, picaresque novels, lyrics, sonnets, autobiographies, and secular theatres—were inadequate in portraying the oppressed, Dalits began to introduce new forms of literature. As a result, Dalit literature gives voice to the community and incorporates their lives into the language of writing.

Keywords: Dalit Literature, Dalit, Identity Formation, Marginalized Literature.

NATIONAL MORAL VALUES AS AN INTEGRAL PART OF STATE POLICY

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Abstract: History is the true teacher of the people. In the history of the Azerbaijani people, there have been hundreds of outstanding personalities who made great contributions to the development of the nation and statehood, combining political thinking and moral courage, religious outlook and secular education. The heroism, intelligence, will, and patriotism of the great sons of the Azerbaijani people, starting with Grandfather Gorgud, form the civic consciousness of the people and nurture it. In the process of revival and the awakening of the national consciousness of the people, the historical memory of the people, the inheritance of traditions are historical values that play a major role in the education of the new generation.

The history of the spiritual life of mankind proves that the striving of people to have ideals and to achieve them is a strong characteristic unique to humans as conscious beings. Ideology is one of those forms of social consciousness, within its limits are gathered the meaning, goals and values that people need morally. In this regard, the issue of the content and essence of ideology in society is extremely relevant and requires its own social understanding.

In order to determine the value strategy in the Azerbaijani society, there was a need for the formation of a national ideology, which is based on national values in the development of our country, which determines the historical development of Azerbaijan, the directions of future development, and which can unite the people around me. "The national state serves to protect not only the territory and material wealth, but also national and moral values. And at this time, the national spirit becomes a way of life. The ideology of statehood. national ideology is also formed on the same basis - on the basis of national philosophical ideas".

National leader Heydar Aliyev has repeatedly mentioned the need to preserve the unity of the people and the national identity. It is possible to respond to the challenges of the times only by taking into account the common goals, tasks and values of the people. However, you cannot be moral by law and order. Spirituality is not subject to laws, prohibitions, restrictions. It depends on the strength of the foundations of national and moral values in the society.

Keywords: state, national-moral values, propaganda

INTRODUCTION

In the early stages of the fall of the USSR, the process of renewal of values was carried out in a completely natural way, according to the principle of "denial of denial". However, since the mere denial of the values of the Soviet era could create a political and cultural danger, a serious and creative approach to this issue was needed. , returning to traditions in a spontaneous, unthought-out form could lead to the rejection of modernity, the denial of the necessity of modernization of society. The realization that the development of events can go on such a dangerous course is a deeply thought-out political, economic and cultural step aimed at raising the positive, creative character of spiritual revival. - there was a need to develop and prepare a complementary ideology. This ideology should be based, first of all, on the importance of a

differential approach in the approach to the revived heritage, on the traditions that the people have preserved and kept alive for centuries, on the universal values that serve the democratization, renewal, and modernization of our society [4, p.34] .

History is the true teacher of the people. In the history of the Azerbaijani people, there have been hundreds of outstanding personalities who made great contributions to the development of the nation and statehood, combining political thinking and moral courage, religious outlook and secular education. The heroism, intelligence, will, and patriotism of the great sons of the Azerbaijani people, starting with Grandfather Gorgud, form the civic consciousness of the people and nurture it. In the process of revival and the awakening of the national consciousness of the people, the historical memory of the people, the inheritance of traditions are historical values that play a major role in the education of the new generation.

METHOD

The awakening of the national spirit of the Azerbaijani people, the formation of the moral ideals of the nation was an event that reflected the deep connection and unity of the nation with the whole of humanity. All nationalities living on the territory of Azerbaijan have a single mentality and general philosophy of behavior without losing their uniqueness. This single moral basis has become the source of interethnic friendship and agreement during our period of independence. At the same time, this ideology is based on the mind and will, which can cause inter-ethnic conflicts in the extreme conditions of that period, and can prevent emotional challenges [6, p.54].

Today, the struggle for the determination of our national identity should be based not only on the form, but also on the content, in the direction of the return of traditions, national and spiritual values to the roots, based on scientific and theoretical foundations. Especially at a time when television, media and national spirituality are full of alien elements, the protection of the spiritual environment should be considered as an important issue. One of the most acute problems of the modern era is finding the optimal balance between the process of globalization and national traditions. The process of globalization is aimed at the spread of science, technology and universal values along with cultural and spiritual factors that determine national identity. It doesn't matter if it's intentional or not. In such a situation, intellectuals should first know what they should defend, and in which cases they should purposefully determine the need to be traditionalist and conservative.

The Heydar Aliyev Foundation, which has won the public's sympathy with its large-scale activities in the direction of preserving and promoting our national and moral values, also achieves great achievements in this field. The president of the foundation, Mehriban Aliyeva, always pays attention to the protection and restoration of historical, religious and cultural monuments. Recently, we witnessed this again. The Shamakhi Juma Mosque, one of the holiest temples in the Muslim world, was put into use after large-scale restoration and reconstruction works as a result of the efforts of President Ilham Aliyev and the Heydar Aliyev Foundation. It should also be noted that the Heydar Aliyev Foundation has special services in promoting the traditions of tolerance, in understanding our heritage, as well as in visual presentation in different parts of the world. With the financial support of the Foundation, repair and restoration works were carried out in Orthodox churches and St. Mary's churches in Baku, and the construction of an educational and cultural center for Jewish children was also supported. The financial assistance to repair the windows in Strasbourg is a generous gesture and a worthy contribution of Azerbaijan to Europe and its cultural heritage. As it can be seen, the Heydar Aliyev Foundation takes care not only of the restoration of historical and religious monuments related to Islam, but also of the restoration of monuments belonging to other religions outside

the borders of Azerbaijan, which is a clear proof of tolerance and peace-loving of our people [3, p.40].

The people of Azerbaijan have been able to preserve their existence, national identity and uniqueness by their loyalty to national and moral values. One of the greatest assets of the Azerbaijani people is its rich national culture, material, literary and state heritage. This rich spiritual heritage has been created by our people for centuries and a large part of it has been preserved to this day. Our mughams are one such rich heritage. Mugham is the pearl of our people, the genetic code of our people. Mugham passed from generation to generation and remained in the blood of the Azerbaijani people and left an eternal mark in the hearts of our people.

As a result of our state's great concern for mugham, this art not only conquers new heights day by day, but also helps to create new projects - magazine about mugham, mugham anthology, mugham encyclopedia. Very interesting concerts, festive events and high-class evenings dedicated to mugham have been held in this magnificent building.

The study of national traditions and their transformation into a system of moral values has always been relevant. Because in all historical periods, the traditions and customs that reflect the level of social consciousness of the country were also an indicator of cultural progress and moral qualities. On the other hand, the examples of artistic creativity of each nation have become classical and cultural heritage in the space of traditions. Old traditions and customs were used in accordance with newly created moral values and principles of consistency. But this did not prevent the development and renewal of moral values. It is in the form of tradition that new directions of spiritual culture based on historical experience have emerged.

National and spiritual values are the sacred, inviolable heritage of the nation, its progress elevates the existence and eternity of the national being. Each nation has its own history, mentality and millennial values created by its ancestors. Our national culture inherited from the ancient history of Azerbaijan should be protected, enriched and passed on to future generations by the new generation. Thus, culture cannot preserve its existence without changing, improving and enriching it. The young generation should be brought up in a healthy mood based on the moral values of mutual trust in the world [2, p.110].

Our ancient traditions should be at the center of attention in the organization of work in all fields of culture, as well as in cultural centers, palaces, museums, and libraries. The problem of moral education of our compatriots, formation of personality and free time is closely related to the main activity of cultural institutions.

The study and recovery of our national traditions, forgotten examples of folklore, the expression of events that make people think, create a feeling of joy and sadness in them, mass celebration of unforgettable and significant events in the form of events - this is the city and district culture houses, palaces, clubs, museums, libraries, recreation and are the qualities of cultural level, leisure and entertainment, artistic and mass work, which constitute the essence of the activity of cultural parks, Olympic centers.

There is no city, district, village or village in our republic where mass events of various styles are organized. In addition to being the main field of activity of mass artistic creation cultural institutions, it is divided into two parts, which include promotion of intangible cultural samples and art: using illustrations, in connection with the holding of concerts, magazines, cinema and other mass events in concert halls (indoor space); The second is the complex business style that surrounds these holidays, picnics, and other mass events organized in squares, parks, and alleys. Theater art, which is the main direction of mass work, is widely used in such events. National, historical and traditional holidays and ceremonies of our people occupy a special place in mass events. These holidays reflect our ancient culture, national traditions, artistic resources and historical events created by our people over the centuries. Holidays and

ceremonies also affect people's feelings and emotions, enrich their spiritual qualities, formality, cultural life of the society, and serve for the meaningful and efficient passage of rest and leisure time. The French philosopher K. J. Rousseau, who appreciated the moral value of holidays, said: "if you want to make people hardworking and creative, let them celebrate" [5, p.110].

According to Aristotle, human nature wants not only to work, but also to learn and record. He has every right to it. It seems that holidays and ceremonies are one of the main factors that make human life meaningful. Here they see, communicate, share their joys and sorrows.

Along with Novruz, Ramadan, Eid al-Adha, Republic Day, Freedom Day, Constitution Day, etc., and such historical days, as our integration into other cultures expands at every stage of society's development, new international holidays and historical days have entered our lives. Although the roots of some of them go back to ancient times, they have recently started to celebrate modern holidays in our country. As in every historical stage, holidays, historical events and days are celebrated with great solemnity in modern times.

The main function of library exhibitions in our country is to acquaint readers with the national values, history and culture of their country, as well as to provide an opportunity to present the heritage of traditions to different categories of readers through thematic exhibitions. Libraries can hold a series of talks and exhibitions to keep the glorious pages of Azerbaijan's history alive, to introduce our history to today's and future generations, to demonstrate the history of our people, nation, and national moral values.

In very ancient times, various national games of Eastern peoples, including Turks, were played on horses. They are known in Azerbaijan, as well as in Central Asia, as chovkan games, and have a special place among the games spread in nearby cities under different names. Thousands of years ago, the charming land of Azerbaijan in Karabakh, and then the sound of bravery jumping on Karabakh horses from all over the world, was a symbol of courage and agility. In our national equestrian games like Chevkan, people would look at their loved ones who participated in the competition with love, their husbands and sons would show their skills and earn a name in the village. Herodotus, who is considered the "father of history", wrote in the 5th century AD that there were horses in the ancient Azerbaijan state of the Middle Ages. Four centuries later, another famous Greek historian, Strabo, wrote about Caucasian Albania, where horses were very good. These facts show that the land of Azerbaijan has been a country where horse breeding has developed in the East since ancient times. Karabakh, Gazakh, Guba and Shirvan horses were widespread among horse breeds that have existed in our country for centuries. According to historical sources, Alexander the Great, as a gift to the ruler of Iran, increased his cavalry forces at the expense of Karabakh horses. The famous scientist P. Usupov said about the history of the Karabakh horse: "No matter what role the British horse played in European horse sports, the Karabakh horse was equally important in the development of Asian horse sports" [1, p.80]. At the end of the 19th century, the horse expert D. Dubensky wrote that although there are a number of horse breeds in the South Caucasus, they are actually all descendants of the Karabakh horse. In the middle of the last century, the sound of horses in Karabakh came from Europe.

Historical facts also confirmed that the game "chovgan" was very popular in Azerbaijan, mainly in Karabakh. Traces of this can be found in Azerbaijani literature and art. Traces of this can also be found in "Kitabi-Dada Gorgud" and "Khosrov and Shirin" by Nizami Ganjavi. Literary examples show that not only men, but also women took part in the Azerbaijani game of "chovgan". In Nizami's poem "Khosrov and Shirin", Shirin is not inferior to the Sassanid ruler Khosrov Parviz. In addition to cute, this game also depicts the participation of girls. We proved this by reviving our national and moral values during national games in the 21st century, which is a rich page of our cultural heritage.

RECOMMENDATIONS

Even great commanders and rulers retreated in front of peoples with high moral values, beliefs and faith. A fair and orderly society has been the dream of both people and philosophers. Tusi writes: "If a community wins and comes to power, creates order and treats the population well, if it is fair, if it gains trust, their state can live for a while, otherwise it will quickly fall apart." "Govern the subjects based on the laws of justice, virtue and wisdom because the main duty of the state is to engage in good deeds and prevent evil deeds.

The history of the spiritual life of mankind proves that the striving of people to have ideals and to achieve them is a strong characteristic unique to humans as conscious beings. Ideology is one of those forms of social consciousness, within its limits are gathered the meaning, goals and values that people need morally. In this regard, the issue of the content and essence of ideology in society is extremely relevant and requires its own social understanding [7, p.43].

In order to determine the value strategy in the Azerbaijani society, there was a need for the formation of a national ideology, which is based on national values in the development of our country, which determines the historical development of Azerbaijan, the directions of future development, and which can unite the people around me. "The national state serves to protect not only the territory and material wealth, but also national and moral values. And at this time, the national spirit becomes a way of life. The ideology of statehood. national ideology is also formed on the same basis - on the basis of national philosophical ideas".

National leader Heydar Aliyev has repeatedly mentioned the need to preserve the unity of the people and the national identity. It is possible to respond to the challenges of the times only by taking into account the common goals, tasks and values of the people. However, you cannot be moral by law and order. Spirituality is not subject to laws, prohibitions, restrictions. It depends on the strength of the foundations of national and moral values in the society.

Currently, the state's attention to the preservation and strengthening of national and moral values, which are the basis of the country's development strategy, indicates the urgency of the problem.

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**HOMEOPATHIC MEDICINE IS A MEDICAL PRACTICE THAT INVOLVES A
HOLISTIC, NATURAL APPROACH TO TREATING PATIENTS**

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ABSTRACT

Developed in Germany in the late 1700s, homeopathy is a medical system based on the principle that "like cures like" (the law of similars). A substance that, when given in large doses, causes a certain set of symptoms is believed to cure the same symptoms when it is given in minute to nonexistent doses. The minute dose is thought to stimulate the body's healing mechanisms. Treatments are based on the patient's unique characteristics, including lifestyle, as well as symptoms and general health. Homeopathy aims to restore the flow of the body's energy; it is not based on principles of chemistry or physiology.

Keywords: Homeopathic medicine, Patient, Treatment, Medical practice

Developed in Germany in the late 1700s, homeopathy is a medical system based on the principle that "like cures like" (the law of similars). A substance that, when given in large doses, causes a certain set of symptoms is believed to cure the same symptoms when it is given in minute to nonexistent doses. The minute dose is thought to stimulate the body's healing mechanisms. Treatments are based on the patient's unique characteristics, including lifestyle, as well as symptoms and general health. Homeopathy aims to restore the flow of the body's energy; it is not based on principles of chemistry or physiology (Stub T, Kristoffersen AE, Overvåg G, et al.,2020).

Remedies used in homeopathy are derived from naturally occurring substances, such as plant extracts and minerals. Extremely low concentrations are prepared in a specific way. The more dilute the homeopathic remedy, the stronger it is considered to be. Many solutions are so dilute that they contain no measurable molecules of the active ingredient. For example, 30C dilution is diluted 1 to 100 in 30 serial dilutions, resulting in a final dilution of 1×10^{60} (Boehm K, Raak C, Cramer H, et al.,2014) .

Homeopathic products are available over the counter or from a homeopathic provider. Homeopathy, or Homeopathic Medicine, is the practice of medicine that embraces a holistic, natural approach to the treatment of the sick. Homeopathy is holistic because it treats the person as a whole, rather than focusing on a diseased part or a labeled sickness. Homeopathy is natural because its remedies are produced according to the U.S. FDA-recognized Homeopathic Pharmacopoeia of the United States from natural sources, whether vegetable, mineral, or animal in nature (Pieruccini, A.,2020).

The word Homeopathy, which comes from the Greek, through Latin into English, literally means like disease . This means that the medicine given is like the disease that the person is expressing, in his totality, not like a specific disease category or medical diagnosis (Relton, C.; Cooper, K.; Viksveen, P.; Fibert, P.,2017).

The first principle- let likes cure likes:The guiding principle of Homeopathy is stated as let likes cure likes, similia similibus curentur. While the concept of “like curing like” dates back to the Greek Father of Medicine, Hippocrates (460-377 B.C.), it was German physician Dr. C. F. Samuel Hahnemann (1755-1843) who first codified this principle into a system of medicine. Starting with experiments (called provings) on himself, Dr. Hahnemann administered medicinal substances to healthy volunteers (called provers). Symptoms that developed in the provers while taking a specific substance gave the homeopathic picture of, and indications for, that remedy. Over the years, by means of provings, toxicological data, and clinical experience, the homeopathic drug pictures of over 2000 substances have been derived. In the practice of Homeopathic Medicine, a detailed, comprehensive interview of the patient, called the homeopathic case-taking, is undertaken to reveal the physical, psychological and emotional characteristics and complaints of that individual. The homeopathic practitioner then finds the homeopathic remedy whose materia medica (drug picture) is the most similar to that of the patient’s characteristic totality. That homeopathic prescription (the similimum) is given to the patient to stimulate his/her being to heal: likes cures likes (Stub T, Kristoffersen AE, Overvåg G, et al.,2020).

The second principle- the minimum dose:The second principle of Homeopathy is that of the minimum dose. Dr. Hahnemann began using medicinal substances known to work in his day, such as Cinchona or Peruvian bark, for relapsing fever, in a homeopathic way. That means that he administered a medicament with a known remedy picture to a sick person who had a similar symptom picture. But, in the beginning, he was using crude substances, for example, full strength herbs. He observed that, while the patients got well, they also had side effects. To minimize those side effects, through further experimentation, he came upon the idea of potentization. Homeopathic medicines are prepared through a series of dilutions, at each step of which there is a vigorous agitation of the solution called succussion, until there is no detectible chemical substance left. As paradoxical as it may seem, the higher the dilution, when prepared in this dynamized way, the more potent the homeopathic remedy. Thereby is achieved the minimum dose which, none the less, has the maximum therapeutic effect with the fewest side effects. In fact, Homeopathy has an enviable centuries old history of safety in use of its potentized oral medicines among patients of all ages, including babies, children, pregnant and nursing women, and senior citizens (Boehm K, Raak C, Cramer H, et al.,2014) .

The third principle- the single remedy:The third principle of Homeopathy is the single remedy. Most homeopathic practitioners prescribe one remedy at a time. The homeopathic remedy has been proved by itself, producing its own unique drug picture. That remedy is matched (prescribed) to the sick person having a similar picture. The results are observed, uncluttered by the confusion of effects that might be produced if more than one medicine were given at the same time (Pieruccini, A.,2020).

About homeopathic treatment- acute and chronic: There are two main categories of treatment in Homeopathic Medicine; i.e., acute and chronic. Acute treatment is for illness of recent onset; it may be self-limited (for example, the common cold), or it may progress if not treated (for example, pneumonia). In such an illness the body might overcome the illness, a cold for example, sooner or later, but the appropriate medicine gently stimulates the body to recover more quickly and efficiently. Chronic or constitutional treatment is the other main category of treatment. A chronic disease is long standing or a recurrent health problem. The length of treatment and the challenge to achieve positive results is affected by many factors, including the nature of the problem, the early health history, the family medical history, the previous treatment, and the person's inherent constitutional strength. The goal is to help the person to return to a state of well-being through individualized homeopathic treatment (Stub T, Kristoffersen AE, Overvåg G, et al.,2020).

Federal recognition of homeopathic medicine: Officially recognized under the 1938 Food, Drug, and Cosmetic Act, the 1965 Medicare Act, and the 1987 FDA Compliance Policy Guidelines, these safe, gentle but deep-acting medicines can be used to treat persons experiencing many kinds of medical conditions. It would be wise, nonetheless, to discuss with the prospective homeopathic practitioner his/her experience with one's particular complaint or problem. Today, millions of people in the U.S. turn to homeopathic products to treat everything from the common cold to muscle aches. In the U.S., homeopathic medicines are regulated by the FDA as drugs. But they're quite a bit different from your typical blood pressure medication or allergy pill. They contain highly diluted substances that are thought to cause the body to heal itself. And some products don't contain measurable amounts of these substances at all. You might think there's no harm in giving homeopathic products a try. But it's important to understand the potential risks and what the research says before you do (Zhang, Y.; Zehnder, J.,2020).

Homeopathy is an approach to alternative medicine that has been around for over 200 years. The word "homeopathy" comes from a combination of "homeo" (similar) and "pathos" (suffering). This refers to the principle of "like cures like." In other words, a substance that causes certain symptoms can be used in small amounts to treat those same symptoms. This type of treatment is believed to activate the body's own healing process. Homeopathic medicines are typically chosen based on your specific symptoms. Homeopathic medicines contain highly diluted substances that come from a variety of sources, including animals, plants, and minerals. There are also homeopathic vaccines called "nosodes." Nosodes contain highly diluted elements of a disease (like diseased tissue). Many homeopathic medicines are available over-the-counter (OTC). They're also called "remedies." You can find them most commonly as tablets, pellets, liquids, and topical (Stub T, Kristoffersen AE, Overvåg G, et al.,2022).

The Homeopathic Pharmacopoeia of the United States (HPUS) Revision Service is the official guide of homeopathy. It contains information and manufacturing standards for over 1,300 official homeopathic substances. If a homeopathic medicine has the letters "HPUS" on its label, then it includes an official homeopathic ingredient. This "HPUS" designation is usually found next to the active ingredient(s) in the label's "Drug Facts" section. Homeopathic medicines are used to treat a wide variety of acute ailments (Gargiulo, L.,2020).

Examples include: Cough, Sleeping problems, Muscle pain, Allergies, Ear pain, Acne, Diarrhea. Some healthcare providers who specialize in homeopathy may recommend homeopathic medicines for chronic medical conditions. Do not attempt to do this on your own without medical guidance from your provider. The FDA hasn't evaluated the safety and effectiveness of homeopathic products. And the experts say there's little evidence to support using them to treat a particular medical condition. How they're brought to market is also different from traditional medications (Pieruccini, A.,2020).

When traditional medications are being researched for a particular use, they're tested in people with the condition. Safety and effectiveness are validated before they can be marketed. Homeopathic medicines are established through "provings." This is when a substance is shown to cause symptoms in a healthy person. The substance is then used to treat those symptoms in a sick person. Based on how they're made, you might assume there's little risk to giving homeopathic products a try. However, some products contain a greater amount of active substances than what's on the label. For example, the FDA found higher levels of a toxic substance called belladonna in homeopathic teething tablets in 2017. Homeopathic products shouldn't replace your FDA-approved medications, especially for serious medical conditions. But if you're looking to add a homeopathic medicine to your regimen, talk to your healthcare provider first (Stub T, Kristoffersen AE, Overvåg G, et al., 2022).

Homeopathy and psychological therapies: Psychological therapies can be defined as a wide range of nonpharmacological counselling-based interventions, inspired by the principles of clinical psychology, which are aimed to help people in coping with distress and in improving their psychosocial functioning through the promotion of positive changes in their thinking, behaviors, and relationships. According to the American Psychological Association, all psychological therapies belong to a category of the following: Psychoanalysis and psychodynamic therapies, based on the study of the unconscious to modify problematic behaviours, feelings, and thoughts. Behavior therapy, focused on learning how to develop normal and correct abnormal behaviors (Relton, C.; Cooper, K.; Viksveen, P.; Fibert, P., 2017).

Cognitive therapy, focused on the patient's thoughts and on any dysfunctional way of thinking. Humanistic therapy, emphasizing the role of rationality to unlock the patient's potential and improve their functioning. Integrative or holistic therapy, a different combination of two or more of the above mentioned approaches depending on the practitioner's skills and on the patient's health needs (Gargiulo, L. 2020).

Homeopathy has long been used for problems of a psychological nature and, recently, some theories have underscored that there are similarities between homeopathic care and some psychological therapies, including psychoanalysis. Moreover, according to the so-called "Dodo Bird Verdict", a theory of many in the field of epistemology, different psychological and psychological-like therapies may share a broadly similar degree of clinical efficacy, regardless of their specific approach, and this might apply to homeopathy as well when reinterpreted as a psychotherapy. In particular, individualized homeopathy has been portrayed by some authors as a humanistic-like therapy, with influences from narrative medicine, due to its person-centered approach and detailed patient's interviews, and some synergies have been outlined between homeopathy and psychoanalysis, especially with regard to the characteristics of the patient-practitioner relationship. Despite this, in contrast with common psychological therapies, homeopathy still retains its distinctive features as a remedy-based practice in which the subject's interview aims to understand the underlying disease roots along with specific characteristics of the patient's biotype/constitution (classified as "carbonic", "phosphoric", "fluoric", and "sulphuric" on the basis of some psycho-physical features) in order to select the best remedy among the many. However, homeopathic consultations are characterized by a deep analysis of the patient's inner world of experiences and associations in such a way as to create an evocative premise for eliciting placebo effects (and the physiological response triggered by them). This can result in the creation and introduction into the patient's mind of psychologically healing inputs, possibly at an unconscious level. Historically, homeopathy is rich in symbols: Homeopathic remedies, with their Latin names, remind of very many different substances, objects, or living beings (for example, plants like *Aconitum napellus* or *Cactus grandiflorus*; minerals like *Magisterium bismuthi* or *Sulfur iodatum*; animals like *Vipera aspis* or *Blatta orientalis*), and they are all believed to possess a variable range of therapeutic "power" depending on their degree of dilution. We can possibly hypothesize that beneficial

effects of homeopathy are, at least partially, due to the introduction of symbols into the patient's psychism, and their efficacy may be the same regardless of the subject's cultural awareness of them. In fact, "homeopathic symbols" may recall Jungian archetypes, that derive from the collective unconscious and are shared by all human beings in spite of their specific background, or they may simply offer a new identity/shape to symbols and forces already present in the patient's mind, but unable to emerge (Mathie RT, Fok YYY, Viksveen P, et al.,2019).

It is known that hypnosis-based therapeutic approaches aim to obtain beneficial effects by conveying specific "data" to the patient's mind with the help of hypnotic trance, in order to trigger a healing response and to fix "crystallized" behaviors and beliefs which may form the deepest roots of some psychological problems. If we consider homeopathic care as a placebo treatment capable of stimulating some physiological effects, it is possible to understand how this potential can become the anchor to make each transferred symbol (represented by homeopathic remedies) work inside the patient's unconscious and trigger a beneficial transformation. The therapeutic ritual of repetitions in remedy administration over days and weeks during the course of the treatment can elicit placebo effects and can enhance the above-mentioned process. If properly used, each symbol has an intrinsic transforming potential and can modify a static situation, thus acting as a neutralizing factor between two opposite and conflicting forces or tensions. Therefore, it is possible to imagine why many people report subjective beneficial effects from homeopathy, even if these benefits are hard to measure from a clinical/organic point of view. In fact, it can be hypothesized that homeopathy can act at an unconscious level by modifying the disease experience, characterized by an extreme inter-individual variability in its constitutive elements (Mathie RT, Fok YYY, Viksveen P, et al.,2019).

As an example, it is possible to describe the hypothetical but realistic case of a patient with anxiety who experiences recurrent nightmares and for whom it is proposed a treatment for some weeks with *Aconitum napellus*, a homeopathic remedy obtained from a highly diluted extract of the homonym poisonous plant. Along with a placebo treatment capable of reducing anxiety symptoms, the patient may benefit from receiving a symbol or, in other words, a neutralizing factor, which can help to overcome their overwhelming feeling of powerlessness and "psychological paralysis", thus contributing to find again the lost inner serenity (as it was prior to experiencing this condition) and a good sleep (Zhang, Y.; Zehnder, J.,2020).

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**PATHOPHYSIOLOGY OF THE ROLE OF EXTERNAL FACTORS IN THE
DEVELOPMENT OF PULMONARY EMPHYSEMA**

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ABSTRACT

Laennec first described pulmonary emphysema from observations of the cut surface of necroscopic human lungs that had been air dried in inflation. He attributed the lesions to atrophy of lung tissue resulting from overinflation, and this hypothesis appeared in a major textbook of pathology as late as 1940. Emphysema was redefined as abnormal permanent enlargement of airspaces distal to terminal bronchioles, and this definition was modified to include destruction of alveolar walls without obvious fibrosis. McLean and Leopold and Gough implicated the inflammatory response in the pathogenesis of the centrilobular form of emphysema, but this suggestion was interpreted conservatively because their studies were based on necroscopic specimens that were frequently contaminated by terminal bronchopneumonia.

Keywords: Pulmonary emphysema, External factors, Pathophysiology, Diagnosis

Laennec first described pulmonary emphysema from observations of the cut surface of necroscopic human lungs that had been air dried in inflation. He attributed the lesions to atrophy of lung tissue resulting from overinflation, and this hypothesis appeared in a major textbook of pathology as late as 1940. Emphysema was redefined as abnormal permanent enlargement of airspaces distal to terminal bronchioles, and this definition was modified to include destruction of alveolar walls without obvious fibrosis. McLean and Leopold and Gough implicated the inflammatory response in the pathogenesis of the centrilobular form of emphysema, but this suggestion was interpreted conservatively because their studies were based on necroscopic specimens that were frequently contaminated by terminal bronchopneumonia (Mortensen J, Berg RM., 2019).

Pathology: The seminal work of McLean and Leopold and Gough established that centrilobular emphysema (CLE) is the result of dilatation and destruction of the respiratory bronchioles (fig 1). Subsequent studies showed that these lesions are larger and more numerous in the upper lung. The term focal emphysema was introduced to describe a form of lung destruction that has a similar origin but is more widely distributed and less severe than centrilobular emphysema. Panlobular or panacinar emphysema (PLE) results from a more uniform destruction of all of the acini within the secondary lobule. Thurlbeck showed that, in its mildest forms, it is difficult to discern PLE from normal lung unless the lung is fixed in full inflation and carefully examined using low power magnification. In contrast to the centrilobular lesion, panacinar emphysema is more severe in the lower lobes but a predominant lower lobe distribution only becomes statistically significant in severe disease. Panacinar emphysema is commonly associated with α_1 -antitrypsin deficiency, but is also found in cases where no clearcut genetic abnormality has been identified (Mortensen J, Berg RM.,2019).

Distal acinar, mantle, and paraseptal emphysema are terms used to describe lesions that occur in the periphery of the lobule along the lobular septae, particularly in the subpleural region. Localised paraseptal emphysema has been associated with spontaneous pneumothorax in young adults and bullous lung disease in older individuals where individual large cysts may interfere with lung function. Unilateral emphysema or McLeod's syndrome occurs as a complication of severe childhood infections caused by rubella or adenovirus, and congenital lobar emphysema is a developmental abnormality affecting newborn children. The emphysema that forms around scars lacks any special distribution in the lobule and is referred to as irregular emphysema (Azer SA, Awosika AO, Akhondi H.,2023).

Leukocyte kinetics in the lung: Leukocyte accumulation in the lung is a feature of emphysema (see below). The traffic of leukocytes through the lung microvessels and their migration out of the vascular space through the tissue and into the airspaces is incompletely understood. The pulmonary circulation receives the entire output of the right ventricle—that is, ~6 l/min or 8600 l blood in 24 hours. As each litre of blood contains 10^9 leukocytes, the lung receives approximately 8.6×10^{12} leukocytes every 24 hours. The bronchial circulation adds approximately 1% of the left ventricle output to this value and this increases in disease. The neutrophils are the easiest to keep track of because they do not divide after they enter the circulation from the bone marrow, normally remain inside the vascular space, and do not re-enter the circulation after they migrate out of the microvasculature. The maximum diameter of the circulating cells is slightly larger than the average capillary but, because the disc shaped erythrocytes are able to fold, they are much more deformable than the spherically shaped leukocytes. This allows erythrocytes to move through restrictions in lung capillaries much more quickly than leukocytes, and the multisegmented nature of the lung capillary bed allows the faster moving erythrocytes to pass the slower moving neutrophils. This difference between erythrocyte and leukocyte transit time concentrates the neutrophils with respect to the erythrocytes in the lung capillaries and accounts for the so-called marginated pool of neutrophils in the pulmonary circulation. Cigarette smoking increases the number of marginated neutrophils in the lung capillary bed. Only a very small proportion of circulating neutrophils delivered to the lung ever migrates out of the vascular space, even in the presence of strong stimuli such as pneumococcal pneumonia (Kerimova R.C., Veliyeva Z.Y.,2022). Walker and colleagues have shown that the surface of interstitial fibroblasts form a network that guides the neutrophil from its point of exit out of the capillary to the point of entry into the alveolar airspace. Their work suggests an important interaction between the leukocytes and the surface of the interstitial fibroblast as the neutrophils move through the alveolar wall interstitial matrix. Whether proteolysis of the matrix is necessary for neutrophil emigration remains unsettled. Gelatinase B

(MMP-9), for example, has been implicated in some studies, but neutrophils appear to enter tissues normally in gelatinase B-deficient mice (Azer SA, Awosika AO, Akhondi H.,2023).

Monocyte/macrophages and lymphocytes may follow similar pathways but this has not been so well studied. Quantification of the number of cells moving is also much more difficult as they have the ability to divide during their transit through the tissue. The lymphocytes may also follow specialised pathways in the lymphatic system that probably includes traffic through the bronchial associated lymphoid tissue (Klooster K, Slebos DJ .,2021).

Pathogenesis of emphysema: Many processes appear to be involved in the pathogenesis of emphysema associated with cigarette smoking, but the proteinase-antiproteinase hypothesis has prevailed as the central theme for nearly 40 years. According to this hypothesis, destruction of alveolar walls results from proteinase activity that digests extracellular matrix (ECM). The proteinase-antiproteinase hypothesis has considerable experimental support, but many specifics remain unsettled such as the cell types and proteinases responsible for ECM destruction and the ECM component that are targets of the proteinases (Azer SA, Awosika AO, Akhondi H.,2023). Mice are proving to be valuable in analysing the pathogenesis of emphysema associated with cigarette smoking. Animal models based on the mouse allow early stages of lung injury to be evaluated, where various therapeutic or other types of regimens can be imposed over relatively short experimental periods. Genetic manipulations can be readily accomplished allowing the role of specific gene products to be evaluated. Clearly, genetic factors are critical in the predisposition to emphysema from cigarette smoke exposure in mice. Differences in resistance to developing smoke induced emphysema between several strains of mice, for example, correlate with differences between the strains in the capacity to mount antioxidant responses to cigarette smoke. In contexts other than smoking, mice have been informative about mechanisms of emphysema and, at times, emphysema has been an unexpected finding in genetically abnormal mice (Klooster K, Slebos DJ .,2021).

The idea that emphysema results from chronic inflammation affecting alveoli and terminal airways has dominated this field ever since the discovery linking emphysema and α_1 -antitrypsin deficiency to neutrophil elastase (NE). Because NE is expressed almost exclusively by neutrophils, and because smokers have more neutrophils in their bronchoalveolar lavage (BAL) fluid than non-smokers, neutrophils have long been considered a major culprit in causing emphysema. However, macrophages, T lymphocytes, and eosinophils are increasingly being implicated in the pathogenesis of lung destruction in emphysema, and some data even suggest that the presence of neutrophils in alveolar walls in smokers correlates with preservation rather than destruction of alveolar walls. A recent analysis of inflammatory cells in the lung parenchyma and terminal airspaces in surgically resected lungs having no emphysema, mild emphysema, or severe emphysema found increased numbers of neutrophils, macrophages, T lymphocytes, and eosinophils in emphysematous tissue. The numbers of each inflammatory cell type correlated equally well with the severity of emphysema so that, by cell numbers, no one type of inflammatory cell appeared to predominate. Compared with normal lung, lungs with severe emphysema contained approximately 10 times more of each of the inflammatory cell types (Pahal P, Avula A, Sharma S .,2021).

These results show that a complex inflammatory response exists in the emphysematous lung. Precisely how the various inflammatory cell types contribute to the destruction of alveolar walls is yet to be determined, but a reasonable speculation would be that neutrophils, macrophages, and eosinophils degrade alveolar ECM directly by releasing proteinases whereas T lymphocytes influence inflammatory cell recruitment and the function of inflammatory cells that release proteinases. The remarkable expansion of the alveolar macrophage population in many smokers'

lungs may be important in producing alveolar destruction, even though proteinase release per cell may be similar between smokers with emphysema and smokers who do not have emphysema (Wand O, Kramer MR.,2018).An intriguing feature of these recent data is that the markedly increased number of inflammatory cells in severe emphysema was present even in individuals who had stopped smoking years earlier. This finding fits with the clinical situation of progressive deterioration of lung function among some former smokers with COPD. The mechanisms that perpetuate recruitment of inflammatory cells in lung tissue long after the primary stimulus—namely, cigarette smoke—has been removed are not known, but peptides derived from ECM are chemotactic for inflammatory cells which suggests that destruction of ECM may be self-perpetuating (Mumby S, Chung KF, Adcock IM.,2019).

Inflammatory cells may not be the only source of proteinases that degrade alveolar septal ECM. Alveolar epithelial cells in lungs removed for lung transplantation for COPD and in lung tissues resected at lung volume reduction surgery express the collagenase matrix metalloproteinase 1 (MMP-1) mRNA and protein, and exhibit collagenase activity. Similarly, in guinea pigs exposed to cigarette smoke, MMPs are expressed by lung structural cells. However, it is important to note that expression of MMPs by alveolar epithelium or other structural cells does not necessarily lead to emphysema as it also occurs in interstitial lung diseases (Pahal P, Avula A, Sharma S.,2021). While intrapulmonary inflammation appears to be a consistent feature of smoking and emphysema, three recent studies in rodents illustrate that emphysema can develop with minimal or no inflammation. Rats exposed to agents that interfere with the function of vascular endothelial growth factor (VEGFR) receptors have apoptosis of alveolar epithelial cells and capillary endothelial cells and develop emphysema-like lungs. TIMP-3 “knockout” mice undergo pathological alveolar enlargement beginning around 2 weeks postpartum without an increase in inflammatory cells. A single intratracheal instillation of β -D-xyloside in rats is followed by disturbed proteoglycan synthesis, parenchymal destruction, and airspace enlargement comparable to that attained with intratracheal pancreatic elastase and it occurs without inflammation. The relevance of these models to human emphysema is not clear, but the models suggest that diverse homeostatic mechanisms are required to preserve normal lung structure (Kerimova R.C., Veliyeva Z.Y.,2022).The diversity of inflammatory cell types in emphysematous tissue and the variety of proteinases produced by these cells raise the strong possibility that many proteinases might be involved in emphysematous lung destruction. This diversity also suggests that there might be differences between individuals and even in the same individual at different times. With the exception of emphysema associated with α_1 -antitrypsin deficiency, in which NE appears to be the critical proteinase, conclusively identifying the key enzymes in emphysema pathogenesis has proved difficult. The present brief discussion will focus on neutrophil elastase and MMPs because these are the proteinases most associated with emphysema. The possibility that NE is important in emphysema even among smokers with normal levels of α_1 -antitrypsin has considerable support. For example, smoking increases NE in BAL fluid, and smokers with CT scan evidence of emphysema have higher levels of neutrophil specific proteinases including NE in their BAL fluid than smokers without emphysema. The role of NE in causing emphysema may be principally via its capacity to degrade the elastin in elastic fibres, but other mechanisms may also operate. Mice lacking NE as a result of gene targeting show some protection from cigarette smoke induced emphysema caused by decreases in alveolar recruitment of neutrophils and monocytes, macrophage elastase activation, and degradation of TIMP-1, an inhibitor of macrophage elastase (Mumby S, Chung KF, Adcock IM.,2019). Over the past few years MMPs have gained support as proteinases involved in alveolar destruction in emphysema as this family of enzymes is associated with both physiological and pathological remodelling in many tissues including the lung. As a group, MMPs can degrade all components of the ECM. Members of the MMP family of enzymes are present in low to undetectable levels in normal lung, but are readily detected in many lung diseases. Macrophages can synthesise

several MMPs. In contrast, neutrophils do not synthesise MMPs once they have completed their development in the bone marrow, but they carry in their granules two MMPs—MMP-8 (neutrophil collagenase) and MMP-9 (gelatinase B). It is important to note that the expression of MMPs is not restricted to inflammatory cells; virtually all cells including alveolar epithelial cells and fibroblasts can make MMPs. Also, the potential substrates of MMPs are not limited to ECM as many other proteins, including α_1 -antitrypsin, are also cleaved by these enzymes (Martini K, Frauenfelder T.,2020).

Several MMPs have been implicated in the pathogenesis of emphysema (table 1). Interpretation of these data is difficult, however, because (1) most of it comes from moderate or advanced emphysema, (2) different types of samples have been analysed ranging from BAL fluid, alveolar macrophages in culture, to surgically resected lung tissue, and (3) the types of MMP measurements have been diverse, varying from enzymatic activity to immunological assays so that the issue of pro-enzymes versus active forms is not clear. Moreover, studies of alveolar macrophages in culture and of BAL fluid raise questions about the relationship of the findings to what is actually occurring in the tissue in vivo. Despite these concerns, at least two interesting findings have emerged: As shown in table 1, the MMPs associated with emphysema include the collagenases MMP-1, which is typically produced by fibroblasts, and MMP-8 which is found primarily in neutrophils. Because alveolar septal collagen turnover appears to occur in emphysema (see below), it would not be surprising if MMP-1 and MMP-8 have a role in alveolar septal destruction. Guinea pigs with cigarette smoke induced emphysema show collagenase mRNA and collagenase protein in alveolar macrophages, alveolar epithelial and interstitial cells, and have collagenase activity in lung homogenates, unlike lungs from control animals (Mortensen J, Berg RM.,2019). Also associated with emphysema are the so-called gelatinases MMP-2 and MMP-9. These proteinases degrade a number of ECM components, including type IV collagen and elastin. Neutrophils contain abundant MMP-9 that is readily released when the cells are stimulated. A polymorphism in the promoter of MMP-9 has been associated with an increased incidence of emphysema among smokers of comparable age (~65 years) and smoking history (~60 pack years). Increases in MMP-14 (also called MT-1 MMP) found in one study are intriguing, as this proteinase has a key role in the activation of MMP-2 in a process that occurs on cell surfaces. Human alveolar macrophages make MMP-12 (also called macrophage elastase), but its production appears to be less relative to other MMPs and much less than murine macrophages. This difference, and the fact that MMP-12 has not been found in several studies, suggests that, with regard to this enzyme, the mouse and human differ. Many of the early experimental studies supporting the proteinase-antiproteinase hypothesis pointed to elastin as the critical target of proteinases that cause emphysema. Indeed, this emphasis was so dominant that the hypothesis has also been labelled the elastase-antielastase hypothesis. Clearly, destruction of alveolar elastin does lead to emphysema experimentally and frayed elastic fibres are evident in alveolar tissue in human emphysema. However, focus on the importance of elastic fibres has obscured the fact that destruction of alveolar walls affects other ECM components, of which collagens are the most prominent quantitatively and morphologically. Interestingly, when experiments involving intratracheal instillation of enzymes to produce emphysema were in vogue a few decades ago, none was done with mammalian collagenases nor have such experiments been done yet (Weerakkody Y.,2021).

Experimental studies as well as examinations of human tissue point to collagen breakdown and resynthesis in emphysema. The likelihood that collagen turnover is a feature of the pathogenesis of emphysema is underscored by the prevalence of increased collagenolytic enzymes in human emphysema (table 1) and a small body of experimental data. Reductions in lung collagen can occur quickly in response to exposure to cigarette smoke, as increased levels of collagenous peptides are present in the BAL fluid of mice within 1 day of exposure to smoke from two

cigarettes. However, with chronic exposure in mice there is increased lung collagen concurrent with the development of emphysema, results that match observations of increased lung collagen content in human emphysema. Clearly, emphysema involves more than elastin degradation. Indeed, it is likely that the lung remodelling recognised as emphysema involves destruction and synthesis of all components of the lung ECM (Kerimova R.C., Ağayeva A.H., Abiyev H.Ə., 2023).

Your healthcare provider may order the following tests to diagnose emphysema:

Chest X-ray. Your healthcare provider will take X-rays of your chest to look at your lungs. They'll compare your lungs to X-rays of healthy lungs. X-rays are usually not helpful in detecting the early stages of emphysema. They're more useful in diagnosing moderate or severe emphysema (Weinberger S, Cockrill B, Mandel J., 2019).

CT scan. A CT scan creates a 3D image of your lungs. It provides more detailed images than an X-ray.

Pulmonary function testing. Pulmonary function tests measure how well your lungs inhale and exhale air. Testing may include spirometry. Spirometry uses a spirometer machine to measure the flow of air through your lungs. It also estimates the amount of air in your lungs (Wand O, Kramer MR., 2018).

Arterial blood gas (ABG). An ABG measures the amount of oxygen and carbon dioxide in the blood from an artery (arterial blood). An artery is a tube that carries blood away from your heart. Your healthcare provider may order an ABG if your emphysema gets worse. It can help determine if you need extra oxygen (Pahal P, Avula A, Sharma S., 2021).

Electrocardiogram (EKG). An EKG checks your heart function. Your healthcare provider may order an EKG to rule out heart disease as a cause of shortness of breath.

Blood tests and genetic tests. Your healthcare provider may order blood tests and genetic tests to confirm alpha-1 antitrypsin deficiency as a cause of emphysema (Mortensen J, Berg RM., 2019).

Treatment of emphysema: Emphysema can worsen over time, so treatment focuses on slowing emphysema down and maximizing the function of your remaining healthy lung. The type of treatment depends on the severity of your emphysema.

Treatment options may include: Quitting smoking. If you smoke, the best way to slow down emphysema is to quit. It's the most important step you can take to protect your lungs. You and your healthcare provider can work together to find the best, most effective methods to quit smoking (Weinberger S, Cockrill B, Mandel J., 2019).

Bronchodilators. These medicines relax the muscles around your airways. When these muscles relax, more air comes in and out of your lungs. They're faster and more effective than oral medications. Bronchodilators also help treat asthma and other lung conditions.

Inhaled corticosteroids. Inhaled corticosteroids reduce swelling in your airways and mucus production. You may have to take inhaled corticosteroids every day to help prevent emphysema symptoms.

Oral corticosteroid. A provider often prescribes short courses of oral corticosteroids when you're having an exacerbation or "flare" of your emphysema (Azer SA, Awosika AO, Akhondi H.,2023).

Antibiotics. Antibiotics help treat bacterial infections, including pneumonia, bronchitis and other lung infections.

Anti-inflammatory medications. Anti-inflammatories reduce inflammation in your airways.

Oxygen therapy. If your lungs aren't getting enough oxygen to your blood (hypoxemia), oxygen therapy can help. A machine will deliver more oxygen to you through a nasal catheter or a facemask. A nasal catheter (nasal cannula) is a flexible tube that your healthcare provider will clip to your nose (Weerakkody Y.,2021).

Lung volume reduction surgery (LVRS). During LVRS, your healthcare provider removes a portion of your diseased lung tissue and joins the remaining tissue together. Removing the damaged tissue may relieve pressure on your breathing muscles and help improve your lungs' ability to stretch. LVRS results are usually promising. However, not all people with emphysema are candidates for this surgery (Kərimova R.C., Ağayeva A.H.,Abiyev H.Ə.,2023).

Bronchoscopic lung volume reduction. During bronchoscopic lung volume reduction, a provider places a one-way valve into your airways. The valve allows air to leave those sections of your lungs, but not enter. This helps decrease the amount of "trapped" air that's in your lungs and makes it easier to breathe. Not all people with emphysema are candidates for this procedure (Martini K, Frauenfelder T .,2020).

Lung transplant. If you have severe emphysema and your lungs don't respond to other treatment options, a lung transplant replaces your damaged lungs with a donor's healthy lungs (Azer SA, Awosika AO, Akhondi H.,2023).

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PATHOPHYSIOLOGY OF DIABETES CAUSED BY IRON DEFICIENCY

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ABSTRACT

Macronutrients play an undisputed role in conferring an increased risk of type 2 diabetes mellitus (T2DM), but the micronutrient iron is also a risk determinant, not only in pathologic excess or deficiency, but also within its very broad range of normal levels. This review addresses the evidence for a connection between iron and diabetes risk, first providing a brief review of iron homeostasis and the evidence linking tissue iron levels with diabetes in humans. Because in many cases the aforementioned topics have been the subject of detailed reviews, this review concentrates on mechanistic studies addressing how iron regulates metabolism in the principal tissues that determine glucose homeostasis.

Keywords: Iron deficiency, Diabetes, Disease, Pathophysiology

Macronutrients play an undisputed role in conferring an increased risk of type 2 diabetes mellitus (T2DM), but the micronutrient iron is also a risk determinant, not only in pathologic excess or deficiency, but also within its very broad range of normal levels. This review addresses the evidence for a connection between iron and diabetes risk, first providing a brief review of iron homeostasis and the evidence linking tissue iron levels with diabetes in humans (Crewe C, Funcke JB, Li S, Joffin N, Gliniak CM et al. 2021).

Because in many cases the aforementioned topics have been the subject of detailed reviews, this review concentrates on mechanistic studies addressing how iron regulates metabolism in the principal

tissues that determine glucose homeostasis. We hope to support the overarching hypothesis that the central importance of iron availability to fuel metabolism and mitochondrial function has resulted in a tight coupling of iron availability to metabolic regulation. Not surprisingly, the role of iron extends to most aspects of metabolism—lipid, protein, nucleic acid, and carbohydrate—but this review concentrates on the regulation of glucose homeostasis (Kərimova R. C., Ağayeva A.H., Quliyeva N.T., İsmayılova K., 2023).

Overview of iron metabolism: Early organisms evolved to take advantage of iron for metabolic and other redox reactions. In parallel, there also evolved an important link between iron availability and metabolism. Fuel choice in yeast, for example, is tightly and reciprocally coupled to iron, and many of those mechanisms are conserved in humans. While necessary for metabolism, iron is also a potent oxidant, and complex systems to regulate its uptake, storage, and bioavailability also evolved. Some key components of those systems include: Regulated iron entry into the bloodstream from the gut through the iron export channel ferroportin (SLC40A1); Binding of iron in the circulation to transferrin and endocytic uptake into cells by the transferrin receptor; An independent uptake pathway mediated by lipocalin 2, especially important in early development; Secretion by the liver of the peptide hepcidin in response to sensing of transferrin-bound iron, leading to negative feedback regulation of ferroportin; A rapid intracellular response system to rising iron mediated by iron regulatory proteins (IRPs) bound to the messenger RNAs (mRNAs) of key proteins. Free iron releases the IRPs from the mRNAs, posttranscriptionally downregulating the transferrin receptor mRNA to block further iron uptake and initiating translation of the iron storage protein ferritin that sequesters excess iron; and An autophagic mechanism (ferritinophagy) to mobilize ferritin-bound iron in situations of iron deficiency (LaMoia TE, Shulman GI. 2021).

Other components—the bone marrow-derived erythroferrone, a large number of intracellular chaperones, and mechanisms for incorporation of iron into heme- and iron-sulfur-complexes—add layers of complexity and regulation. While much of the regulatory system serves to protect from iron excess, after the agrarian revolution, iron deficiency also became a significant problem for human health and is today the most common nutritional deficiency in developing countries. In the face of this more recent pressure, the most common human mutations affecting iron homeostasis increase iron availability by damping the iron regulatory system. For example, mutations of HFE, a protein involved in triggering hepcidin release, were adaptive 10–20,000 years ago in areas of Europe where dietary iron intake was low, but they cause iron overload [hereditary hemochromatosis (HH)] when intake is higher. Anemia secondary to inadequate dietary iron and conditions such as hookworm infection led to the iron fortification of foods in the 1940s. Combined with increased red meat consumption—heme iron is absorbed ~20-fold more efficiently than elemental iron—iron excess now exists in a substantial portion of the US population (Kərimova R. C., Ağayeva A.H., Quliyeva N.T., İsmayılova K., 2023).

High tissue iron does not come without cost. We review the causal association of high iron with diabetes, but increased iron stores are associated with numerous diseases that also share aging and overnutrition as risk factors. For example: High iron is associated with not only T2DM but also nonalcoholic steatohepatitis (NASH), Parkinson's and Alzheimer's diseases, colon/breast cancer, and cardiovascular disease. Telomere length, a biomarker of many age-related diseases, is inversely related to tissue iron.

Brain iron is among the best predictors of τ -protein tangles and cognitive decline in Alzheimer's disease. Metformin, an antidiabetic drug also being tested as an antiaging and anticancer agent, was recently demonstrated in yeast to primarily induce an iron starvation response (Wang D, Zhang H, Zhang Y, Wang J et al. 2021).

Iron and diabetes risk:The dangers of excess iron were first recognized in conditions of pathologic iron overload such as HH, which is associated with diabetes, NASH, cardiomyopathy, and other complications. The key pathogenic mechanism for diabetes in HH is insulin deficiency, and a causal role for iron has been demonstrated by improvements in insulin secretion after iron reduction by phlebotomy. Increased risk of diabetes is also seen with transfusional iron overload in conditions, including beta thalassemia, and post-bone marrow transplant. Similar to HH, in thalassemia, aggressive iron chelation therapy is associated with a reduction in the incidence of diabetes. Important differences in disease pathophysiology exist among these conditions, at least partly related to the fact that HH is a low-hepcidin state, whereas transfusional iron overload (or dietary excess) is characterized by high hepcidin. High hepcidin will downregulate the export channel ferroportin, causing any cell or tissue with significant ferroportin expression to be iron overloaded. In iron overload resulting from low hepcidin states, such as HH, in contrast, the same cells will be paradoxically iron underloaded with low hepcidin due to the failure to downregulate ferroportin. Among the cells with high ferroportin that contribute to diabetes pathogenesis are macrophages and adipocytes, and both play roles in the effects of iron on metabolic regulation that are quite different between HH and dietary iron overload. Iron overload from transfusions is, like HH, associated with insulin deficiency, but unlike HH and because of high hepcidin and resultant high iron in adipocytes and macrophages, transfusional overload is also associated with another canonical feature of T2DM, insulin resistance. Recently it has become clear that iron is also a risk factor for typical T2DM, a risk that increases progressively in the general population through the entire normal range of serum ferritin, a marker of tissue iron stores. This association has been reviewed extensively and confirmed in a recent meta-analysis. The risk is manifest in multiple races and ethnicities and also seen in gestational diabetes and prediabetes. Like pathologic iron overload, a causal relationship between iron and diabetes is shown by the facts that high-normal iron is sufficient to cause diabetes in rodents and, in small studies, iron reduction has been shown to improve glycemia in human T2DM (LaMoia TE, Shulman GI. 2021).

Further details on individual studies linking diabetes and iron epidemiologically can be accessed through the reviews cited above, but this review focuses on tissue-specific aspects of disease pathogenesis. The use of ferritin as a marker for tissue iron by many of these studies, however, does merit comment. Ferritin can also be a marker of systemic inflammation, and given the role of inflammation in obesity and T2DM, the question arises whether ferritin is primarily reflecting inflammation or tissue iron. It is true that in cases of extreme inflammation like sepsis, or when iron levels are undergoing large fluxes such as in iron reduction therapy, ferritin may temporarily lose its coupling to tissue iron levels. Nevertheless, ferritin is a reliable surrogate for tissue iron in the general population. In one of the largest studies linking ferritin to diabetes risk, high ferritin was accounted for by increased dietary iron intake and was seen in the absence of elevations in markers of inflammation. When iron is assessed by more specific measures (e.g., biopsy or magnetic resonance imaging), even in the setting of inflammatory states such as sickle cell disease and biopsy-proven NASH, ferritin still mainly reflects iron stores rather than inflammation. The contribution of obesity per se to serum ferritin levels is likewise only a small percentage of the large normal range of ferritin (Winn NC, Volk KM, Hasty AH. 2020).

Organ-specific mechanisms underlying the contribution of iron to diabetes:Consistent with the fundamental roles of iron in so many aspects of metabolism, mechanistic studies have revealed numerous pathways through which iron regulates fuel homeostasis, weight, appetite regulation, and hormone secretion. Some of these effects, as well as elements of the signal transduction pathways mediating them, are shown in. Many of these have been elucidated in animal models of pathological iron overload and in wild-type mice on different levels of dietary iron. The latter models were developed to represent the very broad range of normal tissue iron levels in normal humans as well as overt iron deficiency. Our group has, for example, used mice on diets containing 4 mg, 35 mg, and 2,000 mg of elemental iron per kilogram of chow. If mice after weaning are initially fed a diet of

normal iron (usually 35 mg/kg) for 2 months before starting the defined diets, the 4 mg/kg diet allows normal fertility and maintenance of normal blood hemoglobin concentrations for at least 8 months of life. Mice fed the 4 mg/kg diet at weaning, however, become anemic and are a model of iron deficiency (Winn NC, Volk KM, Hasty AH. 2020).

Thirty-five mg/kg iron is a good approximation of the diet of a mouse in the wild. Mice on 2,000 mg/kg show time-dependent higher tissue iron levels, and after a few months on the high iron diet hepatic iron stores are ~4 times those seen in the mice on the low-normal iron diets, well within the ~10-fold range of hepatic iron seen in healthy humans. In considering animal model data, it should be remembered that: Accumulation of dietary iron in tissues increases over time in the higher-iron diets. More rapid iron overload can be achieved with parenteral infusions, but these methods carry with them potential complications. Accumulation of iron is not linear with the levels in the chow because of negative feedback provided by hepcidin. Iron parameters differ in different strains of mice .

Iron and insulin secretion: Loss of insulin secretion is a hallmark of all common forms of diabetes and also associated with iron-related diabetes resulting from either pathologic iron overload or dietary excess. As is the case especially for T2DM, multiple mechanisms contribute to this loss of insulin secretion (Ma W, Jia L, Xiong Q, Feng Y, Du H. 2021).

Excess iron and beta cell survival: One major contributor to the loss of insulin secretory capacity in diabetes caused by high iron is oxidative stress. Because of the fine-tuning of the redox state required for normal insulin secretion, the beta cell is particularly sensitive to reactive oxygen species (ROS). A canonical pathway for iron-induced cell damage is the generation of free radicals and other ROS from peroxides (Fenton chemistry), but the processes of iron toxicity in islets are more numerous, complex, and nuanced. One of the principal antioxidant-protective enzymes in pancreatic beta cells is glutathione peroxidase 4 (GPx4), and its activity in reducing lipid peroxides plays a particular role in protection from iron-induced damage and death in those cells. Thus, overexpression of GPx4 can rescue islets from stress induced by high iron and high glucose. This may play a particularly important role in both T2DM and iron overload, wherein GSH (the substrate oxidized in the GPx4 reaction) and GPx4 are diminished .In addition to its antioxidant role, GSH is also central to iron trafficking and many iron-dependent pathways such as iron-sulfur cluster synthesis and triggering ferroptosis, an iron-dependent noncaspase-mediated cell death pathway that involves GSH-dependent GPx and lipid oxidation. Ferroptosis plays an important role in cellular senescence , a significant pathway of beta cell loss in diabetes. Iron and ferroptosis also participate in beta cell loss secondary to glucolipotoxicity, and inhibition of ferroptosis can rescue islets from stress induced by high iron and high glucose. All of these mechanisms likely contribute to the finding that iron chelation improves islet survival in transplantation models (Crewe C, Funcke JB, Li S, Joffin N, Gliniak CM et al. 2021).

There are likely other reasons for the particular sensitivity of beta cells to high iron. Beta cells express high levels of the nonspecific divalent metal transporter 1 (DMT1), required for entry into the cytosol of not only iron but also other metals, including zinc, which beta cells require for insulin packaging in secretory granules. Although most cellular iron uptake is mediated by the transferrin receptor, iron can be taken up directly by DMT1. This process would be accentuated in pathologic iron overload with high transferrin saturation and resultant labile or nontransferrin-bound iron. DMT1 is also upregulated by inflammatory cytokines, which could further accentuate that process. Even under normal iron conditions mouse beta cells lacking DMT1 are protected against damage from inflammatory cytokines and in both type 1 and type 2 diabetes models. Beta cells lacking DMT1 also exhibit defective glucose-stimulated insulin secretion, implying a physiological role for DMT1, but whether that is related to iron or to entry of other metals (e.g., zinc or manganese for metallation of superoxide dismutase 2) is not known (Yook JS, You M, Kim Y, Zhou M, Liu Z et al. 2021).

The exocrine pancreas also accumulates iron, so damage to beta cells through their proximity to inflamed acinar cells has also been posited as a potential mechanism for resultant diabetes. Those authors, in fact, questioned whether iron had any effects on islets, stating that histochemical staining of islets of mice lacking hepcidin did not reveal excess iron and that those mice did not have impaired glucose tolerance. In fact, however, their data show a phenotype very similar to and consistent with the low hepcidin state. Namely, mice that lack the HFE protein commonly mutated in HH exhibit enhanced insulin sensitivity and improved glucose tolerance until the loss of beta cells reaches a critical level, as discussed in. The latter study found high iron in islets in the HFE mutant mice but by using a more sensitive methodology (LaMoia TE, Shulman GI. 2021).

Iron and coupling of glucose metabolism to insulin secretion: Although loss of insulin secretory capacity is certainly related to the loss of beta cell mass induced by high iron, there is also evidence that coupling of insulin secretion to increased glucose levels is also influenced by iron. Thus, the mouse model of HH is characterized by not only decreased insulin secretory capacity but also a rightward shift in the glucose-insulin secretion dose-response curve. While diminished mitochondrial glucose oxidative capacity likely plays a role, other factors are also at work. GSH, whose levels are low in diabetes, is also important for coupling glucose to the stimulation of insulin secretion through the isocitrate-to-SUMO-specific peptidase 1 pathway. Another potential link of this pathway to iron is the fact that cytosolic aconitase, which converts citrate to isocitrate, is iron sensitive and is also one of the iron regulatory proteins (IRP-1) responsible for iron sensing (Altamura S, Schlotterer A, Heidenreich E et al. 2020).

Iron deficiency and insulin secretion: Iron deficiency can also impair insulin secretion, as demonstrated in mice with deletion of DMT1. This is not surprising given the importance of iron to mitochondrial metabolism and its requirement for normal glucose-stimulated insulin secretion. Although a plausible explanation is the insufficient metalation of mitochondrial proteins required for glucose oxidation and stimulation of insulin secretion, other pathways are also involved. Leibold and colleagues, for example, have shown that loss of the iron-regulatory protein IRP-2 results in functional iron deficiency in beta cells. This, in turn, results in insulin deficiency from abnormal transfer RNA (tRNA) processing, leading to reduced synthesis and processing of proinsulin. Given the breadth of cellular processes that require and are regulated by iron, it is likely that many other pathways will also be found to be involved (Yook JS, You M, Kim Y, Zhou M, Liu Z et al. 2021).

Iron and type 1 diabetes: In addition to the work focusing on T2DM, studies have also associated the development of type 1 diabetes with dietary iron intake. Fewer mechanistic studies have been done in this arena.

Iron and the liver: Interactions among iron, diabetes, hepatic function, and hepatic damage present a complex picture. Features of metabolic syndrome have been linked to iron overload syndromes featuring the accumulation of iron in hepatic Kupffer cells, hyperferritinemia, relatively preserved hepcidin-mediated modulation of iron homeostasis, and normal circulating iron levels, a condition termed dysmetabolic iron overload syndrome (DIOS). In DIOS, there is evidence for both insulin resistance contributing to iron overload and conversely iron overload contributing to insulin resistance, but the interactions among all of these factors cannot yet be fully disentangled. For example, iron is a risk factor for both diabetes and nonalcoholic fatty liver disease (NAFLD), and diabetes itself is also a common and major risk factor for NAFLD and cirrhosis. Conversely, cirrhosis is a risk factor for T2DM even when caused by an independent process such as viral hepatitis. This is illustrated in hemochromatosis, where iron is sufficient to cause cirrhosis without diabetes, and vice versa, but in those without hemochromatosis, the increased risk of diabetes seen with higher serum ferritin is accentuated in those individuals who also show evidence of hepatic damage (Altamura S, Müdder K, Schlotterer A, Fleming T, Heidenreich E et al. 2021).

Thus, sorting out primary causality in these syndromes can be daunting. Mechanistic studies are beginning to elucidate the molecular pathways involved in these interactions, for example, transforming growth factor β (TGF- β) signaling in the iron-dependent progression of NAFLD. Thus, a better understanding of the multiple and complex relationships among insulin resistance, fatty liver, diabetes, and iron is proceeding. In the face of these many unknowns, this section concentrates specifically on the demonstrated effects of iron on insulin action and glucose metabolism. Hepatic insulin resistance, at least for the control of hepatic glucose production, is a hallmark of T2DM. Increased levels of Fe^{2+} induced by increasing heme oxygenase in liver likewise increase both insulin resistance and gluconeogenesis. Increased hepatic gluconeogenesis is also seen in a mouse model of hereditary hemochromatosis. Conversely, iron restriction causes hypoglycemia in a mouse model in part by decreasing hepatic pyruvate utilization for gluconeogenesis, driven by activation of the hypoxia sensing pathway. A novel effect of iron is to alter the circadian rhythm of hepatic glucose production. Gluconeogenesis is normally suppressed during the usual feeding period (in humans during the day and in mice at night) and augmented during fasting. Disruption of this rhythm is associated with T2DM in experimental animal models and in humans, contributing to the diabetes risk seen in night shift workers. Although feeding, light/dark cycling, and glucoregulatory hormones all play roles, dietary iron also affects circadian gluconeogenesis. The effect of high dietary iron is to decrease the magnitude of the effects of circadian glucose metabolism through heme-mediated regulation of the interaction of nuclear receptor subfamily 1 group d member 1 (Rev-Erb α) with nuclear receptor corepressor 1 (NCOR). Increased heme is driven by upregulation of aminolevulinic acid synthase 1 mediated by peroxisome proliferator-activated receptor γ coactivator 1 α (PGC-1 α). Metformin exerts much or most of its antidiabetic action by inhibiting hepatic gluconeogenesis. Thus, a recent finding in yeast linking iron to metformin action may be relevant to understanding the mechanistic underpinnings of metformin action and the relation of iron to gluconeogenesis. The authors discovered a global cellular response to metformin that is similar to that of iron starvation with effects not only on glycolysis and glucose oxidation that mirror effects of metformin in human liver, but also changes in DNA repair, activity of the mechanistic target of rapamycin pathway, and others that also are seen in higher organisms. Future work should clarify the relevance of this important finding to our understanding of iron and diabetes risk (Rametta R, Fracanzani AL, Fargion S, Dongiovanni P. 2020).

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**TREATMENT, COMPLICATIONS AND DIAGNOSIS OF COLONOSCOPY
EXAMINATION**

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ABSTRACT

A colonoscopy is a vital tool utilized in modern medicine today. Its versatility and utility make it a vital life-saving procedure, both in the short and long term setting. It can be used for oncological and non-oncological conditions, including sigmoid volvulus, gastrointestinal bleeding, and colonic impactions. Screening colonoscopy is important to detect and treat early colorectal cancers. Colonoscopy is a diagnostic as well as a therapeutic procedure performed to evaluate the large intestine (i.e., colon, rectum, and anus) as well as the distal portion of the small intestine (terminal ileum). It is performed using a hand-held flexible tube-like device called the colonoscope, which has a high definition camera mounted at the tip of the scope, as well as accessory channels that allow insertion of equipment and fluids to cleanse the colonoscope lense and colonic mucosa.

Keywords: Colonoscopy, Examination, Treatment, Complications, Diagnostics

A colonoscopy is a vital tool utilized in modern medicine today. Its versatility and utility make it a vital life-saving procedure, both in the short and long term setting. It can be used for oncological and non-oncological conditions, including sigmoid volvulus, gastrointestinal bleeding, and colonic impactions. Screening colonoscopy is important to detect and treat early colorectal cancers. Colonoscopy is a diagnostic as well as a therapeutic procedure performed to evaluate the large intestine (i.e., colon, rectum, and anus) as well as the distal portion of the

small intestine (terminal ileum). It is performed using a hand-held flexible tube-like device called the colonoscope, which has a high definition camera mounted at the tip of the scope, as well as accessory channels that allow insertion of equipment and fluids to cleanse the colonoscope lense and colonic mucosa. The visual data that the camera feeds to the screen helps to detect abnormalities as well as overgrowth of the colonic wall and, in turn, allows us to evaluate, biopsy, and remove mucosal lesions using different types of biopsy instruments through these accessory channels. With such immense utility, colonoscopy has moved at the forefront of making colorectal cancer an easily preventable and early detected disease over the last few decades (Patel G, Patel R., 2024).

The gastrointestinal system is divided into the foregut, midgut, and hindgut. Respectively, the foregut consists of the mouth to the second portion of the duodenum (part of the small intestine), the midgut consists of the remaining duodenum (third and fourth portion) to about two-thirds the distance of the transverse colon and the hindgut consists of the distal one-third colon to the anus. This is important to remember when it comes to lesions and pathology throughout the colon, as this will help decide future surgical planning, especially with the colon. The part of our gastrointestinal system after the stomach is divided into the small and the large intestine. Going from proximal to distal, the small intestine is further divided into the duodenum, jejunum, and ileum. The ileum ends at the ileocecal valve, which opens into the first part of the large intestine. This is called the cecum, which is a pouch-like structure and further continues as ascending colon, followed by the transverse, descending, and the sigmoid colon. The colon opens into the rectum, which terminates as the anal canal. The total distance from the anus to the cecum varies from male to female but can be generalized at around 120 cm to 160 cm. The ascending colon, hepatic flexure, and transverse colon constitute the right colon, whereas the descending colon, splenic flexure, and sigmoid make the left colon. As a general rule of thumb, the diameter of the cecum, transverse colon, and descending colon are 9 cm, 6 cm, and 3 cm, respectively. This is important to remember when navigating through a colonoscopy and identifying the location within the colon (Patel G, Patel R.,2024).

Colonoscopy can be performed for multiple reasons. It can be divided into diagnostic and therapeutic indications. Diagnostic indications can further be classified as screening vs. elective. Screening colonoscopies are performed to assess for colorectal cancers based upon a patient's risk (average vs. high). Average risk screening starts at the age of 50 and is performed at least every 10 years, as long as the colonoscopy results were unremarkable or no pathology identified that would place the patient at a higher risk. Patients will receive a repeat colonoscopy at 10-year intervals to continue to screen for colorectal cancer or pre-malignant lesions. The subsequent colonoscopies are called surveillance colonoscopies. Earlier surveillance is performed depending on the results of the first (index) procedure (Ahmed R, Santhirakumar K, Butt H, Yetisen AK.,2019).

Patients with a high risk of developing colorectal cancer receive the screening procedure before the age of 50 years, and it is repeated every 1, 2, or 5 years based upon the primary risk and findings during the procedure. Examples of high-risk populations include a history of inflammatory bowel disease, a family history of colorectal cancer at age <60 years, hereditary polyposis (Such as Peutz Jegher syndrome and Familial Adenomatous Polyposis, caused by an APC gene mutation) and non-polyposis syndromes (LYNCH I and II), and surveillance after resection of colorectal cancer. Individuals with first degree relatives diagnosed with colon cancer are encouraged to undergo their first colonoscopy at age 40, or 10 years prior to the age the relative was diagnosed, whichever comes first. Elective colonoscopy is performed for reasons such as known or occult gastrointestinal bleeding or stool positive for occult blood, unexplained changes in bowel habits, patterns, iron deficiency anemia or weight loss in elderly patients, persistent abdominal pain, suspected inflammatory or infectious colitis and barium

enema showing radiographic structural abnormalities (Patel G, Patel P, Sonara Z, Patel R.,2023).

Therapeutic indications for colonoscopy include, but are not limited to, excision and ablation of lesions, treatment of bleeding lesions, dilation of stenosis or strictures, foreign body removal, decompression of colonic volvulus or megacolon and palliative management of known neoplasms (Çapak NE ,Derbyshire E ,Taylor J .,2019).

Technique or treatment: Performing a colonoscopy requires practice and is a skill that is difficult to master. While watching an experienced clinician perform a colonoscopy may appear simple, the technique is something that requires time, patience, and a lot of practice. Navigating through a cylindrical tube that can flex, dilated, contract, and move is not an easy task. In addition, patient factors such as obesity, redundant colonic tissue, surgical history, compliance with bowel preparation, and underweight individuals all need to be accounted for when preparing for a colonoscopy. For a clinician to become proficient in colonoscopy, this requires several hours on a simulator, as well as proctored colonoscopies with an experienced surgeon or gastrointestinal specialist (Patel R, Yadav BK, Patel G.,2022).

It is crucial that the clinician is familiar with the equipment and tests it before starting the colonoscopy. As mentioned before, there are many components to the colonoscope. Manipulating all elements (up, down, right, left, clockwise, and counterclockwise rotation) of the scope adds to the complexity of the procedure (Stauffer CM, Pfeifer C.ç2023).

The patient should be positioned in the left lateral decubitus position. Although, some clinicians may prefer the patient on their back or right side if circumstances require. On the left-sided position, the patient's legs should be flexed, and pillows should be placed around their back, head, and between their knees to help prevent injury to the bony prominence and to help maintain position. The technician or nurse is there to assist with preserving stability and preventing the patient from rolling forward or backward. Also, they are there to help provide counter pressure to the abdomen to assist the endoscopist in navigating corners and turns. The legs being flexed toward the chest help to relax the puborectalis and pubococcygeus muscles. This allows for easier entry and traversing past the angle at the sacral prominence. Failure to achieve this position makes navigation past the rectum at the level of the sacrum more difficult (Patel G, Patel P, Sonara Z, Patel R.,2023).

The endoscopist should be standing behind the patient. Before inserting the scope, it is essential to perform a digital rectal exam (DRE) with a water-soluble lubricant. At this time, the clinician should be feeling for any lumps, bulges, rectoceles, or masses. In addition, they should take note of the rectal tone but must also take into account the level of sedation the patient has achieved, as this may affect the tone of the anus. Following the DRE, The handle of the scope should be in the left hand of the clinician, and the endoscope should be placed in the right hand about 10 cm to 20 cm from the working end or lense of the scope. A generous amount of water-soluble lubricant should again be used to help prevent injury to the sensitive tissue of the anus. Using all components of the scope (up, down, left, right, and rotation), the endoscope is navigated through the different levels of the rectum, colon, and terminal ileum (Stauffer CM, Pfeifer C.ç2023).

Complications: As with every invasive procedure, there are inherent complications that should be known and described to the patient before proceeding. Generic complications such as reactions to anesthesia, including stroke, heart attack, respiratory distress, and death, are always associated with sedating procedures and should be described during consent. Specific to colonoscopies, patients should be notified that there are risks of rectal tears, bleeding, pain,

bloating, and infection. A more serious complication that can occur, although rare, includes intestinal perforation. The risk of perforation has been described at around 0.14% (or 1 in 1000 colonoscopies). Generally speaking, the risk of perforation with colonoscopy is particularly low, and the procedure relatively safe. This makes it an excellent screening modality for colon cancer with low risk, respectfully. Perforation can occur anywhere throughout the colon and terminal ileum. But it has been described frequently that the most common site of perforation is in the sigmoid colon. Perforation occurs primarily by three different methods; Shear injury, secondary to push and pull against the colonic wall, overdistention from too much insufflation against a weakened colonic wall, and perforation via mechanical polypectomy and electrocautery. Each turn or corner in the colon acts as a focal point for the scope to push against so that it can advance through the colon. Manipulation maneuvers via the assistant pushing against the abdominal wall can help mitigate some of the push and pull forces and help prevent potential injury. The sigmoid colon, being the first corner or turn in the large intestine, has the highest risk of injury as it incurs the highest amount of force as the scope advances to the cecum (Shah S, Patel R, Patel G.,2023).

Another complication, although rare, that the clinician should be aware of includes post polypectomy electrocoagulation syndrome (PPES). When a polyp is removed, electrocautery is used to fulgurate any remaining cells that may have been left behind. While the risk of transmural burn is low, it can occur if the clinician does not lift the tissue away from the colonic wall while applying electrocautery. Patients may present with severe abdominal pain several hours following a colonoscopy in which polypectomy with electrocautery was performed. Labs may demonstrate a leukocytosis with left shift and a CT that shows distended bowel and inflammatory changes, but no signs of pneumoperitoneum. It is treated with bowel rest, supportive care, antibiotics, and resolves without any need for surgical intervention. To help reduce the chances of developing PPES, the clinician can lift the polyp away from the colonic wall during electrocautery. In addition, normal saline can be injected beneath the polyp to elevate the mucosa away from the colonic wall creating an insulating type layer (Patel R, Yadav BK, Patel G.,2022).

Clinical significance:As previously mentioned, the USPSTF recommends screening colonoscopy starting at age 50 for average-risk individuals and should continue every 10 years until the age of 75. The basis for this decision stems from the understanding that for the average-risk individual, the time from polyp to cancer is estimated at around 10 years (Amlani B, Radaelli F, Bhandari P.,2020).

During the colonoscopy, the clinician should be looking for any suspicious lesions that would warrant removal, shorten surveillance intervals, or indicate surgical and oncologic consultation. Any suspicious polyps that are identified should be removed and sent to pathology. In general, hyperplastic polyps harbor little to no risk for colorectal malignancy. Adenomas, on the other hand, are considered suspicious lesions and should be removed if > 6 mm or harbor concerning features. The method of removal depends on the size and shape of the polyp. Pending polyp size and appearance, the endoscopist should consider tattooing the location so that it may be more easily identified on repeat colonoscopy or for surgical intervention (Shah S, Patel R, Patel G.,2023).

Bleeding frequency and risk factors: Diagnostic colonoscopy with mucosal biopsies has a minimal risk of bleeding. Recent meta-analyses have reported overall bleeding rates of 2.4–2.6/1000 colonoscopies with a significantly higher rate of bleeding after polypectomy (9.8/1000).However, studies reporting post polypectomy bleeding rate are confounded by heterogeneity of definitions of intraprocedural and post polypectomy bleeding. Risk factors for post polypectomy bleeding include patient comorbidities such as cardiovascular and chronic

renal disease, polyp size ≥ 10 mm, pedunculated polyps with thick stalks, multiple polyps, depth of submucosal resection (presence of muscle fibres and submucosal haematoma), recent use of anticoagulation and antiplatelets (except aspirin) and right-sided location (Ahmed R, Santhirakumar K, Butt H, Yetisen AK.,2019).

Recognition: Bleeding may occur immediately or can be delayed up to 2 weeks after the procedure. Delayed bleeding is more likely in patients who are on antiplatelets or anticoagulation following the procedure. It is important to differentiate between minor bleeding associated with polypectomy, which is controlled at the time of procedure, and significant haemorrhage, which is defined as visible blood or melaena following polyp resection, resulting in a fall of haemoglobin by >20 g/L, and requiring hospital admission, blood transfusion, surgery or further endoscopic therapy. It is critical that patients are not only advised of the risk of bleeding after the procedure but are given written advice on how to seek medical advice should they notice bleeding following discharge (Hayman CV, Vyas D.,2021).

Management and prevention: ESGE and the BSG have produced a joint guideline to mitigate the risk of bleeding for patients on antithrombotics undergoing endoscopic procedures, these should be followed when advising patients regarding adjusting their medications. Routine endoscopic treatment of all polypectomy sites to prevent bleeding is not cost-effective. A meta-analysis reported that prophylactic treatment with either mechanical therapy (including clips and endoloops) or epinephrine-saline injection reduced the risk of early bleeding but did not influence the rate of delayed bleeding. Another meta-analysis on the prophylactic role of clipping did not show a significant reduction in bleeding rates (Amlani B, Radaelli F, Bhandari P.,2020).

In almost all cases of immediate or delayed post colonoscopy bleeding, it should be possible to manage bleeding with supportive care and endoscopic therapy. Intraprocedural bleeding can be managed by use of endoscopic coagulation (eg, coagulation forceps or snare-tip soft coagulation) or mechanical therapy, for example, TTS clips, with or without the combined use of dilute epinephrine injection. A TTS clip can be applied directly on the bleeding stalk or vessel or the area adjacent to the polypectomy site to provide a tamponade effect on the surrounding blood supply. In case of delayed bleeding, if a patient is haemodynamically compromised or has ongoing bleeding, an attempt at endoscopic management should precede surgery. ESGE suggests that less than 5% of patients experiencing post polypectomy bleeding should require surgery (Stauffer CM, Pfeifer C.ç2023).

Splenic injury frequency and risk factors: Splenic injury is a rare but potentially fatal complication of colonoscopy, with mortality of up to 4.5%. It can result from direct trauma when the colonoscope is traversing the splenic flexure or rupture of the splenic capsule due to traction on the spleno-colic ligament or from pre-existent adhesions. Splenic injury can be parenchymal, subcapsular or with intraperitoneal extension. Large series have reported rates of 1 to 4.5/10 000 colonoscopies. Risk factors include previous abdominal surgeries, splenomegaly, endometriosis, inflammation (inflammatory bowel disease, diverticular disease, pancreatitis) and anticoagulant use. Case reports have also been documented in patients with connective tissue disorders such as Ehlers-Danlos syndrome (EDS), specifically vascular EDS, and in Marfan syndrome. In such cases, non-invasive testing may be preferable prior to considering colonoscopy and a discussion with the patient about the increased procedural risks is necessary (Çapak NE ,Derbyshire E ,Taylor J .,2019).

Presentation and recognition: Presentation can be non-specific and variable in timing, so a high degree of suspicion is necessary. Patients can present with diffuse abdominal discomfort or pain localised to the left upper quadrant. It can be associated with left shoulder pain (Kehr's

sign). Symptoms can develop immediately or, less frequently, delayed by days. Rarely cases can present with shock. Investigations may show anaemia. CT with intravenous contrast is the preferred imaging modality, enabling characterisation of the severity and extent of splenic injury. Ultrasound abdomen is an alternative for patients who are haemodynamically unstable (Hayman CV, Vyas D.,2021).

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GLUCOSE INTOLERANCE AFTER RADIOACTIVE IODINE TREATMENT IN GRAVES DISEASE PATIENTS

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ABSTRACT

Graves' disease is an autoimmune condition where a person's overactive thyroid produces an excessive amount of thyroid hormones, leading to hyperthyroidism. Today, this condition is treated with anti-thyroid drugs, surgery, or radioactive iodine treatment. Anti-thyroid drugs are often used in the United States initially after diagnosis of Graves' disease. Unfortunately, relapse rates are extremely high when anti-thyroid drugs are discontinued after long-term therapy. Upon relapse, some patients opt for surgery to remove the thyroid gland. Although this procedure is effective in eliminating hyperthyroidism, patients risk hypothyroidism and injury to the recurrent laryngeal nerves and/or parathyroid glands during surgery.

Keywords: Graves' disease, Radioactive iodine, Treatment, Glucose intolerance

Introduction: Glucose tolerance abnormalities have been commonly documented in patients with hyperthyroidism. Despite the incompletely understood mechanism, insulin resistance is suggested as an important pathophysiology causing these abnormalities. The insulin resistance state in hyperthyroidism is improved with treatment of the underlying disease, as evidenced by improvement of glucose tolerance following treatment of hyperthyroidism with oral antithyroid drugs, beta-blockade, and radioiodine therapy. Improvement of insulin resistance with the treatment of hyperthyroidism has also been documented by the improvement of glucose uptake by leg muscle in hyperthyroid patients following treatment with propranolol (Kurozumi et al., 2023). These glucose tolerance abnormalities might be caused by the direct effect of thyroid hormone excess on pancreatic beta cell function because it improves as the thyroid function becomes normal by antithyroid drug therapy (Stoynova et al. 2024., Deepthi et al. 2021., Song et al. 2021., Kim, 2021., Ross et al. 2022).

On the other hand, propranolol treatment for hyperthyroid patients can reverse the increased insulin resistance, and it also shows a positive effect on glucose tolerance, suggesting that the effect is mediated through adrenergic activation in Graves' disease (Huang et al. 2020). Then, when a Graves' disease patient treated with propranolol undergoes radioiodine therapy, it can be assumed that there will be a delay in the improvement of insulin resistance with the worsening of glucose tolerance. Considering that our previous report demonstrated the change in insulin secretion and insulin sensitivity in Graves' disease patients after treatment with PTU and radioiodine therapy, this study aims to find out the change in glucose tolerance and insulin resistance state after radioiodine therapy in Graves' disease patients (Eom et al., 2022., Hsieh, 2023., Sengupta et al. 2022).

Background on graves disease and radioactive iodine treatment: Graves' disease is an autoimmune condition where a person's overactive thyroid produces an excessive amount of thyroid hormones, leading to hyperthyroidism. Today, this condition is treated with anti-thyroid drugs, surgery, or radioactive iodine treatment. Anti-thyroid drugs are often used in the United States initially after diagnosis of Graves' disease. Unfortunately, relapse rates are extremely high (greater than 50%) when anti-thyroid drugs are discontinued after long-term therapy. Upon relapse, some patients opt for surgery to remove the thyroid gland (partial thyroidectomy or total thyroidectomy). Although this procedure is effective in eliminating hyperthyroidism, patients risk hypothyroidism and injury to the recurrent laryngeal nerves and/or parathyroid glands during surgery (Biondi, 2021.,Kim, 2022) .Radioactive iodine treatment has become increasingly popular in the United States as an alternative therapy for relapse after anti-thyroid drugs or for simple definitive treatment to hypothyroidism or surgery. In Europe, it has been the primary therapy for several decades. High-dose radioactive iodine therapy is simple, involves no surgery, and is very effective in achieving a permanent cure for hyperthyroidism. However, primary use of this therapy may result in new onset or worsening of pre-existing ophthalmopathy and it may lead to progression of the ophthalmopathy when added to patients already having active eye disease. (Shalaby et al.2022.,Daniels & Ross, 2023)

Glucose intolerance-definition and causes: Glucose intolerance is a state of the body resistant to insulin action or inability to produce enough insulin which leads to the inability of the body to metabolize glucose and carbohydrates. Glucose intolerance can occur due to a few conditions such as post-pancreatitis state, pregnant diabetes state, and stress-induced hyperglycemia. But the overall effect is the same, which is the inability to metabolize glucose and carbohydrates, leading to an increase in blood sugar levels. Stress hyperglycemia can occur after a patient undergoes severe stress such as injury, surgery, and infection. The increase in catecholamines and cortisol due to stress can cause an increase in hepatic glucose output and insulin resistance. Usually, blood sugar levels will rise 12 to 48 hours after the stress incident and can revert back to normal after a few days. The mechanism is the same with Graves' disease patients who develop glucose intolerance after radioiodine treatment. But stress hyperglycemia is a transient state of increased blood sugar and can be resolved after a few days, meanwhile, glucose intolerance in Graves' disease patients after radioiodine treatment is a permanent condition requiring treatment. Other mechanisms of stress-induced hyperglycemia include increasing peripheral lipolysis and insulin resistance, which leads to muscle wasting and weakness due to the inability of the muscles to utilize glucose (Trump, 2020.,Barnabei et al.2022.,Joshua et al.2022).

High blood sugar can cause osmotic symptoms such as polyuria and dehydration. This will worsen the muscle weakness and confine the patients to bed. It is a fact that patients who develop glucose intolerance post-radioiodine treatment will develop muscle weakness, and in severe cases, it can cause the patient to be bedridden. This is due to the effect of untreated high blood sugar causing a persistent state of insulin resistance and peripheral lipolysis (Luger & Böhm, 2022.,Yeung2021.,Haroon & Husnain, 2021).

The relationship between radioactive iodine treatment and glucose intolerance: With conflicting findings such as these, it is difficult to ascertain the true relationship between RAI and glucose intolerance. This is made even more difficult by the fact that most of the follow-up studies have had a short period of observation and have been confounded by the lack of selection of Graves' patients without concomitant diabetes risk factors (age, obesity, etc).Reports in the literature about the relationship between radioactive iodine treatment (RAI) and the likelihood of developing glucose intolerance, insulin insensitivity, and diabetes have provided conflicting findings. For example, in a paper by Singh et al., the cross-sectional, random sample study of two populations of similar age and sex, this being treatment with and without RAI, found no difference in the prevalence of diabetes or impaired glucose tolerance. A similar result was found in an uncontrolled study by Takata et al., although they concluded that RAI can cause a small increase

in the risk of insulin insensitivity late in life. Conversely, a prospective study by Topping et al. found that the level of C-peptide, a marker of insulin insensitivity, was significantly higher in an RAI treatment group than in control and untreated groups. Furthermore, the odds ratios showed that the relative risk of developing C-peptide values in the diabetic or impaired glucose tolerance range were respectively 7.6 and 3.7 times higher in RAI patients compared with control patients (Kim et al.2024.,Oh & Ahn, 2021.,Sparano et al.2022).

Conclusion and recommendations:The next essential question that arose after the aforementioned groundbreaking discovery centered around the intricate sequence of events which displayed a remarkably high prevalence of GIG (glucose intolerance) but surprisingly not IGM (impaired glucose metabolism). To delve deeper into this subject matter, a meticulously conducted study examining insulin secretion in individuals afflicted with diabetes employed the usage of C peptide, a potent marker of endogenous insulin production. Astonishingly, the findings revealed that patients diagnosed with type 2 diabetes mellitus (DM) exhibited significantly lower levels of C peptide compared to their counterparts suffering from type 1 DM, albeit not as dramatically low as the patients requiring regular insulin administration due to the severity of type 1 DM. This subtle yet crucial discrepancy between type 2 DM and type 1 DM sparked an extensive and ongoing debate within the scientific community, pondering the potential relationship between GIG in the elderly population and its plausible classification as an early phase of type 2 DM. It is important to note that type 2 DM is widely acknowledged as a multifaceted and heterogeneous disease, primarily characterized by insulin resistance as its main etiology (Shalaby, M., Hadedeya, D.,Toraih, E. A.,2022).The current study, while informative and illuminating, regrettably did not encompass a comprehensive exploration of insulin and glucose metabolism. However, it is of utmost urgency and significance that such an investigation is contemplated and executed in the subsequent study, for it holds the potential to yield invaluable insights into the prevention and therapeutic strategies when tackling GIG/IGM following radioactive iodine (RAI) treatment in patients afflicted with Graves' disease. (Rickels et al.2020.,Eizirik et al., 2020).Glucose intolerance after RAI treatment in Graves' disease is a consequence of the radiation effect on the pancreas. In this study, we had no data to prove the direct effect of RAI on the pancreas, but the findings were strongly supported by the exclusion of other etiologies of DM and the chronological relationship between RAI treatment and the onset of GIG/IGM. DM type 1 is an etiology of secondary DM which results from damage and destruction of β -cells of the pancreas. β -cells have slow turnover, so it takes a long time before the symptoms of DM occur after the initiation of damage. Similarly, the duration between RAI treatment and the onset of GIG/IGM in this study showed a wide range, from 6 months to more than 10 years (Stoynova, M., Lilova, L., Petrova, D.,2024).

On the other hand, subjects in the group given RAI treatment for more than 6 months had a significant difference in glucose tolerance compared to controls ($P < 0.05$) in the study. Furthermore, the prevalence of GIS was higher in the former group (36.8% vs 8.3%). In a previous control study, about 22% of the general population with age over 40 years had GIS. This means that the patients in the former group had a risk of about 2.5 times higher of GIS than the general population in the same age range (Sengupta, J., Das, H., Sasithra, S., & Britto, J. (2022). The group who had RAI treatment for less than 6 months showed the same profile as the control group. The last group, patients with ATDs only, had a lower prevalence of IGM when compared with the other groups, which was not significant. This finding was reasonable because this group had a lower proportion of female and older patients. Female gender and old age were patient characteristics that increased the risk of GIG and IGM. Our study also found that the duration of ATD administration was an independent risk factor for glucose intolerance. The longer the duration, the higher the prevalence of GIG and IGM. This was also supported by the fact that the patients with RAI treatment had a longer duration of thyrostatic therapy than those with ATDs only (47.8 ± 34.9 months vs 37.8 ± 24.8 months) (Buzzetti et al.2020.,Zhang et al.2020).

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**THE ANATOMY OF THE SEVEN DEADLY SINS: MEDIEVAL CLASSICS THAT
INSPIRED THE FILM SE7EN; THE DIVINE COMEDY, THE CANTERBURY
TALES AND PARADISE LOST**

**YEDİ ÖLÜMCÜL GÜNAHIN ANATOMİSİ: YEDİ FİLMİNİN ESİNLEDİĞİ ORTA
ÇAĞ KLASİKLERİ, İLAHİ KOMEDYA, CANTERBURY MASALLARI VE KAYIP
CENNET**

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Özet

Yönetmenliğini David Fincher tarafından yapılan *Yedi* (*Se7en*) filminin senaryosunu Andrew Kevin Walker yazmış, 1995 yılında gösterime girmiş ve başrollerinde Morgan Freeman, Brad Pitt ve Kevin Spacey yer almıştır. 1996 yılında “En İyi Kurgu” dalında Oscar ödülüne aday olmuştur. Hollywood yapımlı bir gerilim filmi olan *Yedi* filmi, karanlık mekanlarda çekilen sahneleri, küf rengi tonların ağırlığı ve sürekli yağmur yağan bir şehrin kasveti altında Hristiyanlık dininin “7 Ölümcül Günahı”nı işleyenleri kendi acımasız ve vahşi yöntemleriyle cezalandırıp, öldüren bir seri katili yakalamayan çalışan iki polis dedektifin mücadelesini konu alır. Seri katili yakalamaya çalışan dedektifler, cinayetler ve “7 Ölümcül Günah” arasında bir bağ kurarlar. Hristiyanlık inançlarına göre temel günahlar olarak tanımlanan; “kibir, açgözlülük, şehvet, öfke, haset, tembellik ve oburluk” olarak sınıflandırılan “7 Ölümcül Günah,” Papa I. Gregorius tarafından düzenlenir ve insanın hayatı boyunca sakınması gereken günahlar olarak kabul edilir. Filmde ise seri katil bu günahları işleyen insanları ceza olarak vahşice öldürmeye başlar, peş peşe devam eden cinayetlerinde Dante Alighieri, “İlahi Komedy,” Geoffery Chaucer, “Canterbury Masalları” ve John Milton, “Kayıp Cennet”in izleri vardır. Bu yüzden dedektifler bu eserleri okumaya başlarlar ve işlenen cinayetlerin anatomisini çıkarırlar. Orta Çağ’a yön vermiş klasik eserler ve *Yedi* filmiyle arasında “7 Ölümcül Günah” ilişkisi bağlamında metinlerarası ilişkiler kurulabilmiştir ve bu araştırma da kurulan ilişkiyi somutlaştırmak için filmde ve bahsi geçen eserlerden örnekler karşılıklı olarak değerlendirilecektir.

Anahtar Kelimeler: Orta Çağ Edebiyatı, Adli Bilimler, Metinlerarası Yaklaşımlar

Abstract

Directed by David Fincher and written by Andrew Kevin Walker, *Se7en* was released in 1995 and starred Morgan Freeman, Brad Pitt, and Kevin Spacey. It was nominated for the 1996 Academy Award for “Best Editing.” A Hollywood thriller featuring scenes shot in dark locations, musty tones, and the gloom of a city in constant rain, *Se7en* follows the struggle of

two police detectives to catch a serial killer who punishes and kills those who commit the “7 Deadly Sins” of the Christian religion in his own cruel and brutal way. The detectives on the trail of a serial killer make a connection between the murders and the “7 Deadly Sins.” Defined as the cardinal sins in Christian beliefs and classified as “pride, greed, wrath, envy, lust, gluttony, and sloth,” the “7 Deadly Sins” were set out by Pope Gregorius I and are regarded as sins to be avoided throughout one's life. The film portrays a serial killer who begins to brutally murder people who have committed these sins as punishment, and his successive murders are inspired by Dante Alighieri's “The Divine Comedy,” Geoffrey Chaucer's “The Canterbury Tales,” and John Milton's “Paradise Lost.” The detectives start perusing these literary works and meticulously analyze the homicides. Intertextual relations can be established between the classical works that shaped the Middle Ages and the film *Se7en* in the context of the “7 Deadly Sins,” and the present study aimed to mutually analyze examples from the film and the aforementioned works in order to concretize the established relationship.

Key Words: Medieval Literature, Forensic Sciences, Intertextual Approaches

**SELECTION OF OPERATIONAL CHARACTERISTICS OF TRUCKS ON THE ROADS
OF THE MOUNTAINOUS TERRAIN IN THE TRACECA SECTION OF GEORGIA**

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Abstract

In the conditions of globalization of trade and economic relations between countries, the implementation of cargo transportation is related to the use of all types of transport, that is intermodal transportation of cargo. At present, intermodal cargo transportation with uniform transport documentation and several means of transport is the most widespread form of long-distance and international transportation. In intermodal shipments, water-road-rail is the most common. As of today, cargo transportation by means of road transport is the most demanded.

It should be noted that the intensity of the traffic flow is gradually increasing in the „TRACECA“ section of Georgia due to its location and the current situation in the world. Because of this, the traction speed properties of heavy-duty vehicles are required not to impede the movement of traffic flows, and it is necessary to legislate the minimum permissible value of the specific power of trucks moving in traffic flows.

In the process of cargo transportation on mountainous terrain roads, for the highly efficient functioning of motor vehicles, it is necessary to use a motor vehicle with operating characteristics adapted to the working conditions. In particular, the compliance of the traction speed properties with the performance requirements in traffic flows under road conditions.

Traction-speed characteristics of a truck are determined by engine power and transmission gear ratios. Therefore, when selecting a truck for use in the given operational conditions, the first task is to analyze the power characteristics of its engine and transmission parameters - selection. The main power characteristic parameter of a truck is its power, which is the ratio of the maximum power of

its engine to the total weight. Power refers to the level of power equipment of the truck. Low-horsepower vehicles drive on uphill roads at low speeds with low transmission gears and high engine load modes, which increases road fuel consumption; At the same time, the movement of traffic flows is hindered and the safety of road traffic is compromised. All mentioned parameters improve when using high power vehicles. At the same time, we should note that increasing the specific power of the truck beyond the specified value may lead to a decrease in the efficiency of the truck if the increased value of the specific power is not fully realized in the given traffic conditions. Therefore, under the given road conditions, the rational value of the specific power of the truck should be considered the value that determines the maximum productivity of cargo transportation with minimum material costs. The article presents the rational values of the capacities of trucks on Georgian roads as a result of research.

Keywords: Traceca; truck; Traffic flows; Intervals; Transmission; Horsepower; Transportation.

INVOLVEMENT OF PARENTS IN CURRICULUM DEVELOPMENT IN GHANA

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Abstract

The involvement of parents in curriculum creation in Ghana is the key topic of this research. In line with the study, when creating structures and standards for curricular growth, a range of overlapping and competing agendas are at play. In the aforementioned study, 115 students, their guidance, and 27 instructors participated in a three-year longitudinal investigation. Information was gathered through surveys, school visits, and interviews. The findings show that curriculum-based materials and school curricula exist but are unseen. There was a clear disconnect between households, institutes, and public ethos. Parentages and educators stated attention to using reflection and curriculum development to incorporate history, now, and future times into the curriculum. Parents, students, and teachers all reported feeling more knowledgeable about curriculum creation, according to the survey. The report claims that instructors and Guidance want to collaborate to create a curriculum and school policy that is supported by a teacher who understands cultural differences. The abstract examines the possible advantages of parental involvement, such as better curricular relevance, higher student engagement, and stronger ties between the school and the community. It also discusses possible obstacles and hurdles to successful parental involvement, like time and many more conflicting expectations, and power imbalances in educational institutions. The abstract provides insights into promising methods and tactics for meaningful parental involvement in curriculum development through a synthesis of current research and real-world examples. The statement underscores the importance of adopting inclusive, transparent, and culturally sensitive practices that acknowledge the varied viewpoints and proficiencies that parents contribute. In the end, this abstract emphasizes how crucial it is to support collaborations between parents and teachers to develop curricula that represent the interests, values, and goals of all parties involved and advance educational excellence and equity.

Keywords: Curriculum, Development, Parents, and involvement

**DESIGNING THE MANAGEMENT OF CHRISTIAN RELIGIOUS EDUCATION IN
THE FAMILY**

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Abstract

Family has an important role in educating children to have good character and spirituality. However, not all families can provide proper education to their children due to the lack of education management design, especially Christian religious education in the family, lack of parents' awareness of their role to educate their children due to busyness. As a result, many families fail to implement Christian religious education in the family. As a result, children grow up with bad characters, like to fight, like to rebel, wild, and have free association. So the family lives in chaos, disharmony, and unhappiness. Parents need to be helped and made aware of the importance of providing religious education to their children at home from an early age. Designing Christian religious education management is designing the organization of Christian religious education in the family. The goal is to guide the generation to the development of future generations. The younger generation has spiritual discipline in Christian religious education. A good and bad generation depends on the good and bad experiences of the generation's life in the family, to save the young generation to have good character in social life, and to make it easier for parents to provide teaching. Because there is already material, time, and activities. This means that there is already an operational standard. So that children will grow up mature and right by getting two things from their families, first character education and second spiritual education. Based on the above background, the purpose of this study is to design the management of Christian religious education in the family. The method used in this research is a literature study. The result of this research is to produce a design for the management of Christian religious education in the family. So that it can help families to implement and realize the importance of providing Christian religious education in the family, so that children have good character and spirituality.

Keywords: Designing, Management, Christian Religious Education, in the Family.

**BEYOND THE FACADE: RECOGNIZING STROKE CHAMELEONS FOR EARLY
DIAGNOSIS AND OPTIMAL PATIENT CARE**

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Abstract

Annually, 15 million people worldwide suffer from stroke¹. The significant challenge lies in the misdiagnosis of stroke, leading to elevated mortality rates and the loss of disability-adjusted life-years, thereby posing a formidable obstacle in the realm of public health. Accurate and timely diagnosis is essential to facilitate prompt acute reperfusion treatments and implement effective strategies for secondary prevention.

This comprehensive review meticulously explores into the realm of stroke chameleons and mimics describing syndromes initially not recognized as strokes but later identified as acute stroke, which can manifest as dizziness/vertigo, monoplegia, altered mental status, hyperkinetic movement disorders, limb shaking, headache and nausea/vomiting². Identifying these symptoms is crucial, as missed diagnoses may lead to delayed treatment and increased disability.

Stroke chameleons with their atypical symptoms and unusual time pose a risk of underutilizing interventions like intravenous thrombolysis or mechanical thrombectomy. The phrase "stroke mimic" serves as a broad category rather than a specific diagnosis. It is employed when acute stroke has been ruled out, and a more plausible explanation is discovered for a clinical presentation initially thought to indicate acute ischemic stroke. Recognition of these diverse presentations requires heightened awareness and advanced imaging techniques, such as MRI, to distinguish central nervous system disorders accurately². It underscores the importance of education for both the general population and healthcare providers to enhance the identification of stroke chameleons and improve patient outcomes.

This diagnostic approach aligns with performance improvement tools like 'Get with the Guidelines' for better stroke care³. It recognizes subtle stroke presentations, addresses challenges in advanced imaging, and notes that neurologic consultations may not always prevent overlooked stroke diagnoses⁴.

In conclusion, this study emphasizes the challenges of diagnosing stroke chameleons, advocating for improved strategies and education to enhance identification. Future research should investigate system-related factors and explore effective educational approaches to address this diagnostic complexity.

Keywords: stroke chameleons, early diagnosis, atypical presentation, imaging techniques

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**THE IMPACT OF INCORPORATING TURMERIC ESSENTIAL OIL AND
POMEGRANATE PEEL POWDER ON THE NUTRITIONAL QUALITY OF
BROILER CHICKEN MEAT**

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Abstract

In response to the challenges faced by the poultry industry and the increasing demand for high-quality chicken meat, this study investigates the impact of incorporating turmeric essential oil and pomegranate peel powder into the diet of broiler chickens (ARBOR ACRES strain) on the nutritional quality of their meat and overall health. The experimentation took place at the MAZAGRAN breeding facility in the wilaya of MOSTAGANEM, with physico-chemical analyses of the meat conducted at the Applied Animal Physiology Laboratory.

The experimental design included one control group and two treatment groups, each group contained three replicates in which the broiler diets were enriched with the designated additives, namely turmeric essential oil and pomegranate peel powder.

The findings suggest that the use of these natural additives has no adverse effects on the nutritional quality of the meat. Specifically, a significant increase in crude protein levels was observed in the breast meat compared to the thigh meat for both experimental groups (turmeric oil and pomegranate peel), with respective values of 19.46 g and 20.26 g for the breast and 17.03 g and 17.1 g for the thigh. A notable influence was also observed on the lipid content (g/100g) of the meat from the group treated with turmeric oil (thighs 7.227 g vs breast 5.713 g) compared to the group treated with pomegranate peel powder, showing values of 2.853 for thighs compared to 4.44 for the breast. The TBARS index recorded its highest value in the breast meat from the group treated with turmeric oil, reaching 0.597 mg equivalent MDA/kg.

Keywords: broiler chicken, turmeric essential oil, pomegranate peel powder, meat nutritional quality.

**ECO-FRIENDLY TECHNOLOGIES: BRIDGING DISCIPLINES FOR
ENVIRONMENTAL INNOVATION**

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Abstract

This paper examines how environmental sustainability and technology interact. The pressing need to solve environmental issues in the modern world necessitates creative ideas that go beyond academic boundaries. This study integrates knowledge from the social sciences, engineering, biology, and chemistry to examine how environmentally friendly technology promote sustainable development. In order to achieve concrete environmental benefits like lower carbon emissions, preservation of natural resources, and pollution mitigation, this paper explores the wide range of eco-friendly technologies, such as renewable energy systems, green building materials, waste management solutions, and sustainable agriculture practices. It also emphasises how interdisciplinary collaboration promotes the development and implementation of these technologies.

Additionally, this paper highlights the value of interdisciplinary research and education in developing a comprehensive understanding of environmental issues and in developing innovative problem-solving abilities. It also highlights the role that policymakers, industry, and academia play in creating an environment that is favourable to the adoption and expansion of environmentally friendly technologies. Lastly, this paper offers insights into the critical role that environmentally friendly technologies play in addressing environmental challenges and emphasises the importance of interdisciplinary collaboration in fostering environmental innovation.

Keywords: Environment, sustainability, interdisciplinary, eco-friendly

UNDERSTANDING ORGANIZATION IN PUBLIC ADMINISTRATION

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Abstract

Since our recruitment at the university and since our mission and responsibility within the university, we have had a particular interest in public administration work in the public sector.

After experience, we found that it is not easy and it is not difficult to work within a public administration through understanding the environment for each responsibility.

Studying one's environment represents an essential condition for being able to think about an administrative organization through the activity of the administration which involves an organic aspect and a materiel aspect.

Thinking about the organization of the administration requires ignoring any mission or means that brings positivity within this administration from an organic and materiel point of view.

Our presentation is mainly interested in taking into consideration a thought about the organization of the administration in relation to the missions entrusted to the various public agents, to the regulatory and legislative texts, to the resources made available for the realization of the objectives and projects as well as coordination between the various internal and external services and the various control bodies.

Keywords: university, public administrationn, organization, public services, control actor.

**AFFECTIVE FILTERS TO ENHANCE ENGLISH FOR SPECIFIC PURPOSE (ESP)
LEARNERS' COMMUNICATIVE AND INTERCULTURAL SKILLS**

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Abstract

Learners in Benin often encounter difficulties in language learning due to their diverse linguistic backgrounds, leading to anxiety and diminished motivation. This study aims to explore the significance of affective and practical strategies that can enhance the existing curriculum without necessitating immediate modifications. This research carried out using a mixed method, involved 40 secretarial studies ESP learners of Lycée technique professionnelle de Porto-Novo, split into two groups of 20. The experimental group engaged in specially designed activities to boost motivation, alleviate anxiety, and enhance intercultural communication skills, unlike the control group. The outcomes reveal that the experimental group exhibited increased motivation, reduced anxiety, and improved intercultural communication skills compared to the control group. These findings underscore the importance of integrating Affective Filters into language teaching programs for plurilingual learners.

Keywords: ESP, Affective Filters, Communicative Skills, Intercultural Competence.

CURRENT INTERNET CACHING VERSUS NDN CACHING

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Abstract

The Internet records more than 2.4 billion connected devices mainly utilized for the distribution and retrieval of the content resulting gigantic exchanges on the Internet network. The demands are raising for User Generated Content (UGC) and high-definition video on demand (VoD) traffic, for instance, Netflix, Dailymotion, and Youtube. In the next few years, the current Internet architecture will be unable to handle this enormous traffic. Many solutions were proposed to solve these Internet issues. However, these solutions raise the Internet architecture complexity and numerous needs cannot solve them properly. The gap between the original Internet design and its current utilization is rising due to continued application growth and exponential increase of content distribution traffic. Several researchers are convinced that it is not possible to resolve Internet problems by using today's Internet design. The Internet limitations and current in-network caching solutions; for instance Content Delivery Network (CDN) and Peer to Peer network (P2P); encourage researchers to think about new alternatives for the future Internet. Consequently, the future Internet architecture is currently a very active research subject. Today's Internet utilization based on content dissemination was the fundamental motivation for moving from the current host-centric communication mechanism to a content-centric communication mechanism. Several research communities have suggested Information Centric Networking design as alternative for greater control. The Information Content Networking (ICN) design was suggested to address the current Internet's drawbacks. The Information Centric Networking design support natively in-network caching and it is major straight element of this suggested design. They were many architectures suggestions for the ICN design however the Named Data Networking architecture (NDN) is the most promising architecture among all them. The in-network caching is a core feature of the NDN design and it supports naturally in-network caching. The NDN in-network caching is possible due to router-caches that are equipped with cache storage to store a copy of the disseminated data packet in their local content store. The stored contents are utilized to satisfy potential requests which will enhance remarkably the network performance, optimize the network resources use and alleviating the burden on the original servers.

Keywords: ICN, NDN, P2P, CDN, Internet, in-network caching, future Internet design.

FETAL GROWTH RESTRICTION AS A PREDICTOR OF HEALTH THROUGHOUT FUTURE LIFE

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Introduction

Fetal growth restriction remains an important problem in obstetrics and neonatology due to high rates of perinatal morbidity and mortality. A narrative review of the literature provides information about a new paradigm in modern perinatology - the concept of “placental” or “major obstetric syndromes”, which include fetal growth restriction. The tragic experience of the impact of hunger in wartime on the intrauterine development of the fetus and morbidity in adulthood is analyzed. An idea of the development of the concept of the “thrifty phenotype” as an adaptation process is given. Concepts about possible mechanisms of intrauterine programming are discussed. Provides information about the concept of the First 1000 Days (from conception to two years after birth) and developmental plasticity, which are important for long-term health.

An analysis of the literature showed that newborns with fetal growth restriction are at high risk of diseases in the postnatal period. A history of this diagnosis is a risk factor for the development of chronic non-communicable diseases during adulthood (arterial hypertension, insulin resistance, type 2 diabetes mellitus, abdominal obesity, dyslipidemia, chronic kidney disease). The risk of diseases of the bronchopulmonary system, brain damage, and disturbances in psychosocial adaptation increases. There is an adverse effect of fetal growth retardation on the reproductive system of men in the future, in particular, infertility.

Proposals for preventive measures aimed at reducing chronic diseases in patients with a history of growth retardation are analyzed.

Conclusion

Fetal growth restriction plays a key role in increasing the risk of immediate and long-term health consequences, which requires further research and the development of preventive and therapeutic measures.

Key Words: fetal, health, obstetric, growth

**NAVIGATING DIVERSITY: OPINIONS ON SAME-SEX MARRIAGE IN
BUJUMBURA, BURUNDI**

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Abstract

This study delves into the opinions of Africans on same-sex marriage, focusing on the case of Bujumbura, the capital of Burundi. The exploration of attitudes toward same-sex marriage in African societies, often influenced by cultural, religious, and societal factors, remains a complex and nuanced subject. In Bujumbura, where traditional values intersect with modern perspectives, this research employs a qualitative approach to gather and analyze opinions on same-sex marriage. The study aims to provide an in-depth understanding of the factors shaping public sentiment and discern any emerging patterns within the cultural context of Bujumbura. The findings reveal a diverse range of perspectives, highlighting the intricate interplay between cultural norms, religious beliefs, and evolving societal attitudes. To foster greater inclusivity and understanding, it is recommended that community engagement initiatives be developed, encouraging open dialogues that consider diverse viewpoints. Moreover, educational programs focusing on LGBTQ+ issues could play a crucial role in dispelling myths and misconceptions, fostering empathy, and promoting acceptance. Policymakers are encouraged to consider these insights when shaping laws and regulations, ensuring they reflect the evolving societal attitudes and promote human rights. This research contributes to the ongoing discourse on LGBTQ+ rights in African societies and aims to foster a nuanced understanding of the complexities surrounding same-sex marriage in the specific context of Bujumbura, Burundi.

Keywords: Same-sex marriage, LGBTQ+ rights, African perspectives, Bujumbura, Cultural attitudes, Qualitative research.

**PERCEPTIONS OF STUDENTS ON GENDER: A FEMINIST CRITICAL DISCOURSE
ANALYSIS OF SECOND LANGUAGE CLASSROOM IN PAKISTAN**

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The debate on males and females' roles and equilibrium in the sociocultural context has been in focus since the inception of the feminist theories. The students carry the concomitant social practices in the classroom, and later on, such discursive practices converge to the dominant practices. The current study focuses on the ESL Pashtoon classrooms in order to find out how the male and female students perceive during the interactions and discourses collectively generated by the classroom participants. Hence, this study tries to contribute to gender representation in the ESL Pashtoon classroom. A total of thirty participants were selected through convenience sampling and data were collected through questionnaires in form of frequencies as to how the students perceive. During the collection of data all ethical principles were taken into consideration. The data were analyzed using Baxter's (2002) Feminist Post-structural Discourse Analysis henceforth FPDA. The analysis of the data revealed that treatments of girls in ESL Pashtoon classroom is quite different from their counterparts. A parochial mindset exists in the classroom practices where the girls have to collaborate with their male counterparts. However, the presence of females in the classroom is accepted by the social actors present in the ESL classrooms for a better positive face of society. For girls' education, it seemed quiet hard in such societies; however, the research shows quite encouraging results girls' education. Due to less interaction of girls in social settings they damage their confidence level and valuable talks. Thus, it is incumbent upon the state machineries to focus more on such matters for even better result and social change.

Keywords: ESL classroom, Gender representation, Class room discourse.

**POSITIVE AND NEGATIVE INNOVATIONS ON AI ECONOMIC PERSPECTIVES
IN MODERN BANKING/FINANCE**

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Abstract

It sum up the significant discoveries of exact examinations that look at the impact of banking advancement on development and feature their general commitments to comprehension of the different jobs the financial area plays in deciding development. It rethinks the impact of banking improvement and advancement, stretching out the extent of examination to more grind elements of development and to Asia markets where monetary business sectors are least evolved. It additionally observes that while hypothetical ramifications are for the most part endless with regards with the impact of banking advancement on development, exact discoveries are less uncertain given their particular focal point of test firms and the fundamental channels researched. The improvement states of monetary business sectors likewise matter in drawing suggestions for the impact of monetary foundations on advancement.

Banking sectors are also use the Artificial intelligence system for economic perspectives in modern finance. Artificial intelligence (AI) systems are machine-based systems with varying levels of autonomy that can, for a given set of human-defined objectives, make predictions, recommendations or decisions. AI techniques are increasingly using massive amounts of alternative data sources and data analytics referred to as 'big data'. Although it is difficult to ignore the theoretical implications of bank progress on advances, exploratory disclosures tend to be less ambiguous because test businesses and secret channels are undeniably similar. This allows these regions' authorities to manage the credit market's importance while supporting the monetary region's progress. There is a greater level of reliability and speed in the banking process than before. There is now a much faster and easier way to maintain and retrieve documents and records. The core banking system is also improved by computerized banking. According to the study, monetary area liberation is associated with financial progress through improvement. This study demonstrates that intranational and highway financial liberties do not have consistent positive impacts on corporate growth. In particular, international financial liberties stifle growth while highway liberties accelerate it. There have been different financial development consequences associated with the two types of liberation. As a result of increased business dominance, bankers with lower business strength are less willing to lend to innovative companies, whereas banks with decreased market strength are more likely to provide development financing. As a result, different types of monetary freedoms may have different effects on the actual economy and on company development.

In particular, when the securities exchange is somewhat less evolved, as in most Asia markets, banks assume a huge part in supporting and advancing development. Subsequently, it appears to be conceivable for strategy producers in these locales to reinforce the advancement of the financial area and to work on the profundity of the credit market. The significant discoveries of the observational examinations that inspect the impact of banking advancement on development and feature their overall commitments to comprehension about the different jobs that the financial area plays in deciding advancement. Then, at that point, it will reconsider the impact of banking advancement and development.

Keywords: Positive and negative innovations, banking business, financial development, modern banking advancement.

**CLOUD SEEDING PERFORMANCE ON FLOOD CONTROL AND DISASTER
MANAGEMENT: CASE STUDIES ON DIFFERENT EVENTS**

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ABSTRACT

Weather modification by humans involves altering cloud development to enhance precipitation for the benefit of local communities. A persistent challenge has been accurately measuring the effectiveness of cloud seeding. This research investigates that performance of cloud seeding to prevent flash flooding for same province at different years: Jakarta, Indonesia, on January 27, 2013 and Jakarta, Indonesia, January 3, 2020. The purpose of that seedings is to mitigate the risks of flooding and alleviate water-related issues that often plague the capital during the rainy season over Jakarta and other flood-prone areas. For the first case; this initiative gained national attention due to assertions by the Indonesian government that it successfully reduced the rainfall in Jakarta, notably during January 26-29, a period when local meteorologists had anticipated heavier precipitation and potential flooding. At second case, BPPT which is an Indonesian government research institute in collaboration with the Indonesian Air Force, conducted three cloud seeding operations to break up clouds before they reach Jakarta. This study aims to provide insight for the implications of the cloud seeding technologies for the further flood events. These two applications have shown that, when evaluated according to the data obtained from cloud seeding meteorological forecasts, although this did not completely eliminate the floods in the Jakarta province, it had a positive effect on reducing the excess precipitation in this region.

Keywords: Cloud Seeding; Flash Flood, Excessive Rainfall

CULTURAL FOUNDATIONS OF ORGANISATIONAL FAVOURITISM

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Abstract

The concept of favoritism is derived from the Latin term "nepot," meaning favoritism toward relatives, particularly "nephew" (Barnhart, 1999). Today, favoritism is defined as the employment of relatives or acquaintances/close associates within the same organization (Basterretxea et al., 2019). Cronyism, a specific form of favoritism, likely originates from the term "crony," meaning a very close friend or colleague (Crowther, 1998). Over time, as family businesses institutionalize and increasingly employ individuals not related by blood in managerial positions, the impact of favoritism has begun to diminish. However, in public organizations, favoritism, particularly in the form of cronyism, has been on the rise. When examining social structures where organizational favoritism is prevalent, factors such as the country's education level, income disparity among social groups, the form of governance, and political perspectives play a significant role. Additionally, the dominant cultural values of a society provide fertile ground for the development of this practice. Currently, some global organizations provide statistical data on documented cases of favoritism and corruption across various countries. This data indicates a significant increase in favoritism and corruption, particularly in feudal or authoritarian regimes. The appointment of relatives, acquaintances, or family members to positions in politics and business, while generally frowned upon, is a widespread phenomenon (Merica, Borger, & Klein, 2017). In the context of the use or distribution of public resources, there is evidence that public administrators often prioritize allocating resources to known individuals for various reasons (ideological, religious, ethnic, regional ties). This issue is also prevalent in developing countries. In public organizations where favoritism is rampant, accountability is almost non-existent, often leading to the exercise of powers without legal basis. This study examines the cultural foundations of the development of favoritism in public organizations.

Keywords: Favoritism, Cronyism, Nepotism

DIGITAL CIRCULAR SUPPLY CHAIN MANAGEMENT

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Abstract

In the contemporary era of global commerce, the concept of the Circular Economy (CE) has gained significant traction as a sustainable alternative to traditional linear models of production and consumption. Within this paradigm, Digital Circular Supply Chain Management (DCSCM) emerges as a critical approach to optimize resource utilization, minimize waste generation, and foster environmental sustainability while maintaining economic viability.

DCSCM integrates digital technologies, such as cloud computing, blockchain, Internet of Things, big data analytics, and artificial intelligence, with the principles of CE to revolutionize supply chain (SC) operations. Through real-time monitoring, tracking, and data analysis, DCSCM enables enhanced visibility and transparency, facilitating efficient resource allocation, inventory management, and product lifecycle tracking. It also ensures data integrity, security, and traceability, thereby mitigating risks associated with counterfeit products and unethical practices.

The potential applications of DCSCM span diverse sectors and enable innovative business models, such as product-as-a-service and sharing economy platforms, which promote resource efficiency and circularity.

Despite its promises, implementing DCSCM poses several challenges, including technological complexities, interoperability issues, and organizational resistance to change. Additionally, regulatory frameworks and standardization efforts are required to address legal and compliance considerations. Moreover, fostering collaboration and cooperation among stakeholders across the SC ecosystem is essential.

By harnessing the power of digital technologies and embracing circular principles, organizations can drive efficiencies, reduce environmental footprints, and create long-term value for stakeholders. However, addressing technical, regulatory, and organizational challenges remains imperative to realize the full potential of DCSCM in driving systemic change towards a more sustainable future.

The aim of the article is to indicate the most appropriate technologies in the SCM system for smooth flows and obtaining the best results for CE strategy implementation. Also, the challenges and barriers to implementation of the DCSCM strategy together with innovative business models enabled by DCSCM will be discussed.

Keywords: Circular Supply Chain, Digital Technologies, Digital Supply Chain

MODULAR BUILDINGS MONITORING AND STRUCTURAL RESILIANCE

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Abstract

In this research paper it is reviewed the issues of technical diagnostics, monitoring, construction and operation of the modular buildings in Georgia and neighboring countries. Two types of monitoring can be distinguished, the first of which is aimed at the realization of operational tasks, and the second - at the phase of development. In other words, some monitoring systems will be completed a specific task, while others may exist indefinitely.

Monitoring during construction and operation is crucial for rapidly constructed modular buildings, enabling the detection and control of problems such as:

- Bending values of horizontal load-bearing structures as a result of the effects of permanent and temporary loads;
- Horizontal displacements in supporting structures, determining the direction of displacement;
- Displacements in deformation (temperature) seams with parallel measurement of temperature;
- Determination of the main compressive and tensile stresses in the sections of the supporting structures of any type of frame buildings;
- Determination of deviations from the vertical or design data of beam, diaphragms, supporting wall constructions;

Control of the geotechnical condition of the foundations:

- Ground water level measurement;
- vertical and horizontal displacements of the ground with the possibility of layer differentiation;

For carrying out such observations, modern types of transmitters are used, such as: strain gauges, linear and angular displacement sensors, motion sensors, displacement sensors, vertical ground displacement sensors, pressure sensors. All received data is integrated into the computer system.

Keywords: sensors, strain gauges, modular building.

Introduction

To design the monitoring system, we have to select location, number and type of sensors which allow to gather data during the construction and operational period of the modular building.

Data connection could be managed after the sensors are installed, the frequency of measurement is determined by the variables being measured and the intended use of the data. Less frequent data acquisition can be specified after the building construction process is completed.

Collected data could identify load-bearing structures, geometric dimensions, material properties, loads, foundation settlement, geotechnical deviations.

Relatively old data on previously conducted visual and instrumental studies could be used as a reference data.

The data logger can communicate over a local network or dedicated internet connection, transmitted wirelessly or could be downloaded to the laptop manually.

Regular maintenance of the sensors is required to ensure that the data is recorded and it is reliable. All external sensors and wiring should be inspected periodically to check for damages or failure and replacement if it is necessary. Embedded sensors can not be inspected and thus some redundancy is designed in data collection system. A system is required to ensure that data is reviewed regularly and any unexpected anomalies in the data are noted and investigated. Depending on the nature of the data and type of the sensors, some processing of the raw data is required to filter the data to remove unwanted side effects that is not required for the purposes of data collection. Filtering the raw data makes the post processing and interpretation phase of the process more efficient and easier. Examples of filtering data include modifying data for thermal effects or removing data where sensors have recorded data outside of their allowable range. In addition to a maintenance of monitoring system it is also important to note events that occur during the construction phase so that they can be related to the raw data during the post processing phase (concrete pours, removal of props, application of finishes, application of cladding)

Data Management

Adequate memory must be provided for storage of both the raw data and processed data. The raw data is stored on a dedicated server with protected access. The location, type and reference for all sensors must be documented clearly to allow for future interpretation of the data. It is envisaged that the data will be stored for many years and will be available for students and professionals for teaching and research applications. MySQL database will be used to store long term data from the sensors and the database is accessible remotely via web using MySQL Workbench.

Arguably, the most important component of a monitoring strategy is the post processing of the raw data recorded from the sensors. The purpose of the post processing is to convert the raw data into useful information about the behaviors of structure when subject to various external effects during the construction and operational phase of the modular building. The ultimate goal is to provide reliable information on the behavior of the building which can be calibrated against numerical models and compared with predicted behavior in codes.

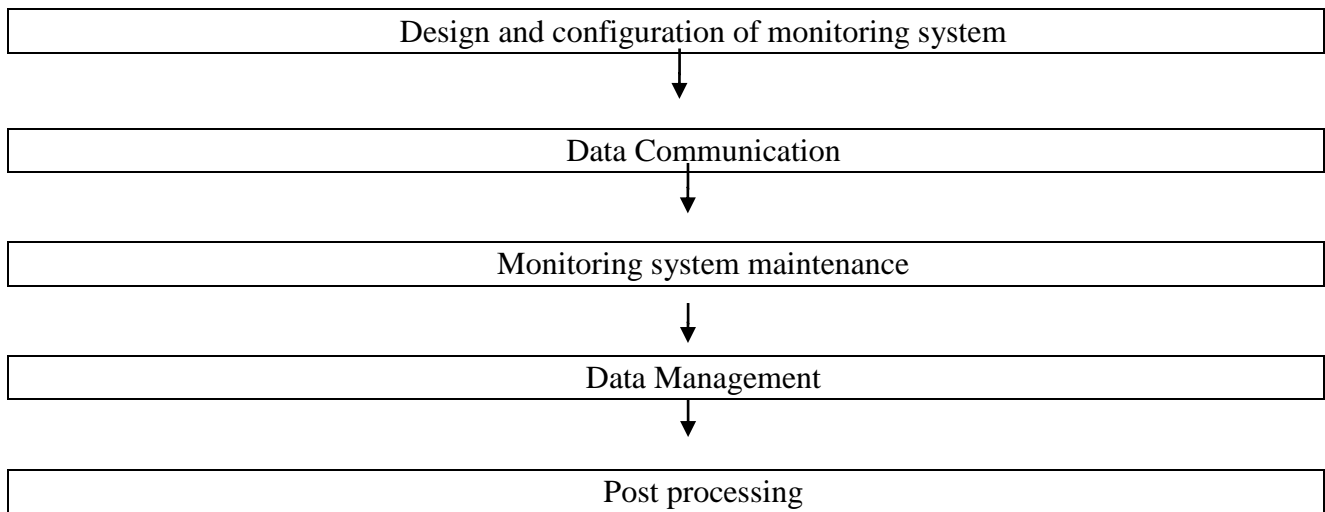
Sensors

Vibrating wire gauges could be embedded in concrete and will measure strain and temperature.

Electrical resistance strain gauges could be embedded and bonded to steel reinforcement in concrete, which measure uniaxial strain.

Thermistor sensors could measure concrete temperature.

Figure 1. Monitoring schematic design



Hybrid Modular Construction

For the hybrid modular construction it is possible to use precastes floor slabs and insitu concrete columns and beams. Strain gage and thermistore sensors could be embeded in recast and insitu construction elements.

The prediction of strains for concrete elements system is extremely difficulte to calculate accurately. The behavior of a slab at a service loadsvaries with time and depends on extent of cracking , stiffness of the slab andshrinkage and degree of restrain.

Data could be collected duringcuring, delivery and erection on siteso that strain and temperature history of the precast and insitu concrete elements could be analysed during the life cycle from production to operation of the building.

Development of Finite element

Finite element analysis (FEA) is based on the use of software tools that perform . FEA software allows the calculation of various types of building structures (columns, slabs, foundations, etc.) using different material models that simulate the numerical behavior of concrete, steel, soil and other materials. The following software tools are widely used in the field of construction:

ANSYS;

SAP2000 (<http://www.csiberkelev.com/sap2000>);

Autodesk Robot Structural Analysis (<http://usa.autodesk.com/robotstructural-analvsis-professional/>);

SCAD (<http://www.scadsoft.com/>)

Lira (<http://lira.com.ua/>)

These software tools are used for a wide range of calculation tasks of building structures:

1. Static analysis.
2. Dynamic analysis.
 - 2.1. modal analysis;

- 2.2. Effects of dynamic load
- 2.3. dynamic load exposure, given as a spectrum;
- 2.4. Effects of free dynamic load
3. Structural stability analysis

the software has several user interfaces:

1. Graphical user interface (GUI).
2. Command line interface (command line interface - CUI).
3. Application programming interface (application programming interface - API).

Command line and application programming interfaces are used for automatic interaction. ANSYS is selected to solve the tasks of this paper. Commands are automatically executed in batch mode. The command line interface involves the execution of commands written in the APDL language (ANSYS parametric design language)

The use of finite element modeling in complex monitoring technology allows automated calculations of building structures.

Monitoring sensors classification

The main principle of diagnosis includes sequential and systematic measurements of determined parameters and detection of changes in these parameters compared to the baseline.

Technical methods of diagnosis can be grouped into three stages:

- a) semi-qualified when any parameter is fixed. For example, temperature, pressure, general vibration, displacement, etc.
- b) qualified-vibration frequency analysis, continuous registration of operating characteristics, visual inspection, use of deformation transducer.
- c) high accuracy- analysis of models, use of ultrasonic defectoscopy, magnetography, holography, acoustic emission.

According to the parameters to be measured, diagnostic methods can be divided into three groups:

Primary method. These methods determine the main operating parameters. For example, the design of a track is intended to carry some specified load, and inspection is the primary method of diagnosis.

Secondary method. These methods measure the parameters that characterize the secondary effect compared to the main purpose of the construction. For example, the action of loads in the cross-sections of structures induces stresses and causes bending. Therefore, controlling stresses and deflections in them through acoustic emission, strain gauges and deflection gauges is a secondary method.

Tertiary method. These methods control the cause and effect of defects. For example, inspecting and controlling crack defects caused by increased stresses and strains in structures.

Let's review an example where we will classify rail diagnostics and integrity control methods, which is schematically shown in fig. 2. It seems that the reason for the loss of structural integrity in most cases is overloading, which can be caused by environmental conditions, as well as improper design and manufacturing.

The cause of break can be a change in the strength properties of the material, as well as a reduction of the loaded surface area caused by defects and crack growth.

Therefore, the diagnosis of constructions through the control of external loads (primary methods) will not always be effective. It fails to account for the risks of failure that are expected due to crack opening, creep of the material, and the presence of internal defects.

When diagnosing damage to structures, it is more effective to use secondary and tertiary methods, since they take into account the control of such parameters (result and sign stress, deformation, defect size), which are of decisive importance in the mechanism of failure.

When choosing the appropriate method of diagnosis, it is necessary to use methods that will notify us of the danger as early as possible, and then, as the damage increases, other methods should be used.

These methods are characterized by different sensitivity (efficiency) during construction operation. For example, at the beginning of the operation of the structures, until the defects of sufficient size are collected, it would be more effective to use the methods of controlling loads, stresses and displacements, as well as periodically conducting a visual inspection of the defects.

Conclusion

Development of a 3D reporting model of the modular building using the finite element method and determination of the most critical sections of the construction.

Selection optimal number of sensors and their location.

Development of the working documentation of the monitoring system project and its installation on constructions.

Real time monitoring offers potential benefits by understanding the actual behavior of the modular building construction elements in use and the possibility to develop and calibrate mathematical models that predict structural performance. The information from the real time monitoring also offers the opportunity to compare actual behavior with predicted behavior using codes of practice.

With the rapid development in wireless and sensor technology the use of this method to monitor modular building structural performance would be very fruitful in the phase of design, construction and building management

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- buildings

REMOTE LAB EXPERIMENTS IN MECHANIC: SIMPLE PENDULUM

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Abstract

In the teaching of experimental sciences, practical work plays a crucial role since it allows learners to transfer the knowledge acquired in theoretical courses into practical skills. For this purpose, laboratories allow learning by experience and aim at involving students, which reinforces learning receptivity. Recent years have seen an increasing use of online labs, including both virtual and remote labs, Remote labs, providing online interfaces to physical labs, allow students to conduct experiments with real-world equipment anywhere and at any time. This paper proposes a model of design,

development and implementation of a remote manipulation in an E-Lab. It is the simple pendulum which is part of the handling offered to the students of the 1st year of university in the field of physical sciences. The aim of this paper is to make this approach available to allow more experiments on a digital platform in order to allow learning for all, independently of time and place.

Keywords: Simple pendulum, E-lab, platform, experiments, remote labs, physics, E-learning.

EXPERIMENTAL STUDY OF THE CENTRIFUGAL PUMP IMPELLER WITH GAP DRAINAGE

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Abstract

Pumps are a key machinery group widely used in industry, second only to electric motors in their applications. They account for a significant portion of Europe's electrical power consumption, estimated at around 22%. In Poland, pumps consume approximately 32 TWh annually, equivalent to 20% of yearly production. According to EU Directive No. 2018/2002 of December 11, 2018, it is necessary to reduce the energy consumption of electrical appliances by 32.5% by 2030. Therefore, reducing energy usage during pumping processes is crucial. This can be achieved by selecting suitable new pumps and adjusting them properly or by enhancing existing units. Matching pump performance curves to specific system requirements and operating points is essential.

Centrifugal pumps are the most prevalent type among rotodynamic pumps, designed for flow rates exceeding 10 m³/h and specific speeds above 15 ($n_q > 15$). However, designing efficient centrifugal impellers with low specific speed is challenging due to efficiency loss caused by increased rotating disc friction losses and volumetric losses.

Study of literature suggests that efficiency in centrifugal pumps with ultra-low specific speed ($n_q < 15$) can potentially be improved by incorporating gap drainage into the impeller blades. When designing a centrifugal pump, it's crucial to consider not only efficiency but also pump reliability, aligning with EU directives and Energy Efficiency Index (EEI) and Minimum Efficiency Index (MEI) standards.

The research is focused on investigating how incorporating gap drainage in the impeller blades influences the energy characteristics of a single-stage centrifugal pump. To conduct this experiment, a base impeller with a low specific speed ($n_q \sim 13$) was designed along with modified versions. These modifications included implementing various gap drainage positions along the length of the blade, including on both the passive (suction) and active (pressure) sides. This setup enables the examination of how these modifications affect the pump's energy performance. Comparing the $\eta=f(Q)$ curves of the base impeller (without gap drainage) with the modified versions reveals that using slots generally improves the efficiency of the tested pump unit.

Keywords: centrifugal pump, low specific speed, centrifugal pumps impeller with a gap drainage

**CLASSES OF CYCLE RELATED GRAPHS WITH CONSTANT EDGE METRIC
DIMENSION**

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Abstract

Graph theory is a powerful tool for understanding the structural intricacies of various systems, and in this paper, we delve into the complex dimensions of this mathematical domain. Specifically, our exploration centers around the concept of edge metric dimension within connected graphs, aiming to unravel its complexities and implications. Let $G(V(G), E(G))$ be any connected graph and we have m, n belongs to $V(G)$ $d(m, n) = \min \{ \text{length of } m _ n \text{ path} \}$ and for e belongs to $E(G)$, $d(\mu, e) = d(e, \mu) = \min \{d(\mu, m), d(\mu, n)\}$, where $e = m _ n$, and μ belongs to $V(G)$. A vertex μ will distinguish between edge e and other edge e^* , if we have $d(e, \mu)$ not equal to $d(e^*, \mu)$. Suppose that $W_E = \{w_1, w_2, \dots, w_p\}$ to be a set (ordered) in $V(G)$ and say e is in $E(G)$. The characterization $r(e|W_E)$ of e with respect to W_E is p -tuple $(d(e, w_1), d(e, w_2), \dots, d(e, w_p))$. If unique edges in G are uniquely characterized in relation to W_E , in that case, W_E is referred to as the edge metric generator for G . A minimum cardinality of the edge metric generator is named as edge metric basis for G , and its cardinality is known as the edge metric dimension of G , often represented as $\text{edim}(G)$. In this particular paper, we explain about edge metric dimensions of uni-cyclic graphs $C_{m,j,n}$ and $C_{m,n}$ edge metric dimensions as 2 and 3 respectively, bi-cyclic graphs C_j and $C_{m,n}$ which also have edge metric dimensions as 2 and 3 respectively. Moreover, we calculate the edge metric dimension of two total graph of path graph, two-middle path graph and triangular ladder T_j which have edge metric dimension of 4.

Keywords: Edge metric dimension, Uni-cyclic graphs, bi-cyclic graphs, two total graph of path graph, two-middle path graph, triangular ladder graph.

**MAPPING URBAN TRANSFORMATIONS: ADVANCED REGIONALIZATION,
EMERGING CENTRALITIES, AND DATA TECHNOLOGY PERSPECTIVES**

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Abstract

This study explores the complex interactions that arise between sophisticated regionalization techniques, the creation of new centers, and the revolutionary effects of emerging technologies -especially data science- on urban environments. It aims to provide a thorough understanding of how these interconnected processes influence modern paradigms of urban development and governance. The study intends to clarify the intricate mechanisms underpinning urban transformation through a multidisciplinary approach combining urban geography, economics, and data science approaches.

In this perspective, the research covers the various facets of advanced regionalization, the growing number of centralities, and its impact of new technologies on urban planning within this framework. Technological integration, evolving demographics, economic dynamics, social cohesiveness, historical legacy, political empowerment, and rising regionalization trends are some of these characteristics. The study also evaluates the effects of emerging technologies, in particular data science, on important urban issues like smart cities, pollution, vulnerable populations, urban inequalities, transportation and mobility, housing and real estate, health and wellbeing, and urban economies.

This research project uses a multimodal approach as its methodology. First, a comprehensive analysis of scholarly works offers theoretical perspectives and develops a conceptual framework for comprehending the intricacies of urban change. Secondly, the utilization of data technology in empirical analysis allows for a more profound investigation of patterns of regionalization and the establishment of centralities. In order to determine the dynamics and drivers of the emergence of centralities, this study integrates statistical modeling, data visualization, and geospatial data analysis to analyze the spatial distribution of important urban indicators, including infrastructure development, population density, and economic activity.

The goal of this investigation is to offer important insights into the mechanisms via which increased regionalization impacts the establishment of centralities and alters urban landscapes through the use of a combined methodological approach. In a period of fast urbanization and technological growth, this study aims to inform more sustainable and effective approaches to urban planning and development by utilizing data technology and interdisciplinary viewpoints.

Keywords: Advanced regionalization, Emerging centralities, Urban geography, Data technology, Spatial analysis, Urban development, Sustainability.

**DETERMINING THE DEGREE OF WATER, SEDIMENT AND SOIL POLLUTION
IN BISTRICA OF KOSOVO, THROUGH THE ICP-OES METHOD**

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ABSTRACT

The present paper investigates the overall environmental quality of the Bistrica river in terms of heavy metal pollution and describes a procedure for the statistical patterns of heavy metals in water, sediment and soil samples so and the spatial diversity of health vulnerability. Analyzing its environmental status by laboratory measurements of physico-chemical parameters and heavy metal concentrations using the ICP-OES method. Samples taken in October 2023 at three locations showed high dissolved oxygen, neutral pH, and appropriate temperatures; nevertheless, higher biochemical oxygen demand suggested pollution. Heavy metal concentrations (Fe, Pb, Ni, Mn, Cu and Zn) usually corresponded to international guidelines, while some elements exceeded restrictions. Unique clusters were found using statistical analysis and hierarchical cluster analysis, emphasising the origins of local contamination. Overall, the Bistrica River meets Water Framework Directive (WFD) river quality categories, exhibiting good water quality. Heavy metal concentrations, particularly in soil and sediment, are safe, notwithstanding some localised concerns. This indicates that human activity is primarily responsible for the contamination and confirms the Bistrica river's generally good environmental state.

Keywords: Water, soil, sediment, ICP-OES, physicochemical parameters.

THE IMPACT OF VITAMIN D DEFICIENCIES ON ATHLETES HEALTH AND PERFORMANCE

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Abstract

Vitamin D is an essential nutrient playing an important role not only in bone and muscle health, but also in other human functions, with particular effects also in physical and sports performance. Vitamin D acts mainly in calcium homeostasis, regulating a number of vital functions such as musculoskeletal, neuro-muscular, hormonal, immune, nervous, etc. Vitamin D has received special attention in the last 10 years, because approximately one billion people worldwide present deficiencies. Reported data on these deficiencies are still not complete, comprehensive and accurate: however, the World Health Organization in 2021 declared the Vitamin D deficiency as a real concern for the population health worldwide. In addition to the deficiencies' data in the general population, those reported for the physically active groups and athletes of various sports, appear seriously threatening for the health of these subjects. In Albania, the data on Vitamin D deficiencies at population level are few and fragmentary, while in physically active groups and athletes are completely absent.

To address this issue, academic (PubMed, Google Scholar, and Web of Science), and organizations (WHO, WADA) databases were used to search for relevant publications. Specific keywords and phrases were used for papers' collection and selection. Out of 110 papers collected and published after 2016, 36 were selected and used for this review.

Deficiency of vitamin D affects all individuals, of both sexes, all ages and ethnicities, causing a series of health consequences. Insufficient serum levels of vitamin D cause bone, muscular and cardiovascular disorders, and others like arthritis, autoimmune diseases, diabetes, tumors and metabolic diseases. The subjects affected by these conditions are not only non-active individuals, but especially those who engage in regular physical activity and sports, due to the primary role of vitamin D for the neuro-motor and cardio-respiratory functions.

Being more exposed and at risk of this deficiency, it is important that athletes ensure adequate levels of vitamin D through exposure to sunlight, diet and supplements, in order to guarantee good health and optimize physical and sports performance.

Key words: vitamin D deficiency, sports performance, supplementation, athletes, health

**DEVELOPMENT OF ALGORITHM FOR PERFORMING OF CONSTRUCTION
EXPERTISE**

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The performing construction expertise manufacturing algorithm, labor cost and time determination methodology, for that the typical task of graph theory, the task of finding the shortest path, are developed.

The algorithm for performing of construction expertise is similar to the algorithm for зубашкыштп of other types of expertise. It is based on the application of methods necessary for its (stage) implementation at all stages of the examination.

The algorithm of performing of construction expertise that represents the sequence of stages of expertise, is presented in the figure below. on 1.

The methods used at each stage of the construction examination would be consistent with the selected methodology for conducting the real estate examination. At the same time, the methodology of real estate expertise describes several methods that provide a comprehensive and complete expertise and aim to solve the same task. In this case (when it is technologically possible to conduct an survey by any acceptable method in an expert institution), when determining the survey method, we propose to select a method based on the availability of resources (financial, time, human, etc.) in the expert organization. Thus, we propose to perform the search of methods as (a typical task of graph theory) the task of finding the shortest path.

In the article are developed the algorithm of performing of expertise processed, methodology of determining labor costs and time will provide great help to expert bureaus working in the field of real estate expertise.

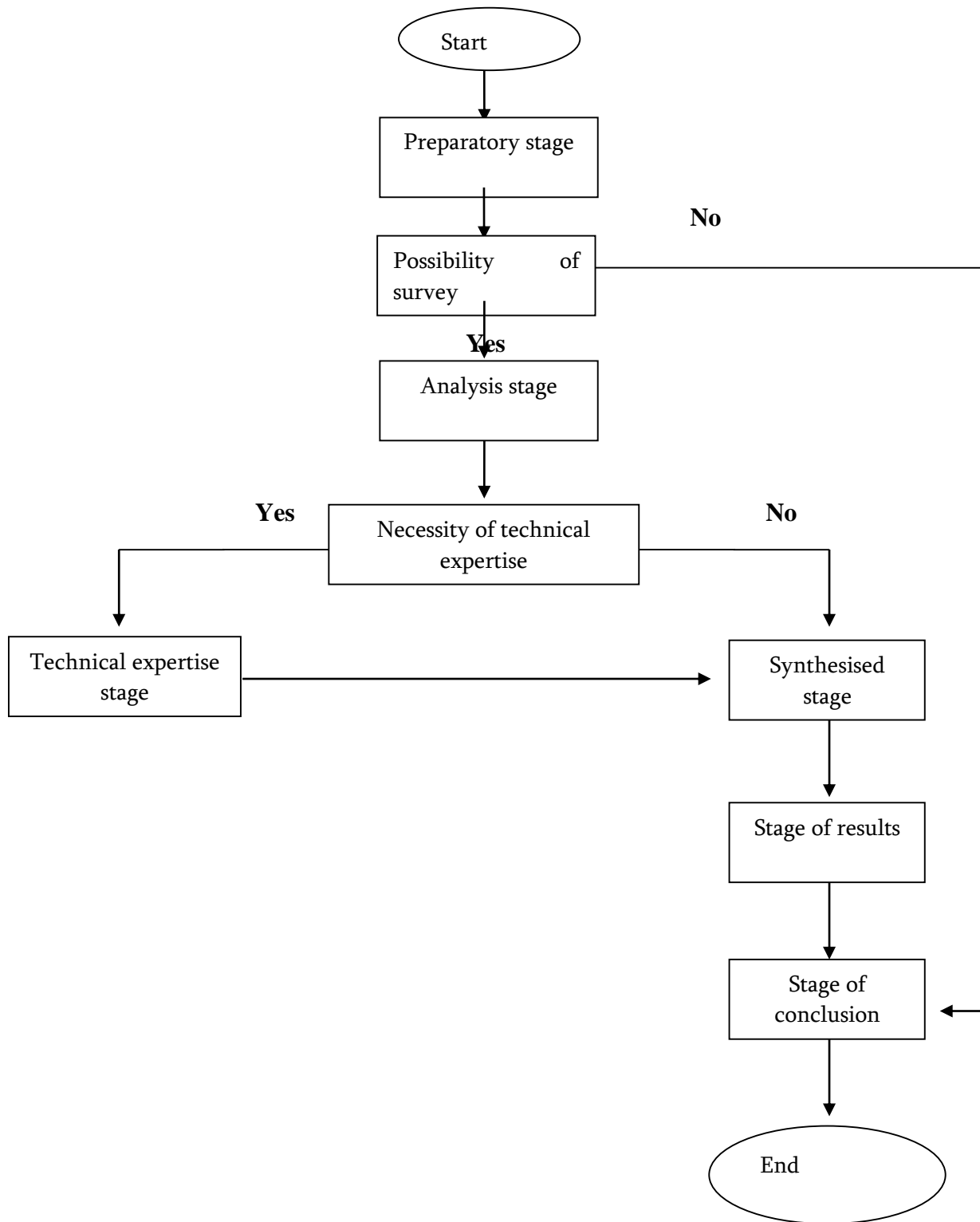


Fig. 1. Algorithm of real estate examination

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Keywords: construction, construction expertise, algorithm, graph method, expertise production, methodology.

THE ROLE OF STEM CELLS AND REGENERATIVE MEDICINE

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Abstract

Regenerative medicine and stem cells have come to light as exciting new areas with the potential to revolutionize healthcare. Because of their special qualities, which include the capacity for self-renewal and differentiation, stem cells are crucial for tissue regeneration and repair. This article examines the revolutionary effects of regenerative medicine and stem cells on healthcare, emphasizing the range of medical disorders for which they can be used. This article highlights the noteworthy progress made in using stem cells' regenerative potential for medicinal applications through an extensive analysis of current developments and clinical results.

Introduction

In contemporary medicine, stem cells are a paradigm shift that present previously unheard-of possibilities for tissue regeneration and repair. A new era in healthcare is being ushered in by regenerative medicine, which is driven by advancements in stem cell research and attempts to replace lost or damaged tissues and organs. An overview of how stem cells and regenerative medicine are changing healthcare is given in this article, with an emphasis on the treatments and clinical uses of these technologies.

Stem Cells

Undifferentiated cells with the ability to self-renew and differentiate into distinct cell types are known as stem cells. They can be broadly divided into three categories: adult stem cells, induced pluripotent stem cells (iPSCs), and embryonic stem cells (ESCs). With the greatest potency, embryonic stem cells (ESCs) can differentiate into any type of cell in the body. ESCs are formed from the inner cell mass of blastocysts. Similar to ESCs in their pluripotent characteristics, reprogrammed somatic cells (iPSCs) provide a non-controversial and patient-specific cell source. Adult stem cells are present in many tissues and are essential for tissue upkeep and repair.

Regenerative Medicine

Regenerative medicine uses tissue engineering, stem cells, and biomaterials to help injured tissues and organs grow back and function normally. It includes a broad spectrum of therapeutic approaches, including as gene therapy, tissue engineering, cell-based therapeutics, and small-molecule interventions. Numerous illnesses, such as autoimmune diseases, musculoskeletal injuries, neurological problems, and cardiovascular ailments, may be treated in the future with stem cell-based therapies.

Clinical Applications

Clinical stem cell applications have demonstrated great potential across a number of medical specializations, providing cutting-edge therapeutic strategies for the treatment of numerous illnesses and ailments. Among the noteworthy clinical uses are:

Using bone marrow, peripheral blood, or umbilical cord blood, hematopoietic stem cells (HSCs) are utilized in hematopoietic stem cell therapy (HSCT) to treat hematological malignancies like multiple myeloma, lymphoma, and leukemia. Hematopoiesis and immunological function are restored in patients undergoing hematopoiesis stem cell transplantation (HSCT) by infusing HSCs after high-dose chemotherapy or radiation therapy.

Cardiovascular Regeneration: After a myocardial infarction (heart attack), stem cell therapies may be able to restore and regenerate damaged cardiac tissue. Through paracrine actions, neovascularization, and differentiation into cardiomyocytes, mesenchymal stem cells (MSCs), induced pluripotent stem cells (iPSCs), and cardiac progenitor cells have been studied for their potential to improve heart function and reduce scar formation.

Neurological Disorders: Stem cell-based therapies offer prospective treatments for neurodegenerative disorders such as Parkinson's disease, Alzheimer's disease, and amyotrophic lateral sclerosis (ALS). Neural stem cells (NSCs) and induced pluripotent stem cell-derived neurons have been studied for their ability to replace injured neurons, improve neuroprotection, and modify inflammatory responses in the central nervous system.

Orthopedic Regeneration: The regenerative potential of stem cells, in particular mesenchymal stem cells (MSCs), has been studied in orthopedic disorders such as bone fractures, osteoarthritis, and cartilage abnormalities. MSCs can develop into osteoblasts and chondrocytes, which aid in the mending of bones and cartilage. Furthermore, trophic substances that facilitate tissue healing and lower inflammation are secreted by MSCs.

Autoimmune Diseases: Rheumatoid arthritis, multiple sclerosis, and systemic lupus erythematosus have all been studied as possible candidates for stem cell transplantation as a treatment. By eliminating autoreactive immune cells and reassembling a tolerant immunological repertoire, hematopoietic stem cell transplantation (HSCT) seeks to reset the immune system and induce disease remission or stabilization.

Tissue Engineering and Regenerative Medicine: Tissue engineering techniques that attempt to replace or repair damaged tissues and organs heavily rely on stem cells. Tissue-engineered structures have the ability to replicate the natural tissue microenvironment and promote functional tissue regeneration by integrating stem cells with biomaterial scaffolds and growth factors. Organ transplantation, cartilage implants, and skin grafting are a few applications.

Ocular Regeneration: Age-related macular degeneration (AMD), retinitis pigmentosa, and corneal abnormalities are among the ocular diseases for which stem cell-based therapies show promise. The potential of pluripotent stem cell-derived retinal pigment epithelial (RPE) cells to replace damaged RPE cells and improve vision in AMD patients has been studied.

Challenges and Future Directions

In spite of the enormous advancements, there are still a number of obstacles in the way of stem cell research and regenerative medicine. These include immunological rejection, scalability of cell production, safety problems, ethical issues, and tumorigenicity. It will take interdisciplinary teamwork, strict regulatory control, and ongoing research and development funding to overcome these obstacles. The field's next steps include improving stem cell homing and engraftment, refining cell transport techniques, and investigating new stem cell sources like prenatal tissues and bioengineered organs.

Conclusion

Regenerative medicine and stem cells have the potential to completely transform healthcare by providing cutting-edge treatments for a variety of illnesses. Utilizing a multidisciplinary strategy that includes basic science, translational research, and clinical trials, stem cells' capacity for regeneration can be used to fill gaps in medicine and enhance patient outcomes. With the potential to revolutionize treatment and usher in an era of customized regenerative medicines, the future of medicine appears more bright as we continue to untangle the mysteries of stem cell biology and tissue regeneration.

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**ARTIFICIAL INTELLIGENCE, DIGITAL TECHNOLOGY AND THE COVID
GENERATION: TOWARDS ACADEMIC MEDIOCRITY AND STUDENT ANXIETY?**

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Abstract

The purpose of this research was to investigate attitudes of students concerning Artificial Intelligence tools and digital technologies in the L2 classroom. The study was a descriptive quantitative-qualitative mixed methods case study whose data was taken from a purposive, convenient sample at a private, English-speaking university during the Summer and Fall Semester of 2023 as well as the Spring semester of 2024 in Beirut, Lebanon. Data collection primarily involved an online survey on Google forms which was given to a sample of 257 students taking a research-based English 102 and 202 courses. Afterwards, twenty-five students were chosen based on their voluntary will to participate in semi-structured focus group interviews which covered students' attitudes and experiences using AI tools as well as varied digital technologies. The findings from students revealed that AI tools and digital technologies may likely have contributed to increased anxiety-related issues and compromised self-confidence possibly due to students' over-reliance and misuse of AI and digital tools, thus stunting student creativity, forgoing learning objectives, and compromising performance as well as taxing students' overall mental and emotional well-being.

Keywords: Artificial intelligence, ethical uses of AI, L2 classrooms, digital technology and L2 learning, Chatbot GPT and ethics, writing mills, anxiety, Covid 19, anxiety issues

**INFLUENCE OF GEOGEBRA ON SENIOR HIGH SCHOOL STUDENTS' CONCEPTUAL
AND PROCEDURAL KNOWLEDGE OF AREA UNDER THE CURVE**

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ABSTRACT

This study sought to ascertain how the GeoGebra software influenced senior high school students' conceptual and procedural understanding of the area under a curve in Kassena- Nankana Municipality in the Upper East Region of Ghana. With an experimental and control group of 40 students each, the study was quasi-experimental in nature. The study used questionnaires and achievement tests as its research instruments. To address the study objectives and assess the null hypothesis, descriptive and inferential statistics were used to analyze the data from the pre-and post-tests. An independent samples t-test was conducted to compare the means of the two groups. There was a statistically significant difference in conceptual knowledge performance between the experimental and control groups ($t = 2.883, p < 0.05$). The experimental group outperformed their counterparts in the control group in terms of their conceptual knowledge of the area under the curve. Also, there was a significant difference between the experimental and control groups in terms of procedural knowledge of the area under the curve ($t = 3.656, p < 0.05$). The experimental group performed better in the procedural knowledge test than their peers in the control group. Also, there was a strong positive correlation between the perceived usefulness of the GeoGebra instructional package and students' attitudes towards using the GeoGebra software ($r(38) = 0.76, p = 0.034$). The study also revealed that there was a very strong positive correlation between the perceived ease of use of the GeoGebra instructional package and students' attitudes towards using the GeoGebra software ($r(38) = 0.81, p = .000$). Based on the findings of the study, it was recommended that the GeoGebra software should be used in the teaching and learning of calculus-related concepts.

Keywords: GeoGebra, Conceptual Knowledge, Procedural Knowledge, Open- Source software, Visualization

INTRODUCTION

Technology has become a crucial teaching and learning tool for mathematics at any level because it can enhance the way the subject should be taught and strengthen students' understanding of fundamental concepts (Atteh et al, 2020). Nations everywhere in the globe are making significant investments in the creation of innovative and potent instructional strategies for the teaching of mathematics to encourage learning, foster achievement, and give all students from both well-equipped and under-equipped schools an equal chance to participate in the educational process. According to a study conducted by Tay and Mensah-Wonkyi (2018), incorporating information and communication technology is a cutting-edge approach to teaching mathematics that motivates learning and improves student performance in both well-resourced and under-resourced schools.

Inconsistent results have been highlighted in research on how technology is used in mathematics education and learning. While other researchers have demonstrated that using technology effectively helps students understand and enjoy mathematics (Tay et al, 2012), some researchers (Goodison, 2002; Hourigan and O'Donoghue, 2007; Biagi and Loi, 2013) acknowledged that using technology in teaching and learning mathematics does not lead to significant gains in learning outcomes.

Two significant technological platforms that are mainly used when teaching mathematics are Computer Algebra Systems (CAS) and Dynamic Geometry Software (DGS). In essence, DGS enables the exploration of mathematical concepts through the observation of modifications to the object brought about by the dynamic movements of the independent object, whereas CAS can generate graphs of numerical, symbolic, and multivariable functions. GeoGebra, a software that combines DGS and CAS characteristics, is a key component of the learning environment used at all stages of the educational structure (Hohenwarter and Jones, 2007). Geogebra is a powerful tool in mathematics education that allows students to visualize abstract concepts and dynamically explore mathematical ideas. It is a software program that integrates geometry, algebra, and calculus in a user-friendly interface that is accessible to students of all ages and abilities. The GeoGebra software has the potential to assist students in graphically, contextually, and dynamically visualizing abstract concepts, which is most challenging to demonstrate using the conventional teaching method (Arini and Dewi, 2019).

Integral calculus is seen as a crucial topic in mathematics because of its widespread application in fields as diverse as biology, physics, engineering, social sciences, and economics (Arini and Dewi, 2019). Given its importance, it is critical to concentrate integral calculus teaching and learning on developing conceptual rather than instrumental understanding only. Despite the importance of emphasizing conceptual development in calculus teaching and learning, the conventional teaching method has been the preferred method for decades. According to a growing body of evidence, teaching and learning calculus focus more on computational processes than underlying concepts that result in routine algebraic manipulations (Lasut, 2015). According to Kossivi (2020), integral calculus is a challenging topic that needs effective tuition, if learners are to be appropriately prepared for higher-level Science, Technology, Engineering, and Mathematics (STEM) related courses and careers

Even though in Ghana, the integration Information and Communication Technology (ICT) tools are highly recommended to be utilized in mathematics instruction at Ghanaian Senior High schools, mathematics instructors still do not integrate current ICT tools into their classroom practice (Agyemang and Mereku, 2015). This phenomenon makes students passive recipient of knowledge which does not help them to understand abstract mathematical concepts. There has been a continuous decline in students' performance in Elective Mathematics especially integral calculus, according to the Chief Examiner's reports of the West African Examination Council (WAEC) from 2014 to 2022. The Chief Examiner's report indicated that most of the candidates cannot visualize the concept of area under the curve. They therefore, recommended that Mathematics teachers should use innovative ways to assist learners understand the concept of area under the curve. The GeoGebra software is a

versatile tool that helps students visualize abstract mathematical concepts, which is naturally difficult to demonstrate conventionally (Arini and Dewi, 2019).

Research on the influence of GeoGebra on students' conceptual and procedural understanding of the area under the curve is still limited and scarce in Ghana. It is against this background that, a study was conducted to determine the influence of GeoGebra on students' conceptual and procedural understanding of the area under the curve.

Theoretical Framework

The study used two theoretical frameworks to guide the direction of the study. They include the social–constructivist theory of and the Technology Acceptance Model (TAM). The theoretical framework supporting the study was based on social-constructivism's ideas about learning through technology. Cobb, Yackel, and Wood (1992) defined constructivist learning as the representational view of the mind and active construction, where students modify their own mental models to construct. The idea that teachers transmit knowledge across generations is in contrast to this. Constructivism holds that learners produce knowledge and meaning based on their subjective perceptions of the outside world. Constructivist classrooms are thought to improve learning and academic attitude because the teacher acts as a facilitator and students actively create information by interacting and interpreting concepts from social and individual experiences as well as past knowledge (Abiatl and Howard, 2020). Constructivists distinguish between two schools of thought: cognitive and social. According to social constructivists, learning is promoted by information exchange, negotiation, and dialogues, and knowledge is produced cooperatively in a sociocultural setting (Mushipe and Ogbonnaya, 2019). Because of this, social constructivists stress the value of a classroom setting that encourages interaction and teamwork. For cognitive constructivists, learning is primarily an individual endeavour; as such, instructional design should support and meet the needs of each individual learner to produce knowledge. Although constructivism has been defined in a variety of ways due to its diverse theoretical underpinnings, these perspectives all emphasize a learner-centered approach to instruction and the construction of knowledge rather than its passive absorption (Mushipe and Ogbonnaya, 2019). In a constructivist classroom, the instructor provides materials and activities to make sure students are actively involved in creating their own knowledge. As a result, technology-based learning environments like GeoGebra, which feature visually appealing visual displays along with collaborative tools, provide learners with more dynamic and impactful experiences. In this sense, environments are filled with incentives that propel students towards successful constructions (Malabar and Pountney, 2002).

The Technology Acceptance Model (TAM), created by Fred Davis in 1989, also serves as the study's theoretical framework. The Technology Acceptance Model is crucial for understanding the elements that influence whether or not people will accept a technology. A theory of information systems called the Technology Acceptance Model explains how users of technology come to accept and use it. TAM asserts that user attitudes toward technology use, subsequent behavioural intentions, and actual usage are all influenced by how useful and user-friendly the technology is viewed to be. The usefulness of a piece of technology was also believed to be influenced by how user-friendly it was. In the TAM, perceived usefulness refers to how much the user believes using the innovation will improve their capacity to perform at work, whereas perceived ease of use refers to how simple they believe using the technology will be. Despite the presumption that perceived usefulness and attitude toward using technology are influenced by perceived ease of use, both are seen as separate factors influencing the user's attitude toward using the technology. Technology use behaviour is influenced by a person's attitude toward using it. No matter how sophisticated or powerful the technology, its successful application depends on users' positive attitudes toward it (Liaw, S.S, et al, 2007).

The diagram below shows the Technology Acceptance Model (TAM) and how the variables interplay to influence one's acceptance of a new technology.

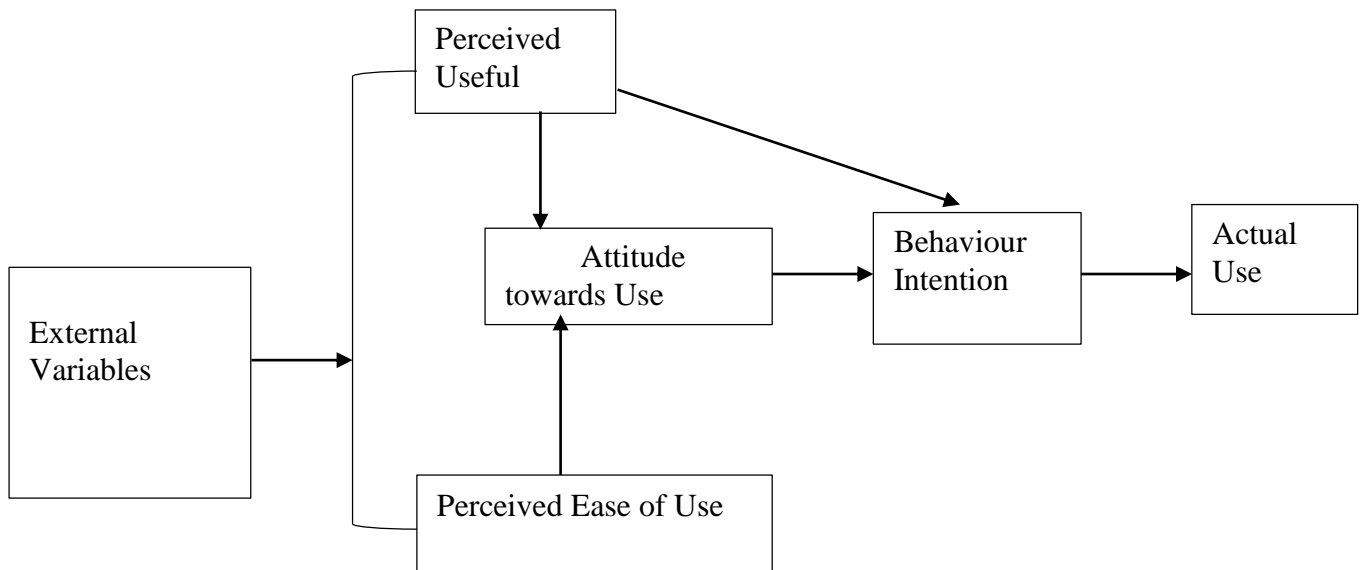


Figure 1: Technology Acceptance Model (Fred, Davis, 1989).

RESEARCH OBJECTIVES

The following specific objectives guided the study:

To determine:

1. the influence of GeoGebra teaching strategy on students' conceptual understanding of the area under the curve.
2. the influence of GeoGebra teaching strategy on students' procedural understanding of the area under the curve.
3. the relationship between the perceived usefulness of the GeoGebra instructional package and students' attitudes towards the GeoGebra instructional strategy.
4. the relationship between the perceived ease of use of the GeoGebra instructional package and students' attitudes toward the GeoGebra instructional strategy.
- 5.

RESEARCH HYPOTHESIS

To empirically examine objectives 1,2,3, and 4 of the research, the study proposed to quantitatively test the following stated null hypotheses at $P < 0.05$ level of significance.

H01: There is no statistically significant difference in conceptual understanding of the area under the curve between the control group and experimental group.

H02: There is no statistically significant difference in procedural understanding of the area under the curve between the control group and the experimental group.

H03: The perceived usefulness of the GeoGebra instructional package has no relationship with the attitude of students toward the GeoGebra instructional package.

H04: The perceived ease of use of the GeoGebra instructional strategy has no relationship with the attitude of students toward the GeoGebra instructional package.

MATERIALS AND METHODS

The positivist world view was the paradigm that underpins the study. Therefore, a quantitative approach was used to examine the influence of GeoGebra on students' conceptual and procedural understanding of the area under the curve. This study employed a quasi-experimental approach with Pre-test, Post-test Non-equivalent groups. This indicates that prior to the experiment, a pretest was

administered to students in the experimental and control groups to determine their prior knowledge of the subject. A six-week intervention programme with three hours of interaction time each week ensued after the pretest. While the control group was instructed using conventional methods, the experimental group was taught area under the curve utilising the GeoGebra software. Each test was given to both study groups at the same time. This design was the most appropriate design for the study because it sought to examine the effect of a treatment on its target population (Dinardo, 2008).

The population of the study was all Form 2 Elective Mathematics students in Kasena-Nakana Municipality of Upper East of Ghana. In all 80 Participants served as the sample size consisting of 2 – intact classes of 40 students each. Purposive and simple random sampling techniques were used to select the participants for the study. Two research instruments, an achievement test (pre-test and post-test) and a questionnaire, were used to collect data from the participant.

A pilot-study was conducted to determine the reliability of the research instruments. The test-retest method was then used to determine the reliability of the pre-test and post-test items. The Pearson Product Moment Coefficient was then used to determine the reliability coefficient of the pre-test and post-test. The reliability of the pre-test and post-test was $r = 0.89$ and $r = 0.78$ respectively. The Pre-test and post-test items were therefore deemed reliable and fit to be used as data instruments from the participants. The Cronbach's Alpha was used to evaluate the reliability of the questionnaire. The results showed a reliability coefficient of 0.81. The content validity of the research instruments was determined by expert scrutiny.

Using SPSS version 25.0, both descriptive and inferential statistics were used to analyze the achievement test data. To ascertain whether there was a statistically significant difference between the experimental and control groups prior to and following the intervention, the independent samples t-test was employed. A preliminary analysis was performed before the data analysis to test the basic assumptions underlying the independent samples t-test. The independent sample t-test was selected as the method of statistical analysis for this study because it is a statistical tool for comparing two samples in terms of their mean difference and assessing whether or not this difference is statistically significant. All computations of t-test analysis were done at $\alpha = .05$ level of significance. The Pearson Correlation coefficient was computed using the Statistical Package for Social Science (SPSS) to determine the relationship between perceived usefulness, perceived ease of use of GeoGebra and students' attitude towards the GeoGebra instructional package.

RESULTS

Analysis of the results of the Pre-test

The pre-test was administered to both groups prior to the intervention. The pre-test was used to examine if students in the experimental and control groups had comparable baseline knowledge of differentiation and integration before the intervention. Table 1 shows the results and analysis of the pre-test scores.

Table 1: Results of Independent Samples t-test of the Pre-test

Group	Mean	S. D	Mean Difference	t-value	Sig.(2-tailed)
Experimental(n=40)	14.250	3.765	0.475	0.609	0.545
Control (n=40)	13.7750	3.193			

The results from Table 1 showed that the experimental group demonstrated significantly higher mean scores ($M = 14.250$, $SD=3.193$) compared to the control group ($M=13.775$, $SD=3.765$). There was a 0.475 difference in the mean scores across the groups, with a t -value of 0.609 ($t < |1.96|$). However, the p-value was 0.545 ($p > .05$), indicating that the two groups' mean scores did not differ significantly. This finding suggests that students' skills in the control and experimental groups were comparable prior to the intervention. As a result, any variations in students' performance in the area under the curve could be attributed to the treatment.

Analysis of the Conceptual Knowledge Test scores (Post-test)

The effectiveness of instructions with and without GeoGebra was compared using an independent samples t-test. The independent variables in the analysis were the type of instruction with or without GeoGebra. The dependent variables were the students' conceptual knowledge scores. A null hypothesis was formulated to guide the independent samples t-test.

Null hypothesis (H₀): *There is no statistically significant difference in the conceptual understanding of the area under the curve between the control group and the experimental group.*

Alternative hypothesis (H₁): *There is a statistically significant difference in the conceptual understanding of the area under the curve between the control group and the experimental group.* The results of the independent samples t-test are shown in Table 2.

Table 2: Results of Independent Samples t-test of the Conceptual Knowledge test scores (Post-test)

Group	Mean	S. D	Mean Difference	t-value	Sig.(2- tailed)
Experimental(n=40)	15.575	2.308	3.950	2.843	0.000
Control (n=40)	11.625	2.192			

According to the data in Table 2, the experimental group ($M= 15.575$, $SD = 2.308$) performed better on the procedural knowledge test scores on average than the control group ($M = 11.625$, $SD= 2.192$). There was a 3.950 difference in the mean scores across the groups, with a t -value of 2.843 ($t > |1.96|$). However, the p-value was low p-value of 0.000 ($p < .05$), indicating that the two groups' mean scores did differ significantly. Consequently, the null hypothesis (H_0) was rejected while the alternative hypothesis (H_1) was supported. Hence, there is a statistically significant difference in the conceptual understanding of the area under the curve between the control group and the experimental group. The experimental group fared better on the conceptual knowledge test in area under the curve than their counterparts in the control group.

Analysis of Procedural Knowledge Test scores (Post-test)

The mean scores of the procedural knowledge test for the experimental group and the control group were compared using an independent samples t-test to determine whether there was a significant difference. The significance of the difference in average performance between the control and experimental groups was determined using an independent samples t-test. A significance level of 0.05 was used to evaluate the stated null hypothesis:

Null hypothesis (H₀): *There is no statistically significant difference between the control and experimental groups in their procedural knowledge of the area under the curve.*

Alternative hypothesis (H₁): *There is a statistically significant difference in the procedural understanding of the area under the curve between the control group and the experimental group.* The results of the independent samples t-test are displayed in Table 3 below.

Table 3: Results of Independent Samples t-test of the Procedural Knowledge test scores (Post-test)

Group	mean	S. D	Mean Difference	t-value	Sig.(2-tailed)
Experimental(n=40)	15.500	2.038	1.825	3.656	0.000
Control (n=40)	13.675	2.411			

The results from Table 4 revealed that there is a significant difference in the procedural knowledge test results between the experimental group (M = 15.500, SD = 2.038), and the control group (M = 13.675, SD = 2.411; $t(78) = 3.656$, $p < 0.05$). Consequently, the null hypothesis (H_0) was rejected while the alternative hypothesis (H_1) was supported. As a result, the findings revealed that using GeoGebra in the teaching area under the curve improves students' procedural performance. Students in the experimental group did better on the procedural knowledge test than those in the control group who were taught area under the curve without using GeoGebra.

Analysis of the Questionnaire

To establish the statistical significance of the hypotheses, the Pearson Correlation Coefficient was used. The following null hypotheses was formulated to assess the level of significance.

HO3: *There is no significant relationship between the perceived usefulness of the GeoGebra instructional package and students' attitudes toward it.*

HO4: *There is no significant relationship between the perceived ease of use of the GeoGebra instructional package and students' attitudes toward it.* The table below shows the results of the correlational analysis of the questionnaire responses:

Table 4. Results of Pearson Correlation Analysis of the Questionnaire

		Attitude
Perceived Usefulness	Pearson Correlation	0.76
	Sig.(2-tailed)	0.034
	N	40
Perceived Ease of Use	Pearson Correlation	0.81
	Sig.(2-tailed)	0.00
	N	40

A Pearson correlation coefficient was used to investigate the linear relationship between the perceived of the GeoGebra instructional package and students' attitudes towards its use. The results in Table 4 revealed that there was a positive correlation between the perceived usefulness of the GeoGebra instructional package and students' attitudes towards using the GeoGebra software, $r(38) = .76$, $p = .034$. This demonstrates that there is a positive and statistically significant relationship between the perceived usefulness of the GeoGebra software and students' attitudes towards its use. Therefore, null hypothesis was thus rejected. Hence, there is a significant relationship between the perceived usefulness of the GeoGebra instructional package and students' attitudes toward it.

Also, the correlation between students' attitudes towards using the GeoGebra teaching tool and their perceived ease of use of it was evaluated by the researcher by using the Pearson correlation coefficient. There was a strong positive correlation between the perceived ease of use of the GeoGebra instructional package and students' attitudes towards using the GeoGebra software, $r(38) = .81$, $p = .000$. This indicates that there is a positive and statistically significant relationship between perceived ease use of the GeoGebra software and students' attitudes toward it. Hence, the null hypothesis was rejected.

DISCUSSIONS

One of the objectives of the study was to determine how the GeoGebra teaching strategy influenced students' conceptual understanding of the area under the curve. To gain a deeper insight into how GeoGebra enhances students' understanding of this topic "area under the curve", research hypothesis was formulated and tested at a significance level of 5%. A comparison was made between the conceptual knowledge scores of the control and experimental groups using an independent samples t-test. The results from Table 2, revealed that there was a significant difference in the means of the experimental group ($M = 15.575$, $SD = 2.308$) and the control group ($M = 11.625$, $SD = 2.192$; $t(78) = 7.848$; $p = .000 < .05$). This suggests that the experimental group had a better conceptual understanding of the area under the curve compared to the control group. The finding of the study collaborates with the findings of the research conducted by Kado and Dem (2020), Hodanbosi (2001), Sari (2017), Zulnaldi and Zakaria (2012), Tatar and Zengin (2016). This finding aligns with the principles of social-constructivist theory of learning. According to social-constructivist theory, learning is an active process that occurs through social interaction and the construction of knowledge based on personal experiences. In this context, the use of GeoGebra as a dynamic mathematics software can provide students with opportunities for active engagement, exploration, and collaboration. By using GeoGebra, students can visually and interactively manipulate graphs and explore the concept of the area under the curve. This hands-on experience allows them to construct their understanding of the concept, make connections between mathematical representations, and engage in meaningful discussions with their peers and the teacher. This finding supports the idea that providing students with interactive tools and opportunities for active learning can enhance their conceptual understanding, as advocated by social – constructivist theory (Mayer, R. E., 2004).

An independent samples t-test was performed to determine if there was a statistically significant difference in mean procedural knowledge scores between the control and experimental groups. The t-test findings revealed a statistically significant difference in the mean procedural knowledge scores between the experimental group ($M = 15.500$, $SD = 2.0381$) and control groups ($M = 13.675$, $SD = 2.411$; and $t(78) = 3.656$, $p = .000 < .05$). The experimental group outperformed the control group in the procedural knowledge test after the intervention. This finding suggests that using GeoGebra to teach the area under the curve concept has improved students' procedural understanding. The experimental group, which used GeoGebra as a learning tool, had higher mean procedural knowledge scores than the control group, which did not use GeoGebra. According to the social constructivist theory of learning, the interactive and dynamic nature of GeoGebra may have aided students' knowledge construction through social interactions and collaborative problem-solving. GeoGebra provided a platform for students to engage in hands-on exploration, experimentation, and discussions

in this case, which most likely contributed to their improved procedural understanding (Hohenwarter, M., & Preiner, J., 2007). This conclusion contradicts the findings of Engelbrecht et al. (2005), who stated that after learning and implementing a new approach employing a visual method, students' procedural understanding is lower.

The data obtained from the administration of the questionnaire was analysed using Statistical Packages for Social Sciences. The Pearson Correlation Coefficient was used to determine the significance of the hypothesis. The results revealed that there is a strong positive correlation coefficient between perceived usefulness of GeoGebra and students' attitude toward the use of the software ($r(78) = .76, p = .034 < .05$). This finding validates the findings of previous research conducted by Ibili et al. (2019). Consequently, null hypothesis was rejected, indicating that students' attitudes toward the use of GeoGebra in calculus learning environments will improve when they have a better perception of the software's usefulness. As a result, it is critical for mathematics educators who use ICT tools to teach mathematics to demonstrate to their students how the use of technology can help them better understand mathematics.

The Pearson correlation coefficient was computed to determine the relationship between perceived ease of use of the GeoGebra software and students' attitude toward the GeoGebra instructional package. The results revealed that there is a significant strong positive correlation between the perceived ease of use of the GeoGebra software and the students' attitude towards the GeoGebra instructional package ($r(78) = .81, p = .000 < .05$). This finding corroborates the findings of previous studies conducted by Briz-Ponce, et al (2017); Revythi and Tselios, 2019; Verma and Sinha, 2018. In their research they discovered that Perceived Ease of Use (PEU) has a direct positive effect on students' attitudes towards the GeoGebra instructional package. This suggests that their views of the GeoGebra instructional package are significantly influenced by their perceptions of its perceived ease of use. However, this finding contradicts the findings of Drennan, Kennedy, and Pisarski (2005) and Ibili et al (2019).

In conclusion, integrating GeoGebra into mathematics instruction and learning could improve students' conceptual and procedural understanding. The study also discovered that students' attitudes toward the GeoGebra instructional package are positively impacted by their perceived usefulness and perceived ease of use of the GeoGebra software.

CONCLUSION

This study attempted to determine the influence of GeoGebra on students' conceptual and procedural understanding of area under the curve. Based on the findings of the study the following inferences were made:

1. GeoGebra, as an instructional tool, helps to raise academic achievement in mathematics. The research suggests that using GeoGebra to teach calculus in general and the area under the curve, in particular, is a good approach. When compared to students who learned the area under the curve using the conventional teaching method, those who used GeoGebra to learn the area under the curve had a more thorough understanding of the topic, both conceptually and procedurally.
2. From the results of the study it can be inferred that the GeoGebra software helps students to visualize abstract mathematical concepts that are too difficult to demonstrate using the conventional teaching method.
3. Furthermore, the findings of the study point to the fact that cutting-edge approaches, such as integrating GeoGebra into classroom instruction, are more effective than conventional methods of instruction. As a result, these approaches can be used in the classroom as blended instruction.
4. Also, the findings of the study led to the conclusion that students' attitudes toward the GeoGebra instructional package are influenced by their perceptions of how useful and user-friendly the instructional is. This means when students think that an ICT tool will assist them to perform an activity with ease will develop a positive attitude towards the use of the ICT tool. This highlights the

importance of designing educational tools that are not only effective but also user-friendly and accessible to students.

The following recommendations were based on the findings of the study:

1. Mathematics teachers should incorporate the GeoGebra teaching strategy when teaching the topic area under the curve. This will help students to develop their conceptual and procedural understanding of area under the curve.
2. Mathematics teachers should consider the perceived usefulness and perceived ease of use of any Information Communication and Technology tool that they want to employ in their lessons. The findings of the study revealed that the perceived usefulness and perceived ease of use of the GeoGebra instructional package was positively correlated with the attitude of students towards the use of the GeoGebra instructional package.
3. It is recommended that University Colleges of Education should incorporate GeoGebra into their mathematics curricula. The pre-service teachers will benefit from having the pedagogical knowledge they need to successfully incorporate GeoGebra into their lessons.

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**ARTICLE 260 OF THE VIETNAMESE CRIMINAL CODE 2015 THE PRIMARY
LEGAL BASIS FOR DEALING WITH ROAD TRAFFIC ACCIDENTS IN VIETNAM
LIMITATIONS ON TECHNICAL PRESENTATION AND RECOMMENDATIONS FOR
IMPROVEMENT**

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Summary

One of the current social issues of concern is whether legal liability due to violations of road traffic regulations is sufficiently punitive to help limit violations or not. Regarding criminal liability, offenders will be held accountable for offenses stipulated in Article 260 of the Vietnamese Criminal Code of 2015, as amended and supplemented in 2017 (in the future referred to as the Criminal Code), which is “Violations of regulations on road traffic participation”. This article investigates the legal signs of this crime, analyzes the technical inadequacies, presents current legal regulations on the crime of violating regulations on road traffic participation, and makes proposals to improve these legal provisions.

Keywords: road traffic; traffic safety; legal responsibility; criminal;

Introduction

In recent years, road traffic accidents have seriously challenged safety and social order. According to the National Traffic Safety Committee's information on traffic accidents, 2023 there were 22,067 traffic accidents nationwide, resulting in 11,628 deaths and 15,292 injuries¹. In this context, regulations on legal responsibility in traffic accidents are considered an important tool to ensure fairness and maintain traffic safety. Criminal liability for traffic safety violations is currently stipulated in Section 1, Chapter XXI of the Vietnamese Criminal Code of 2015, amended and supplemented in 2017. Although specific regulations are in place, implementing and applying these regulations still need to be improved.

The offense of violating road traffic participation regulations under Article 260 of the Criminal Code stipulates the legal responsibilities of individuals causing traffic accidents. However, the technical presentation of this law still needs to be improved. Therefore, to overcome these limitations and improve the effectiveness of criminal handling in road traffic accidents, it is necessary to discuss and propose solutions to perfect criminal law, including improvements in the technical presentation of the law.

Content

1. Legal signs of the offense of violating road traffic participation regulations

Criminal liability for violating road traffic participation regulations is a shared responsibility that road users must bear when committing acts that violate road traffic safety regulations, causing accidents and resulting in severe consequences for the lives, health, and property of others. Therefore, to reduce the incidence of road traffic accidents, lawmakers have established strict regulations and penalties to address road traffic participation regulations violations. Including this

¹ Pham Cong (2024), "Nationwide, there were 22,067 road traffic accidents," accessed on April 15, 2024, from the website: <https://kinhtedothi.vn/ca-nuoc-xay-ra-22-067-vu-tai-nan-giao-thong>.

offense in the Criminal Code demonstrates its reasonableness and necessity regardless of time or circumstance.

Traffic accidents are collisions, crashes, or impacts that occur when vehicles move on roads, railways, waterways, or airways, causing damage to human lives, health, property, and vehicles. From a legal perspective, traffic accidents are understood as follows:

"A traffic accident is an incident that occurs when a participant in road traffic violates road traffic order and safety regulations or encounters an unexpected incident, causing particular damage to the lives, health, or property of individuals, organizations, or entities. Traffic accidents include:

- a) Traffic collision;
- b) Traffic accident causing minor consequences;
- c) Traffic accident causing severe consequences;
- d) Traffic accident causing dire consequences;
- đ) Traffic accident causing grave consequences"²

Road traffic accidents for which the responsible party must bear criminal liability under Article 260 of the Vietnamese Criminal Code of 2015 all result in severe or more significant consequences based on the fact that the person causing the accident committed acts that violated road traffic safety regulations. The road traffic safety regulations mentioned in this law are stipulated in the 2008 Law on Road Traffic and related documents³. Article 260 of the Criminal Code stipulates the offense of violating road traffic participation regulations by stating: "Anyone participating in road traffic who violates road traffic safety regulations causing damage to..." without specifying what constitutes a violation of road traffic safety regulations. Therefore, to determine the elements of this offense, one must refer to the 2008 Law on Road Traffic and the Government's Decree on administrative penalties in the field of road traffic. Only when it is established that the road traffic participant causing the accident violated the regulations specified by the Law and Decree on road traffic safety, resulting in the damage outlined in Article 260 of the Criminal Code, can it be affirmed that the person has committed the offense?

- **The object of the crime**

A person who violates road traffic participation regulations commits a socially dangerous act that directly infringes on road traffic safety and causes damage to the lives, health, and property of others. Only those violations of road traffic regulations that are highly dangerous, cause harm to life or cause serious harm to the health and property of others, and actions that are likely to result in dire consequences if not promptly prevented, are considered criminal offenses.

For example: A, 30 years old, was operating a motorcycle at high speed and lost control, crashing into the rear of another motorcycle driven by Ms. N, which was traveling in the same direction. As a result, Ms. N fell to the ground and died, and both motorcycles were severely damaged. In this case, A caused the accident and violated the road traffic safety regulations by driving at high speed and failing to control the vehicle, which led to Ms. N's death.

² According to the regulations in Clause 1, Article 5 of Circular No. 58/2009/TT-BCA(C11), which provides guidelines for statistics, synthesis, database construction, and provision of information on road traffic accidents issued by the Ministry of Public Security.

³ This is referred to as an indirect provision. An indirect provision is a regulation that does not directly indicate the signs of criminal behavior but refers to other legal normative documents. The rules on traffic safety in Article 260 of the Criminal Code, amended and supplemented in 2017, indirectly refer to the Road Traffic Law 2008- Hanoi Law University, (2015), *Textbook on Legal Document Drafting*, Justice Publishing Company.

- **The objective aspect of the crime**

Objective behavior: This refers to the behavior of road traffic participants that violates road traffic regulations. Participation in road traffic involves operating road vehicles or other actions involved in road traffic⁴. Violations of road traffic participation regulations occur when individuals do not comply with or fully adhere to road traffic safety regulations. Therefore, determining violations of road vehicle operation regulations must not only be based on the provisions of the The Criminal Code but also the regulations stipulated in the Law on Road Traffic and the guiding documents issued by competent authorities. For instance, in the example above, A did not fully comply with traffic safety regulations when operating a motorcycle, such as adhering to the correct speed and staying in the correct lane. A's speeding was against regulations and safety rules set by law, leading to a loss of control and causing an accident.

For the offense of violating road traffic regulations, the act of violating road traffic safety regulations can only occur on roadways, including roads, bridges, tunnels, and road ferry terminals⁵. If the traffic participation behavior causing a fatal accident occurs outside the road space, it does not constitute the objective behavior of this crime.

Consequence: The offense of violating road traffic regulations is a material crime. Therefore, the occurrence of consequences is a mandatory sign of the constitution of this crime. If the act of violating road traffic control regulations has not yet caused harm to life or serious damage to the health or property of others, it does not constitute a crime, except in cases specified in Article 260.4 of The Criminal Code⁶. Thus, in the accident caused by A mentioned above, the consequence of Ms. N's death is the loss of life as stipulated by law.

Causation: The act of a road traffic participant violating road traffic regulations is the direct cause leading to consequences that damage the property, health, or life of others. If the damage is not caused by the act of violating road traffic regulations, it does not constitute the offense of violating road traffic regulations.

- **Subjective aspect of the crime**

The offense of violating road traffic regulations is committed through negligence, either due to overconfidence or carelessness.

Negligence due to overconfidence occurs when the violator of road traffic regulations, despite recognizing that their actions could lead to serious societal consequences, believes that these consequences will not occur or can be prevented.

Negligence due to carelessness occurs when the violator of road traffic regulations does not anticipate that their actions could lead to serious societal consequences, even though they should have foreseen and could have foreseen those consequences.

For example: In the accident caused by A, assuming that A was speeding because he trusted his driving skills, believed he was on a familiar road, and thought nothing unfortunate would happen, but in reality, he lost control and crashed into the rear of Ms. N's vehicle, resulting in her death. Therefore, A's fault in this case is negligence due to overconfidence⁷. Distinguishing between

⁴ Ho Chi Minh City University of Law, (2023), *Textbook of Vietnamese Criminal Law (Part on Crimes - Volume 2)*, Hong Duc Publishing Company, p.121.

⁵ Article 3 Road Traffic Law of 2008.

⁶ Article 260.4 of The Criminal Code 2015: "If a road traffic offence poses a threat to life, health or property of other people and is not promptly prevented, the offender shall be liable to a fine of from VND 10,000,000 to VND 50,000,000 or face a penalty of up to 01 year's community sentence or 03 - 12 months' imprisonment". With this provision, the actual consequences are not mandatory indicators of the crime, and the penalties are also lighter compared to the basic constituent of the offense as stipulated in Clause 1 of this Article.

⁷ Determining negligence due to overconfidence or negligence due to carelessness in this case is purely theoretical and holds no value in determining the criminal offense. In the theory of criminal determination, it is only necessary

negligence due to overconfidence or negligence due to carelessness, in this case, is merely theoretical and holds no value in determining the criminal offense.

- **Perpetrators of the offense**

The perpetrators of the offense of violating road traffic regulations are individuals aged 16 and above, who possess the cognitive and behavioral control capabilities. Individuals aged 14 to under 16 are not criminally liable for this offense because it is committed through negligence and does not fall under the criminal offenses for which individuals aged 14 to under 16 are criminally responsible as stipulated in Article 12.2 of The Criminal Code. Road user means operator or user of a vehicle joining in road traffic; person guiding or driving animals and pedestrian walking on the road. drivers, users of road vehicles; animal drivers, handlers; pedestrians on the road⁸.

Therefore, in the case of the accident caused by A, if A was not yet 16 years old at the time of the accident involving Ms. N, then A would not be criminally responsible⁹.

2. Limitations in the technical presentation of Article 260 of The Criminal Code 2015 and recommendations for improvement

Firstly, Clause 1, Article 260 of the Criminal Code stipulates: "Anyone who participates in road traffic and violates road traffic safety regulations causing damage to others in one of the following cases..." and then specifies the framing circumstances from points a to d. The phrase "causing damage to others" is considered unclear by the author group. What kind of damage is referred to here? Legally, damage can be understood as loss of life, health, honor, dignity, reputation, property, or other legitimate rights and interests of individuals; the property, honor, and reputation of legal entities or other subjects protected by law. The damage from points a to d, as stipulated in Clause 1, Article 260 of the Criminal Code, reflects the meanings above, i.e., damage to the life, health, and property of others. Theoretically, Article 260 of the Criminal Code defines an offense with material elements, meaning that the consequences in the objective aspect of the offense are mandatory signs for determining the crime. The provision "causing damage to others" is vague, unclear, and does not fully encompass the intended meaning, which is a limitation in the legislative drafting technique, specifically the lack of scientific precision in the use of language¹⁰.

Therefore, to clarify this provision, it is necessary to amend and supplement the wording in Clause 1. Accordingly, Clause 1, Article 260 of the Criminal Code should be revised as follows: "Anyone who participates in road traffic and violates road traffic safety regulations causing damage to the life, health, or property of others in one of the following cases..."

Secondly, point a Clause 1, Article 260 of the Criminal Code stipulates the framing circumstance as "causing death" meaning that anyone who participates in road traffic and violates road traffic safety regulations resulting in death shall be fined from 30 million VND to 100 million VND, subjected to non-custodial reform for up to 3 years, or imprisoned for 1 to 5 years. How should the circumstance "causing death" be understood? How many deaths does this imply? Meanwhile, Clauses 2 and 3 of this article also have aggravating circumstances involving causing death, but they specifically state the number of deaths: point đ of Clause 2 stipulates "causing the death of 2

to establish whether the behavior is negligent or not. If it is, whether it is negligent or intentional is a sufficient indication for prosecution.

⁸ Article 3.22 of Law on Road Traffic 2008.

⁹ However, criminal responsibility may be imposed on other subjects and is not addressed in this article.

¹⁰ According to Professor Nguyen Ngoc Hoa's perspective, the technique of drafting legal normative documents includes logical structure in document layout and scientific precision in language use - Nguyen Ngoc Hoa, *General Part of the Criminal Code 2015 from the perspective of presentation technique*, Journal of Legal Studies No. 1/2021, p.69.

people" and point a of Clause 3 stipulates "causing the death of 3 people". This analysis shows that the increase in the number of deaths from Clause 2 to Clause 3 corresponds to the rise in the framing value of this crime. This means that if Clause 2 refers to 2 deaths and Clause 3 refers to 3 deaths, it would logically follow that Clause 1 should refer to 1 death. The inconsistency in the use of terminology within the same article, confusing readers, also highlights the limitations and lack of scientific precision in the use of language, as previously analyzed in Clause 1 above. Therefore, for scientific accuracy and better logic, the provision at point a, Clause 1, "causing death" should be revised to "causing the death of 1 person".

Thirdly, currently, the framing circumstances in Clause 2, Article 260 of the Criminal Code are as follows:

"2. This offence committed in any of the following cases shall carry a penalty of 03 - 10 years' imprisonment:

- a) The offender does not have a driving license as prescribed;
- b) The offender is under the influence of alcohol and with blood or breath alcohol content above the limit, or under the influence of drugs or other strong stimulants banned by law;
- c) The offender leaves the site after the accident to evade responsibility or fails to help the victim;
- d) The offender fails to comply with the traffic controller's commands;
- đ) The offence results in the death of 02 people;
- e) The offence results in bodily harm to 02 people, each of whom suffers from 61% physical disability or more;
- g) The offence results in bodily harm to ≥ 03 people who suffer from a total physical disability of 122% - 200%;
- h) The offence results in property damage of from VND 500,000,000 to under VND 1,500,000,000".

The provisions from points a to g are the framing circumstances of Clause 2, Article 260 of the Criminal Code. According to these provisions, it can be understood that the framing circumstances in point a: "Without a driving license as prescribed"; point b: "In a state of having used alcohol or beer with a blood or breath alcohol concentration exceeding the prescribed limit, having used drugs or other strong stimulants"; point c: "Fleeing to evade responsibility or intentionally not assisting the victim" have the same or equivalent legal value as the circumstance in point đ: "Causing the death of 2 people"; point e: "Causing injury or harm to the health of 2 or more people with a total body injury rate of these people from 122% to 200%"; and point g: "Causing property damage from 500,000,000 VND to under 1,500,000,000 VND".

This provision should be understood as follows: the circumstances from points a to d of Clause 2 are additional, conditional circumstances that, when combined with the circumstances stipulated in Clause 1, elevate the offense to a more severe level as described in Clause 2. This means that if the offender has caused the consequences specified in points a to d of Clause 1 and now there is one additional circumstance from points a to d of Clause 2, the offense becomes more severe and falls under Clause 2. Therefore, points a to d of Clause 2 are not framing circumstances in the true sense but rather additional conditional circumstances as analyzed above. The framing circumstances stipulated in Clause 2, Article 260 of the current Criminal Code reflect a need for a more logical structure in the presentation, obscures the meaning of the law and makes it difficult to understand. Therefore, to make the law clear and logical, Clause 2 should be revised as follows:

"2. The offense falls under one of the following cases shall be punished with imprisonment from 03 years to 10 years:

- a) Causing the death of 02 people;
- b) Inflicting injury or harm to the health of 02 or more people with a total body injury rate of these individuals from 122% to 200%;
- c) Causing property damage from 500,000,000 VND to under 1,500,000,000 VND;

d) Causing any of the damages from point a to point d of this clause one and falling under one of the following cases: driving without a license as prescribed; in a state of alcohol or beer consumption with blood or breath alcohol concentration exceeding the prescribed limit, or using drugs or other potent stimulants; fleeing to evade responsibility or intentionally not aiding the victim, or failing to comply with the orders of the traffic controller or traffic guidance”.

Fourthly, Clause 3 of Article 260 of the Criminal Code stipulates:

"3. Offenses falling under one of the following cases shall be punished with imprisonment from 07 years to 15 years:

- a) Causing the death of 03 or more people;
- b) Inflicting injury or harm to the health of 03 or more people with a total body injury rate of these individuals 201% or more;
- c) Causing property damage of 1,500,000,000 VND or more"

It can be observed that the framing circumstances from point a to point c of this clause correspond to the damages as consequences caused by the offender, and these consequences pose a higher level of danger compared to Clause 2. However, in Clause 2, besides the framing circumstances understood as consequences stipulated from point d to point g, similar to those from point a to point c of this clause, it also includes additional circumstances from point a to point d of Clause 1, meaning additional circumstances as analyzed in the third limitation above. Therefore, the fact that Clause 3 does not regulate these additional circumstances, similar to Clause 2, is another limitation in the legislative drafting technique. To address this limitation, based on the amendments and supplements made to Clause 2 of Article 260 of the Criminal Code as above, the provision in Clause 3 needs to be revised as follows:

"Offenses falling under one of the following cases shall be punished with imprisonment from 07 years to 15 years:

- a) Causing the death of 03 or more people;
- b) Inflicting injury or harm to the health of 03 or more people with a total body injury rate of these individuals 201% or more;
- c) Causing property damage of 1,500,000,000 VND or more;
- d) Causing any of the damages from point a to point c of Clause 2 of this article and falling under one of the following cases: driving without a license as prescribed; in a state of alcohol or beer consumption with blood or breath alcohol concentration exceeding the prescribed limit, or using drugs or other strong stimulants; fleeing to evade responsibility or intentionally not aiding the victim, or failing to comply with the orders of the traffic controller or traffic guidance".

Conclusion

The offense of violating road traffic regulations under Article 260 of The Criminal Code 2015, amended and supplemented in 2017, serves as the legal basis for criminal prosecution of individuals whose traffic participation behaviors violate traffic safety regulations, resulting in very serious consequences. In road traffic accidents with criminal indicators, Article 260 of The Criminal Code 2015 is the most commonly applied. To ensure logical and scientific coherence in legal presentation and potential uniform application of the provisions of Article 260 of The Criminal Code 2015, based on the limitations highlighted in the article, it is hoped that competent authorities will promptly amend and supplement to perfect this law.

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USE OF BIOMARKERS IN PHYSICALLY ACTIVE INDIVIDUALS AND ATHLETES

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Abstract

Biomarkers are different types of biomolecules, used as indicators to assess the health status and benefits of individuals engaged in recreational physical activity or sport-persons such as athletes. Their use for the assessment of the health and beneficial impact of the physical activity and sports is of prior importance to prevent the risks and chronic medical conditions related to inactivity, sedentarity or health problems caused by bad/over or inappropriate exercising in the case of athletes.

A wide search was made in some of the most prestigious online scientific platforms (Web of Science, PubMed, Medline), using specific keywords related to the topic and filters for the level of citations and publication time (the last 15 years). From the 78 papers collected, 49 were selected for the preparation of the mini-review.

Various types of biomarkers (biochemical, physiological, etc.), in conjunction with genetic factors play an important role not only for general human health, but also in the context of the health effects of physical activity and sports, the biological response to physical activity and in the context of the prevention of diseases arising from sedentary life or the treatment of existing ones related or not to biological and physical aging. The biomarkers used for this purpose vary upon the context and specific purpose for using BM-s in physically active persons or athletes.

The set of markers analyzed in these subjects vary widely from the context and purpose of the studies: for example for research purposes, for tracking exercise and the biological response to exercise, for monitoring of the performance changes or purely to check and prevent risks from poor or excessive training.

Hence, the use of biochemical and physiological markers presents limitations related to their sensitivity, the need to use many of them for the above purposes, the lack of reference values for groups engaged in physical activity and sports, and others. In this context, the exploration of the genetic basis and hereditary factors, in collaboration with the above, takes also special importance for the purpose of this paper.

Key words: athletes, biomarkers, exercise response, genetic factor, health, physical activity.

**EVALUATION OF THE EFFICACY OF HOLMIUM: YAG LASER AND THULIUM
FIBER LASER IN THE TREATMENT OF URINARY SYSTEM STONES**

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Purpose

Holmium:yttrium-aluminum-garnet (Ho:YAG) laser has become the gold standard for laser lithotripsy in the last 20 years. However, Thulium Fiber Laser (TFL) has been introduced for lithotripsy and effective results have been achieved.

In this study, our aim is to present the data of retrograde intrarenal surgery (RIRS) performed with Thulium Fiber Laser (TFL) and Holmium:YAG (Ho:YAG) laser in the Department of Urology at Gazi University Faculty of Medicine over the past year.

Materials and Methods

The TFL used in this study was provided to our clinic within the scope of the Gazi University Scientific Research Project. Data from 94 patients who underwent retrograde intrarenal surgery (RIRS) due to kidney stones by the same surgical team at the Department of Urology, Gazi University Faculty of Medicine, between March 2023 and March 2024, were retrospectively evaluated. Data on stone location, stone size, lithotripsy duration, access sheath, stone-free status, and the laser power source used were analyzed.

Results

47 patients underwent lithotripsy with Ho:YAG laser, while 47 patients underwent lithotripsy with TFL. There were no statistically significant differences between the two groups in terms of age, gender, side, stone quantity, access sheath, stone-free status, and stone location (respectively; $p=0.771$, $p=0.139$, $p=0.885$, $p=0.330$, $p=ns$, $p=0.118$, $p=216$). When stone size was considered as smaller or larger than 2 cm, a statistically significant difference was found in favor of TFL ($p=0.001$). Moreover, the mean stone size was statistically significantly larger in the TFL group

($p < 0.001$). Regarding lithotripsy duration, the duration was statistically significantly shorter in the Ho:YAG laser group ($p = 0.017$) (Table 1).

Conclusion

Despite performing lithotripsy on larger stones in the TFL group, the lack of difference in stone-free rates compared to Ho:YAG laser, and the shorter lithotripsy durations despite a higher stone burden, highlight the TFL as a method with broader applicability and a preferable option in stone surgery due to its high efficacy and reduced need for additional surgical sessions. Although the surgical duration was longer for TFL in this study, it should be noted that the stone size was approximately 2 times larger in the TFL group.

Keywords: Ho:YAG, TFL, Lithotripsy

**UNLEASHING INNOVATION: EXPLORING THE LANDSCAPE OF OPEN
INNOVATION CONCEPTS AND TECHNIQUES**

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Abstract

Henry Chesbrough's seminal work, "Open Innovation: The New Imperative for Creating and Profiting from Technology," published in 2003, introduced the concept of open innovation (OI) as a transformative approach to corporate research and development. This paper aims to provide a comprehensive overview of OI, focusing on its evolution, key methods, and techniques as depicted in scholarly literature.

The review begins with a succinct elucidation of the concept of OI, tracing its development since Chesbrough's pioneering work. Subsequently, it delves into an exploration of various OI methods and techniques employed by firms, including crowdsourcing, co-creation, user innovation, open source innovation, and external technology scouting. Each method is scrutinized for its advantages, drawbacks, and exemplified with real-world instances of successful application.

Methodologically, the review adopts a systematic approach, conducting an exhaustive search across academic and practitioner literature to identify and evaluate pertinent studies on OI methods and techniques. Additionally, it addresses the challenges confronting organizations in OI implementation, particularly cultural and structural barriers.

The findings of this review offer valuable insights for both researchers and practitioners interested in OI. They contribute to a nuanced understanding of the diverse OI methods and techniques, their respective merits, limitations, and the impediments encountered during implementation. Ultimately, the study underscores that while OI presents significant opportunities for innovation, its effective deployment necessitates careful selection of methods and the cultivation of a conducive organizational environment.

Keywords: Open innovation, Innovation techniques, Collaboration

ANİMASYON ARAÇLARININ FEN ÖĞRETİMİNDE KULLANIMI: FEN BİLİMLERİ ÖĞRETMENLERİNİN GÖRÜŞLERİ

THE USE OF ANIMATION TOOLS IN SCIENCE EDUCATION: VIEWS OF SCIENCE TEACHERS

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ÖZET

Karmaşık kavramların öğrencilere daha anlaşılır şekilde sunulabilmesi için görsel ve interaktif materyalleri kullanma potansiyeline sahip derslerin başında Fen bilimleri dersi gelmektedir. Bu nedenle, animasyon teknolojilerinin fen öğretimindeki etkinliğini araştırmak, öğretmenlerin bu araçları nasıl değerlendirdiğini ve kullandığını anlamak büyük önem taşımaktadır. Son yıllarda dijital araçların eğitimdeki rolü büyük bir dönüşüm geçirmekte olup, öğretmenlerin bu yeni araçlar karşısındaki adaptasyon süreçleri ve yeterlik algıları da eğitim kalitesini doğrudan etkileyebilmektedir. Buradan hareketle bu araştırmanın amacı animasyon araçlarının fen öğretiminde kullanımına ilişkin fen bilimleri öğretmenlerinin görüşlerini tespit etmektir. Bu amaç doğrultusunda çalışma, yüksek lisans eğitimi sürecinde Animasyon Destekli Fen Öğretimi seçmeli dersini alan 14 fen bilimleri öğretmeni ile yürütülmüştür. Çalışma nitel araştırma yönteminin olgubilim (fenomenoloji) deseni kullanılarak gerçekleştirilmiştir. Çalışmanın verileri araştırmacılar tarafından hazırlanan görüşme formu ile toplanmıştır. Katılımcılardan elde edilen veriler içerik analizi ile kod, kategori ve temalar oluşturularak çözümlenmiştir. Elde edilen sonuçlara göre fen bilimleri öğretmenlerinin çoğu animasyon araçlarının fen bilimleri öğretiminde kullanılması gerektiği düşüncesini savunmaktadır ve öğretmenlerin büyük bir kısmı kendini animasyon araçlarını kullanma bakımından orta seviyede yeterli görmektedir. Ayrıca öğretmenlerin öğretmen yeterlikleri, teknolojik gelişmelerin hız kazanması ve öğrenci faktöründen dolayı eğitimcilerin animasyon araçları hakkında bilgi sahibi olması gerektiğini vurguladıkları, bunun için de hizmet öncesi eğitim, hizmet içi eğitimin önemi üzerinde durulması gerektiği yönünde görüş bildirdiği tespit edilmiştir. Bu bağlamda çalışmanın sonuçları alanyazın ile benzerlik ve farklılık açısından karşılaştırılmış olup elde edilen sonuçlar ve alanyazın temel alınarak öneriler sunulmuştur.

Anahtar Kelimeler: Animasyon araçları, fen öğretimi, içerik analizi, olgubilim

ABSTRACT

Science instruction stands as a forefront discipline benefiting from the potential use of visual and interactive materials to convey complex concepts in an understandable manner. Therefore, investigating the effectiveness of animation technologies in science education and comprehending how teachers assess and employ these tools is of significant importance. In recent years, the role of digital tools in education has undergone profound transformations, impacting the adaptation processes and self-perceived competencies of teachers, which directly influence the quality of education. This study aims to identify science teachers' perspectives on the use of animation tools in science instruction. Conducted within the context of a master's program, this research involved 14 science teachers who enrolled in the elective course "Animation-Assisted Science Teaching". Employing a qualitative research method, specifically the phenomenological design, the study gathered data through a semi-structured interview form prepared by the researchers. Analysis of the data from participants was carried out using content analysis, which involved coding, categorization, and thematization. The findings suggest that most science teachers advocate for the implementation of animation tools in science education, and many perceive themselves as moderately competent in using these tools. Additionally, it was noted that due to teacher competencies, accelerated technological advancements, and student-related factors, educators need to be knowledgeable about animation tools. The importance of pre-service and in-service training was emphasized in this context. The outcomes of this study have been compared with the existing literature for similarities and differences, leading to recommendations based on the results and reviewed literature.

Keywords: Animation tools, science instruction, content analysis, phenomenology

GİRİŞ

Alışıl gelmiş sistemlerden uzaklaşma, teknolojik gelişmelerle beraber hız kazanmış olup ülkeler arasındaki rekabeti artırırken aynı zamanda ülkelerin önceliği haline de gelmiştir. Ülkelerin gelişmişliğinde teknolojik ilerlemeler ölçüt olarak kabul edilmektedir (Ayvaci ve Bebek, 2018). Bu ölçüt eğitim alanında da etkili olmuştur (Curacı, 2021). Nitekim içinde bulunduğumuz çağın gerekleri doğrultusunda yetiştirecek olan yeni nesillerin gelişmişliğin ölçütünü ileri noktaya taşımaları beklenmektedir. Bunun için de nitelikli öğretmenlerin sahada söz sahibi olması önem arz etmektedir (Göker, 2021). Çünkü yeni nesillerin başarısını belirleyen kıstas öğretmenlerin donanımıdır (Çakmak ve Civelek, 2013; Darling-Hammond, 2000). Bu sebeple öğretmenlerin derslerinde teknolojiye karşı bakış açıları önemlidir. Teknolojinin eğitime aktarımında eğitim paydaşlarının teknolojiye olan tutumu, teknoloji kullanımı ve teknolojik yenilikleri öğrenmedeki gayretleri ve yeterlikleri; öğrencilerin teknoloji kullanımına karşı tutum ve teknolojiyi kullanma becerilerini etkileyeceği aşikârdır (Ertmer, 2005; İzci ve Eroğlu, 2016). Bu sebeple teknolojinin eğitime aktarımında öğretmenlerin bakış açısının belirlenmesi, öğretmenlerin teknolojiye dönük tutumlarını iyileştirmek ve geliştirmek adına önemlidir. Öğretmenlerin teknoloji kullanımına yönelik yapılan araştırmaların sayısında artış gözlenmiş olup çoğu araştırmalarda öğretmenlerin teknolojiye karşı olumsuz baktığı (Dargut ve Çelik, 2014; Şahin ve Arslan Namlı, 2019) bu sebeple de teknolojiyi eğitime aktarma noktasında yetersiz kaldıklarını göstermektedir (Kayaduman, Sırakaya ve Seferoğlu, 2011; Seferoğlu, 2009).

Öğretmenlerin teknolojiye karşı ön yargılı olmalarında teknolojiyi kullanma ile ilgili tecrübe eksikliği etkili olabilir. Nitekim yakın geçmişe kadar teknolojik ekipmanların pahalı olması, bu araçların sınıf ortamına taşınmasında çıkan güçlükler, konuların yoğunluğu ve öğretim materyallerine entegrasyonu noktasındaki eksikler bu önyargının oluşmasında etkili olmuş olabilir. Oysa günümüzde teknolojik gelişmeler ve buna bağlı olarak teknolojik araçlardaki fiyat düşüşü (McGrath ve Brown, 2005), bireyselleşmiş öğrenmeyi ön plana çıkaran ses, grafik, efekt gibi bir

çok hareketli materyal olarak ifade edilen animasyon araçlarını (Lin, 2011) popüler hale getirmiş ve bu araçlar sınıf ortamına kolay bir şekilde entegre olmuştur. Ayrıca yakın geçmişte yaşanan küresel sorun koronavirüs salgını da eğitime teknoloji entegrasyonunu zorunlu kılmıştır (Bozkurt, 2022; Gündüzalp ve Yıldız, 2020). Bu durum da öğretmenleri önyargıları ile yüzleşmeye itmiştir.

Öğretmenlerden derslerinde öğrencilerin dikkatini çekecek şekilde beş duyu organını işin içine katacak bir yöntemi kullanması, soyut olan konuları somutlaştırması ve bunları da teknolojik araçları kullanarak gerçekleştirmesi beklenen bir özelliktir. Nitekim animasyon araçları sayesinde dersler daha zevkli hale gelmekte, geleneksel sıkıcı sınıf ortamından eğlenceli yenilikçi eğitim ortamına dönüşmektedir (Steven ve Phillip, 1994). Böylece animasyon araçları ile öğrenciler için zengin öğrenme oluşturulurken (Arıcı ve Dalkılıç, 2006) öğretmenlerin de işini kolaylaştırdığı söylenebilir.

Eğitimde Powerpoint, Visme, Canva, Algodoo, Storyboard That, Chatterpix gibi web 2.0 araçları animasyon oluşturmada kullanılmaktadır. Nitekim bu araçlarla yapılacak animasyonların basit şekilde düzenlenebilir olması (Kahraman, 2013; Teke, 2010), çoklu duyuya hitap etmesi gerekir. Bu araçlar özellikle fen bilimleri dersi için bilgilerin günlük hayata entegre edilmesinde önemlidir (Mundilarto, 2013). Animasyon destekli fen öğretimi ile öğrencilerin soyut konuları somutlaştırıp kalıcı öğrenmeyi gerçekleştirmesi mümkün hale gelecektir. Ayrıca öğrenciler bu öğrenme araçlarını kullanarak öğrenmeye karşı motivasyonlarını, özgün düşünebilme becerilerini artırabilir (Aisyah, Widiyanto ve Fatkhurrohman, 2018).

Alanyazında yer alan çalışmalarda animasyonla eğitimin öğrenci başarısına etkisi (Akdoğan, 2019; Banda ve Nzabahimana 2023; Boushah Azzaroulli 2019; Boyacı, 2016; Daşdemir, vd., 2013; Göktürk, 2015; Şimşek, 2017; Uzuner ve Çakır, 2019); animasyonla işlenen derslerin bilginin kalıcılığı ve özgüven üzerindeki etkisi (Kearsley, 2002); geliştirilen öğretim materyallerinin öğrencilerin özgün düşünme becerileri ve öz kavramlarına etkisi (Sayan ve Hamurcu, 2018); tasarım temelli STEM öğreniminin öğrencilerin STEM özgün fikir ve epistemik inançları üzerindeki etkisi (Wan, So ve Zhan, 2023); simülasyon kullanılarak desteklenen bilgisayar destekli öğretimin öğrencilerin bilimsel süreç becerilerine etkisi (Saputri, 2021); bilgisayar destekli tasarım ve animasyon-simülasyon eğitimi alanındaki problemlere karşı akademisyenlerin bakış açısı (Bağcı ve Başaran, 2019); animasyon ve simülasyon araçlarının eğitimde kullanılmasına yönelik öğretmen görüşlerini belirleyen çalışmalar (Ben Ouahi, vd., 2022; Prasetya, vd., 2022; Yılmaz, 2019) mevcuttur.

Alanyazın taraması sonucunda fen bilimleri öğretmenlerinin fen öğretiminde animasyon kullanımına ilişkin görüşlerine sınırlı sayıda yer verildiği görülmüştür. Oysa yakın geçmişte yaşanan koronavirüs salgını teknolojinin eğitime entegrasyonunu hızlandırmış olmakla birlikte öğretmenlerin teknoloji kullanımına dair önyargılarını gün yüzüne çıkarmıştır. Bu sebeple bu çalışmada fen bilimleri öğretmenlerinin fen öğretiminde animasyon araçlarını kullanmalarına yönelik bakış açılarını ortaya koymak hedeflenmiştir. Buradan hareketle çalışmanın amacı doğrultusunda “fen öğretiminde animasyon araçlarının kullanımına ilişkin fen bilimleri öğretmenlerinin görüşleri nasıldır?” sorusuna cevap aranmıştır.

YÖNTEM

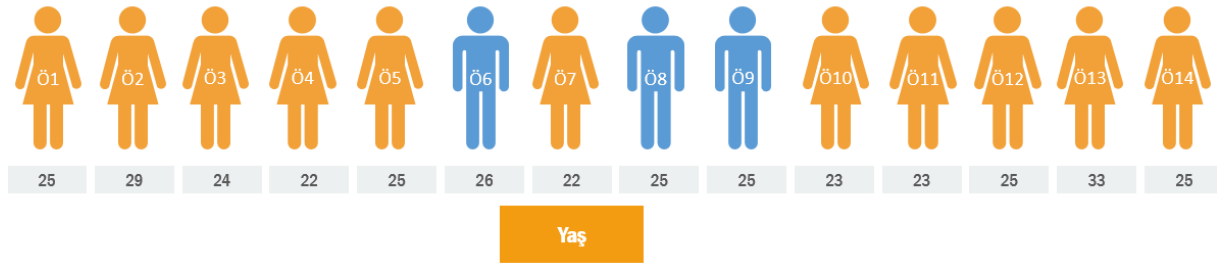
Bu çalışmada nitel araştırma yöntemi olan fenomenoloji (olgubilim) deseni kullanılmıştır. Nitekim olgubilim farkında olduğumuz ama derinlemesine bir anlayışa sahip olmadığımız bir olgu ya da duruma yönelik niçin, nasıl gibi sorularla derin, detaylı ve bütüncül bir bakış açısı oluşturmak için kullanılan bir desendir (Creswell, 2019; Creswell, 2021).

Çalışma Grubu

Bu çalışma lisansüstü eğitiminde seçmeli olarak alınan “Animasyon Destekli Fen Öğretimi” dersine çeşitli uygulamalar yaparak katılım gösteren 14 fen bilimleri öğretmenleri ile yürütülmüştür. Çalışma grubu amaçlı örneklemelerden ölçüt örneklem türüne göre oluşturulmuştur. Çalışma grubunun belirlenmesinde dikkate alınan ölçütler şunlardır:

- Fen bilimleri öğretmeni olması,
- Animasyon destekli fen öğretimi dersine katılmış olması
- Katılımcı gönüllülüğü

Katılımcılara ait demografik bilgiler Şekil 1’de sunulmuştur.



Şekil 1. Katılımcılara ait demografik bilgiler

Çalışma grubunun büyük çoğunluğunu (f:11) kadınların oluşturduğu görülmüş olup fen bilimleri öğretmenlerinin çoğunun (f:6) 25 yaşında oldukları tespit edilmiştir. Bu çalışmaya katkı sağlayan fen bilimleri öğretmenlerinin yaşlarının 22 ile 33 yaş aralığında değiştiği görülmüştür.

Veri Toplama Süreci ve Aracı

Bu çalışmada veriler çalışmanın amacı doğrultusunda oluşturulan sorular ve sonda sorulardan oluşan yapılandırılmış görüşme formundan elde edilmiştir. Görüşmenin yapılmasının amacı kişilerin bir olgu hakkındaki düşüncelerini tespit etmektir (Patton, 2002). Görüşme sorularını hazırlamadan önce araştırmacılar detaylı bir şekilde alanyazın taraması yapmıştır. Alanyazın taramasından sonra görüşme formu oluşturulup uzman görüşüne sunulmuştur. Eğitim alanında uzman akademisyenlerden alınan görüşler doğrultusunda bazı sorularda revizyon yapılmıştır. Örneğin “Animasyon destekli Fen öğretiminin öğrencilerin öğrenme ve anlama becerilerinde ne gibi değişiklikler meydana getirmesini beklersiniz?” sorusunun çalışmanın amacı ile örtüşmediği; bu soru ile animasyon destekli fen öğretiminin öğrencilerin öğrenmeleri ve öğretim süreçlerine etkisinin tespit edilmek istendiği düşünülerek, bu sorunun çıkarılmasına karar verilmiştir. Uzman görüşleri doğrultusunda oluşturulan görüşme formu katılımcılara uygun oldukları zaman aralığında gönderilmiştir. Katılımcılar herhangi bir müdahale olmadan görüşlerini yansıtmışlardır. Görüşme formunu katılımcıların doldurması ile veri kaybının önüne geçilmek istenmiştir. Nitekim araştırmacıların sesli görüşme ile topladıkları verileri transkript ederken veri kaybı yaşaması ya da gözden kaçırdığı noktaların olması muhtemeldir. Katılımcıların isimleri gizli tutulmuş olup katılımcılar Ö1, Ö2, Ö3, ... Ö14 şeklinde kodlanmıştır.

Veri Analizi

Verilerin hazırlanması, verilerden kodların çıkarılması, kodların bütünleştirilerek temaların oluşması sonucu elde edilen bütüncül yapının tablo ya da şekil olarak ifade edildiği analizler nitel

araştırmalarda kullanılmaktadır (Creswell, 2020). Buradan hareketle bu çalışmada elde edilen veriler içerik analizi ile analiz edilmiştir.

Geçerlik ve Güvenirlik

Geçerlik doğru bilgiye ulaşmak için gerekli önlemlerin alınması iken güvenilirlik ise verilerin başka araştırmacılar tarafından da analiz edilebilecek şekilde açık ve detaylı verilmesi olarak ifade edilmiştir (Yıldırım ve Şimşek, 2016, s.284). Bu araştırma alanyazında yer alan bazı çalışmaları (Brantlinger, vd., 2005, s.201; Creswell, 2020, s. 254) temel almış olup geçerlik ve güvenilirlik ölçütleri şu şekilde sunulmuştur:

- Araştırmacının sahada katılımcılar ile uzun süre etkileşim halinde bulunması,
- Verilerin katılımcıların kendisinden doğrudan alıntı yapılması
- Yöneltilen sorular ile derinlemesine veri oluşturma,
- Verileri dikkatli saklama,
- Verileri detaylı bir şekilde tasvir etme,
- Verileri rapor ederken nesnellığı korumadır.
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BULGULAR

“Fen Öğretiminde Animasyon Araçları Kullanımına Yönelik Düşünceler” Temasına İlişkin Bulgular

Bu bölümde lisansüstü eğitiminde ders alan fen bilimleri öğretmenlerinden “Fen öğretiminde animasyon araçlarının kullanımı hakkında düşünceleriniz nelerdir?” sorusu ile toplanan veriler sunulmuştur.

Tablo 1. Fen Öğretiminde Animasyon Araçları Kullanımına Yönelik Düşüncelere İlişkin Öğretmen Görüşleri

Kategoriler	Kodlar	Katılımcılar	f
Olumlu Düşünceler	Olumlu Etki Sağlama	Ö1, Ö12, Ö13, Ö14	4
	Önemli Bulma	Ö1	1
	Çok Avantajlı Olma	Ö10	1
Konuya Yönelik Düşünceler	Somutlaştırma	Ö4, Ö5, Ö7, Ö12	4
	Basitleştirme	Ö4, Ö7, Ö14	3
	Kalıcı Bilgi Sağlama	Ö9, Ö11	2
	Konuyu Detaylandırma	Ö1	1
	Hedeflerin Anlaşılabilirliğini Sağlama	Ö6	1
Araca Yönelik Düşünceler	Kullanımı Yaygınlaşmalı	Ö2, Ö3, Ö4, Ö8	4
	Dikkat Çekici Olması	Ö8, Ö10, Ö14	3
	Eğlenceli Olması	Ö8, Ö10	2
	Anlamlı Öğrenme Sağlama	Ö10, Ö12	2
Öğrenciye Yönelik Düşünceler	Motivasyonu Artırma	Ö9, Ö14	2
	Merak Uyandırma	Ö1	1
	Aktif Katılım Sağlama	Ö6	1
Öğretmene Yönelik Düşünceler	Önyargıyı Yıkma	Ö7	1
	Hizmet İçi Eğitim Verilmeli	Ö3	1

Tablo 1'e göre fen öğretiminde animasyon araçları kullanımına yönelik düşünceler teması altında “olumlu düşünceler”, “konuya yönelik düşünceler”, araca yönelik düşünceler” ve “öğrenciye yönelik düşünceler” şeklinde kategorilerin yer aldığı görülmüştür. Öğretmenlerin olumlu düşünceler kategorisini “olumlu etki sağlama”, “önemli bulma” ve “çok avantajlı olma” ile ilişkilendirdikleri görülmüştür. Konuya yönelik düşünceler kategorisini “somutlaştırma”, “basitleştirme”, “kalıcı bilgi

sağlama”, “konuyu detaylandırma” ve “hedeflerin anlaşılabilirliğini sağlama” kodlarıyla ilişkilendirildiği tespit edilmiştir. Araca yönelik düşünceler kategorisini “kullanımı yaygınlaşmalı”, “dikkat çekici olması” ve “eğlenceli olması” kodları ile ilişkilendirilmiştir. Öğrenciye yönelik düşünceler kategorisinin “anamlı öğrenme sağlama”, “motivasyonu artırma”, “merak uyandırma”, “aktif katılım sağlama” ve “önyargıyı yıkma” şeklinde kodlar ile ilişkilendirildiği görülmüştür. Ayrıca öğretmenlerin öğretmene yönelik düşünceler kategorisini de “hizmet içi eğitim verilmeli kodu ile ilişkilendirdiği tespit edilmiştir.

Fen öğretiminde animasyon araç kullanımına yönelik düşüncelerini farklı kategori ve kodlarla ifade eden öğretmenlerden Ö1’in “Fen öğretiminde animasyon araçlarının kullanımı fen öğretimi açısından oldukça önemlidir. Konunun daha ayrıntılı bir şekilde ele alınmasını, anlaşılmayan bir yerin anlatımında öncülük edip kolaylık sağlanmasını sağlar, Çeşitliliği artırarak öğrencinin dikkatini çekmeyi sağlayabilir. Bu şekilde öğrencilerin dikkatini çekerek öğrencide merak duygusunu da uyandırır. Animasyonla yapılan fen öğretiminde animasyon araçlarını kullanmanın olumlu etkilerinin olduğunu düşünüyorum.” şeklinde ifade ettiği tespit edilmiştir.

“Animasyon Araçları Kullanımına Yönelik Yeterlik Düzeyine Dair Görüşler” Temasına Yönelik Bulgular

Bu bölümde lisansüstü eğitiminde ders alan fen bilimleri öğretmenlerinden “Animasyon araçları kullanımı hakkında yeterliğiniz ne düzeydedir?” sorusu ile toplanan veriler sunulmuştur.

Tablo 2. Animasyon araçları kullanımına yönelik yeterlik düzeylerine ilişkin öğretmenlerin görüşleri

Kategoriler	Kodlar	Katılımcılar	f
Yeterlik düzeyi	Orta Seviyede	Ö1, Ö6, Ö7, Ö12, Ö13	5
	İyi Seviyede	Ö3, Ö4, Ö9, Ö11	4
	Orta Seviyenin Üzerinde	Ö2, Ö8	2
	Düşük Seviyede	Ö5, Ö10	2
	Üst Düzey Seviyede	Ö14	1

Tablo 2’ye göre, animasyon araçlarının kullanımına yönelik yeterlik düzeylerini farklı seviyelerle ilişkilendiren öğretmenlerin çoğunun (f:5) kendisini “orta seviyede” gördüğü, bir kısmının da “iyi seviyede” gördüğü tespit edilmiştir.

Animasyon araçları kullanımına yönelik yeterlik düzeyini Ö7 “Animasyon araçlarından powerpoint ve storyboard that kullanarak animasyon hazırlayabilirim. Ancak bu uygulamaların her ikisini de orta düzeyde kullanabiliyorum.” şeklinde ifade ederken Ö4 “İyi bir seviyede olduğumu düşünüyorum. Animasyon araçlarını etkili bir şekilde kullandığıma inanıyorum.” şeklinde düşüncelerini belirtmiştir.

“Animasyon Araçları ve Derslerde Kullanımına Yönelik Eğitimcilerin Bilgi Sahibi Olma Gerekliliği ve Alınması Gereken Eğitimler” Temasına Yönelik Bulgular

Bu bölümde lisansüstü eğitiminde ders alan fen bilimleri öğretmenlerinden “Animasyon araçları ve derslerde kullanımı ile ilgili eğitimcilerin bilgi sahibi olmalarının gerekliliği hakkında düşünceleriniz nelerdir?” sorusu ile toplanan veriler sunulmuştur.

Tablo 3. Animasyon Araçları Ve Derslerde Kullanımına Yönelik Eğitimcilerin Bilgi Sahibi Olma Gerekliliği ve Alınması Gereken Eğitimlere İlişkin Öğretmen Görüşleri

Kategoriler	Kodlar	Katılımcılar	f
Eğitimcilerin Bilgi Sahibi Olma Gerekliliği	Öğretmen Yeterliği	Ö1, Ö2, Ö4, Ö5, Ö7, Ö8, Ö9, Ö10, Ö12, Ö13, Ö14	11
	Teknoloji ile İlişkisi	Ö1, Ö7, Ö8, Ö10, Ö11, Ö12, Ö14	7
	Öğrenci Faktörü	Ö1, Ö3, Ö4, Ö7, Ö12	5
	Çağdaki Gelişmeler	Ö3	1
Hizmet Öncesi Eğitim (Lisans)	Yeni Ders Açılmalı	Ö1, Ö6, Ö7, Ö8, Ö9	5
	Animasyon Eğitimi	Ö2, Ö4, Ö10, Ö12	4
	Fen Öğrenme ve Öğretme Yaklaşımları	Ö3	1
	Fen Eğitimi Teknoloji Entegrasyonu	Ö5	1
	Öğretim Materyalleri	Ö13	1
Hizmet İçi Eğitim	Eğitim Verilmeli	Ö2, Ö3, Ö4, Ö6, Ö7, Ö8, Ö9, Ö10, Ö12, Ö13	10
	Belirtilmedi	Ö1, Ö5, Ö11, Ö14	4
	Teoriden Uygulamaya	Ö2, Ö4	2

Tablo 3'e göre animasyon araçları ve derslerde kullanımına yönelik eğitimcilerin bilgi sahibi olma gerekliliği ve alınması gereken eğitimler teması altında "eğitimcilerin bilgi sahibi olma gerekliliği", "hizmet öncesi eğitim (lisans)" ve "hizmet içi eğitim" olmak üzere üç kategori bulunmaktadır. Eğitimcilerin bilgi sahibi olma gerekliliği kategorisi altında "öğretmen yeterliği", teknoloji ile ilişkisi", öğrenci faktörü" ve "çağdaki gelişmeler" yer almaktadır. Hizmet öncesi (lisans) kategorisi altında "yeni ders açılmalı", "animasyon eğitimi", "fen öğrenme ve öğretme yaklaşımları", fen eğitimi teknoloji entegrasyonu" ve "öğretim materyalleri" kodları ile ilişkilendirildiği tespit edilmiştir. Hizmet içi eğitim kategorisi altında "eğitim verilmeli" ve "teoriden uygulamaya" kodları ile ilişkilendirildiği görülmüştür. Ayrıca dört kişinin bu kategori ile ilişkilendirme yapmadığı tespit edilmiştir.

Animasyon araçları ve derslerde kullanımına yönelik eğitimcilerin bilgi sahibi olma gerekliliği ve alınması gereken eğitimlere ilişkin düşüncesini belirten öğretmenlerden Ö12'ye göre "Kesinlikle gerekli olduğunu düşünüyorum. Lisans öğrencileri öğretmen adayları oldukları için, 'Animasyon Uygulamaları' adı altında bir ders açılacağı ve burada uygulamaların nasıl yapıldığı gösterdiği taktirde anlatacakları konulara bu öğrenilmiş bilgileri entegre ederek daha anlaşılır bir anlatım yapabileceklerdir. Bu sebeple yeni bir ders açılması hem öğrenen için bilgi düzeyi artışını hem de ileride karşılaşacağı öğrenciler için verimli ders anlatımının sağlanmasına katkıda bulunacaktır. Hizmet içi eğitimlere de ihtiyaç duyulduğunu düşünüyorum. Bunun sebebi herkes yeni mezun öğretmen olmadığı için, yaşları büyük olan öğretmenlerin teknoloji ilgisinin yeterli olmadığı için bu uygulamalar hakkında yeterli düzeyde eğitim verilerek onların gelişmesiyle öğrencilerinin gelişmesinin artacağını düşünüyorum" şeklinde düşüncesini ifade ettiği tespit edilmiştir.

TARTIRMA, SONUÇ VE ÖNERİLER

Animasyon Destekli Fen Öğretimi dersini alan fen bilimleri öğretmenlerinin fen öğretiminde animasyon araçlarını kullanımına yönelik görüşlerini ortaya çıkarmak amacıyla bu çalışmadan elde edilen veriler şu başlıklar halinde sunulmuştur:

- Fen öğretiminde animasyon araçları kullanımına yönelik düşüncelere ilişkin öğretmen görüşleri,
- Animasyon araçları kullanımına yönelik yeterlik düzeylerine ilişkin öğretmenlerin görüşleri,
- Animasyon araçları ve derslerde kullanımına yönelik eğitimcilerin bilgi sahibi olma gerekliliği ve alınması gereken eğitimlere ilişkin öğretmen görüşleri

Fen Öğretiminde Animasyon Araçları Kullanımına Yönelik Düşüncelere İlişkin Öğretmen Görüşleri

Fen eğitiminde animasyon araçları kullanımına yönelik düşüncelerin sorulduğu bu çalışmada öğretmenlerin olumlu düşünceler kategorisini “olumlu etki sağlama”, “önemli bulma” ve “çok avantajlı olma” ile ilişkilendirdikleri görülmüştür. Konuya yönelik düşünceler kategorisinin “somutlaştırma”, “basitleştirme”, “kalıcı bilgi sağlama”, “konuyu detaylandırma” ve “hedeflerin anlaşılabilirliğini sağlama” kodlarıyla ilişkilendirildiği tespit edilmiştir. Araca yönelik düşünceler kategorisi “kullanımı yaygınlaşmalı”, “dikkat çekici olması” ve “eğlenceli olması” kodları ile ilişkilendirilmiştir. Öğrenciye yönelik düşünceler kategorisinin “anamlı öğrenme sağlama”, “motivasyonu artırma”, “merak uyandırma”, “aktif katılım sağlama” ve “önyargıyı yıkma” şeklinde ifade edildiği görülmüştür. Ayrıca öğretmenlerin öğretmene yönelik düşünceler kategorisini de “hizmet içi eğitim” verilmeli şeklinde ilişkilendirdiği tespit edilen sonuçlardandır. Alan yazında yer alan bazı araştırmaların, öğretmenlerin teknoloji ile öğretim deneyimleri arasında orantısal olarak teknoloji entegrasyonuna yönelik olumlu düşüncelerinde artış olduğu görülmüştür (Ertmer, 1999; Ertmer ve Ottenbreit-Leftwich, 2010). Animasyonda ses, zaman ve görsel etkileşimin güçlü olmasının eğitime entegrasyonu açısından en iyi sonuçları vereceği belirtilmiştir (Lowe ve Mason, 2017). Genel olarak öğretmenlerin animasyon araçlarına yönelik düşüncelerinin olumlu olmasında bu araçların öğrencilerin anlamasını kolaylaştıran özelliklerinin olması, konu hedef bütünlüğünü sağlaması ve bu araçlarının kullanımının öğrenilmesi için hizmet içi eğitimin gerekli olduğu düşüncesinin etkili olduğunu ifade edebiliriz. Bu bağlamda gelecek çalışmalarda öğretmenlerin animasyon araçlarını derslerinde kullanma yeterlikleri ile öğrencilerin akademik başarısı arasındaki ilişki araştırılabilir.

Animasyon Araçları Kullanımına Yönelik Yeterlik Düzeylerine İlişkin Öğretmenlerin Görüşleri

Bu çalışmada animasyon araçlarının kullanımına yönelik yeterlik düzeylerini farklı seviyelerle ilişkilendiren öğretmenlerin çoğunun kendisini “orta seviyede” gördüğü, bir kısmının da “iyi seviyede” gördüğü tespit edilmiştir. Ancak bazı öğretmenlerin kendilerini animasyon araçlarını kullanabilme kapsamında “düşük seviye” şeklinde derecelendirdikleri görülürken bir kısım öğretmenlerin ise “üstün seviye” şeklinde derecelendirdikleri tespit edilmiştir. Alanyazında da benzer seviyelerin yer aldığı görülmektedir (Şentürk, 2017). Chan’ın (2013) çalışmasında yer alan bulgulara göre, Katılımcılar (%82,9) animasyonları öğretim için hiç kullanmadıklarını belirtmiştir. Bu duruma sebep olarak da kendi animasyonlarını üretmek için gerekli kaynaklara (örn. zaman) ve teknik donanımına sahip olmadıklarını belirttikleri görülmüştür. Bu çalışmada ise öğretmenlerin çoğunluğunun animasyon araçlarını kullanabilme kapsamında kendilerini orta seviye olarak derecelendirmesinde teknolojinin eğitime entegrasyonunun hızlanması ve bu hızda itici güç olarak koronavirus küresel salgınına gösterebiliriz. Nitekim ilerleyen süreçte öğretmenlerin animasyon araçlarını kullanabilme öz yeterliğini tespit edecek araç geliştirilebilir.

Animasyon Araçları ve Derslerde Kullanımına Yönelik Eğitimcilerin Bilgi Sahibi Olma Gerekliliği ve Alınması Gereken Eğitime İlişkin Öğretmen Görüşleri

Çalışmaya katılan öğretmenlerin çoğunun eğitimde animasyon araçları konusunda bilgi sahibi olma gerekliliğini “öğretmen yeterliği” ile ilişkilendirdiği bir kısmının teknoloji ile ilişkilendirdiği, bir kısmının ise “öğrenci faktörü” ile ilişkilendirdiği görülmüş olup sadece bir katılımcının “çağdaki gelişmeler” ile ilişkilendirdiği görülmüştür. Ayrıca katılımcılar öğretmenlerin animasyon araçlarını derste kullanma noktasındaki yeterliklerini artırmak için hizmet içi eğitim alması gerektiğini ve öğretmen adaylarının ise hizmet öncesi eğitim ile donanımlı hale gelmesi gerektiğini düşündükleri

tespit edilmiştir. Bu bağlamda hizmet öncesi eğitim kategorisini öğretmenlerin çoğunun “yeni ders açılmalı” ile ilişkilendirdiği, bazı öğretmenlerin “animasyon eğitimi” ile ilişkilendirdiği, sınırlı sayıdaki katılımcının ise “fen öğrenme ve öğretme yaklaşımları”, “eğitim teknolojileri entegrasyonu” ile ilişkilendirdiği tespit edilmiştir. Katılımcıların büyük çoğunluğunun öğretmenlere hizmet içi eğitim verilmesi gerektiğini düşündüğü tespit edilirken sınırlı sayıdaki katılımcının “teoriden uygulamaya” şeklinde hizmet içi eğitimlerin teorik bilgi aktarımından çok uygulamaya dönük olması gerektiği düşüncesini savundukları görülmüştür. Bu kategoride dikkat çeken diğer bir sonuç ise dört katılımcının görüş bildirmemiş olmasıdır. Hizmet içi eğitime ayrılan zamanın öğretmenlerin iş hayatları ile uyuşmaması öğretmenlerin görüş bildirmemesine yol açmış olabilir. Sonuç olarak öğretmenlerin çoğu, öğretmenlerin animasyon araçlarını kullanma noktasında yeterli olması gerektiğini, bu araçlarla ilgili bilginin hizmet içi öğrenme ya da hizmet öncesi öğrenme ile alınabileceğini savundukları görülmüştür. Nitekim alanyazında teknoloji ile ilgili bilgiyi kazanma noktasında hizmet içi eğitimin gerekliliğini vurgulayan birçok çalışmanın yer aldığını söyleyebiliriz (Buckenmeyer, 2011; Ertmer, 2005; Polly ve Orrill, 2016). Şentürk’ün (2017) yaptığı çalışmada da hizmet içi eğitimin teknoloji aktarımında önemli olduğunu ifade eden katılımcıların olduğu belirtilmiştir. Bu bağlamda uzaktan hizmet içi eğitimlere karşı öğretmen tutumlarının araştırılması önerilir.

Sonuç olarak öğretmenlerin fen öğretiminde kullanılan animasyon araçlarının olumlu katkı sağladığı yönünde bir düşünceye sahip oldukları görülmüştür. Görüşmeye katılan fen bilimleri öğretmenlerinin çoğunun animasyon araçlarını kullanma yeterlikleri ile ilgili olarak kendilerini orta yeterlikte gördüğü tespit edilmiştir. Ayrıca öğretmenlerin yeterlik noktasında bilgi sahibi olmaları gerektiği ve donanım eksikliği halinde hizmet içi eğitim alınması ve öğretmen adaylarının hizmet öncesinde eğitim almaları gerekliliğine vurgu yapılmıştır.

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ENVIRONMENTAL HAZARDS IN ALBANIA: CASE STUDY – SHKODRA REGION

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Abstract

This paper critically examines the environmental hazards in Albania, focusing specifically on the patterns of development of these hazards within the country, with a particular emphasis on the Shkodra region located in its northwest. The concept of “environmental hazard” is defined as any threat to human society that arises from natural or technological events that originate and are transmitted through the environment. This study categorizes these hazards into several types, including geological, atmospheric, hydrological, biophysical, and technological threats.

Utilizing a comprehensive review of existing scientific literature along with detailed analysis from a case study of the Shkodra region, this paper identifies earthquakes and floods as the predominant environmental hazards affecting both the national and regional levels. Additionally, the research highlights that other hazards such as landslides, avalanches, wildfires, epidemic diseases, and technological risks also play a significant role, albeit to a lesser extent.

The findings indicate that the consequences of these environmental hazards are not solely due to their natural occurrence but are significantly influenced by human vulnerability factors. These factors include rapid population growth, increasing urbanization, widespread poverty, unsustainable development practices, degradation of natural resources, inadequate infrastructure, and weak institutional capacity. In response to these challenges, the paper proposes a set of concrete recommendations aimed at minimizing the impacts of environmental hazards in Albania and the Shkodra region.

These recommendations focus on improving disaster preparedness and response mechanisms, enhancing adaptive capacities, and implementing sustainable environmental management practices. The goal is to foster a more resilient society that is better equipped to handle the challenges posed by environmental hazards through proactive adaptation and preparedness strategies.

Keywords: Environmental hazards, Albania, Shkodra region, vulnerability, adaptation

INTRODUCTION

Environmental hazards significantly threaten human societies, originating and propagating through environmental pathways (Smith & Petley, 2009). Albania, located in Southeast Europe, is particularly vulnerable to such hazards due to its geographical and climatic conditions. This paper focuses on the Shkoder region, analyzing the patterns and impacts of the 2019 earthquake and the 2010 floods, and aims to provide concrete recommendations for minimizing the effects of these hazards.

MATERIALS AND METHODS

This study is grounded in existing scientific literature and fieldwork. Data on environmental hazards in Albania were gathered from various sources, including government reports, academic journals, and field observations. The focus is specifically on the Shkoder region, significantly affected by natural disasters. The analysis integrates both quantitative and qualitative data to provide a comprehensive understanding of environmental hazards. Methods used include geographic information system (GIS) mapping, statistical analysis of hazard data, and interviews with local authorities and residents.

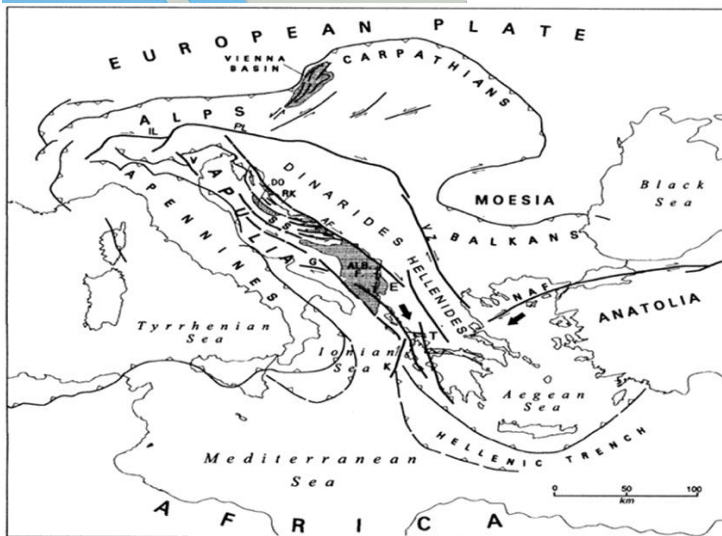


Figure 1. Physical map of Albania (Picha, 2002)

Figure 2. Map of Adriatic plate and its tectonics

RESULTS

Overview of Environmental Hazards

Environmental hazards encompass all potential threats to human society originating from the environment. These hazards can be categorized into natural hazards (geologic, atmospheric, hydrologic, biologic), technological hazards, and context hazards such as global environmental change. Natural hazards, including earthquakes, floods, storms, and wildfires, can have immediate and severe impacts on human life and infrastructure. Technological hazards, such as industrial accidents and dam failures, often result from human activities and can exacerbate the effects of natural events. Context hazards involve long-term environmental changes, including climate change, which can increase the frequency and severity of natural hazards.

Environmental Hazards in Albania

Albania, a small country in the western Balkan Peninsula, spans an area of 28,748 km² with a population of 2.9 million. Its natural landscape, characterized by mountainous terrain and extensive river systems, makes it particularly susceptible to environmental hazards. The country's Mediterranean climate further exacerbates the risk of flood hazards, especially during the rainy winter months.

Geographical and Climatic Context

Albania is bordered by Montenegro, Kosovo, North Macedonia, Greece, and the Adriatic and Ionian seas. The terrain is mostly mountainous, with an average elevation of 708 meters. The western plains, along the Adriatic coast, are the most fertile and densely populated areas, making them particularly vulnerable to environmental hazards. The Mediterranean climate in Albania, with mild, rainy winters and hot, dry summers, contributes to its susceptibility to floods during the winter months when most annual precipitation occurs. The river systems, including the Drin, Seman, Shkumbin, and Vjosë rivers, originate in the high mountains and flow through steep gorges before reaching the plains, posing significant flood risks.

Main Environmental Hazards

Albania faces various natural events with catastrophic potential, including geological hazards (earthquakes, landslides), hydrological hazards (floods), atmospheric hazards (storms, droughts), and biophysical hazards (wildfires, epidemics). Technological and ecological hazards, such as dam failures and climate change, also pose significant risks (UNDP, 2003)

Geological Hazards

Albania lies in a seismically active region, straddling the convergent boundary between the Eurasian Plate and the Adriatic Plate, part of the complex collision zone with the African Plate (Alpine-Mediterranean seismic region). The western part of Albania is dominated by active thrust tectonics, making it prone to earthquakes. Significant historical earthquakes include the Shkoder earthquake (1905, Ms 6.6), the Lake Ohrid earthquake (1911, Ms 6.7), the Tepelene earthquake (1920, Ms 6.4), the Durrës earthquake (1926, Ms 6.2), and the Montenegro earthquake (1979, Ms 6.9). The most recent significant event was the Durrës earthquake in 2019 (Ms 6.4).

Hydrological Hazards

Floods are a major concern in Albania, particularly in the western plains where most of the population resides. Major rivers, including the Drin, Seman, Shkumbin, and Vjosë, are prone to flooding during heavy rainfall and snowmelt periods. Historical flood events include those of 1905, 1937, 1952, 1962-63, 2002, and the severe floods of December 2009 - January 2010 in Shkoder (Pazzi et al, 2015)

Atmospheric Hazards

Albania is also vulnerable to atmospheric hazards such as storms and droughts. The Mediterranean climate brings intense rainfall during the winter, leading to storms and potential flooding. Droughts, on the other hand, can occur during the hot, dry summer months, affecting agriculture and water resources.

Biophysical Hazards

Wildfires and epidemics are additional biophysical hazards that pose risks to Albania. Wildfires are common during the dry summer months, while epidemics can arise due to various factors, including poor sanitation and healthcare infrastructure.

Technological and Ecological Hazards

Technological hazards, such as industrial accidents and dam failures, can have severe consequences, especially in areas with inadequate infrastructure and emergency response systems. Ecological hazards, including climate change, are long-term challenges that exacerbate other natural and technological hazards, increasing vulnerability and risk.

DISCUSSION

Case Study: Earthquakes in Albania

Albania's location across the convergent boundary between the Eurasian Plate and the Adriatic Plate makes it prone to intense seismic activity. Historical earthquakes, such as those in 1905, 1911, 1920, 1926, 1979, and most recently in 2019, have caused significant damage. The 2019 earthquake, with a magnitude of 6.4, was the strongest in over 40 years, resulting in 51 fatalities and substantial economic losses. The earthquake's epicenter was 16 kilometers west-southwest of Mamurras, and it was felt as far as Taranto and Belgrade. The financial toll is estimated to be about 985 million Euros.

The earthquake caused widespread damage to buildings and infrastructure, particularly in the cities of Durres and Tirana. Many buildings collapsed or were severely damaged, leading to a significant number of casualties. The response to the earthquake involved international aid and support, highlighting the need for better preparedness and resilience in the face of such natural disasters.

Albania's seismic vulnerability is due to several factors, including its geological setting, building practices, and urban development. The active thrust tectonics in the western part of the country make it susceptible to earthquakes. Moreover, many buildings, especially older structures, are not designed to withstand seismic forces, increasing the risk of damage and casualties during an earthquake.

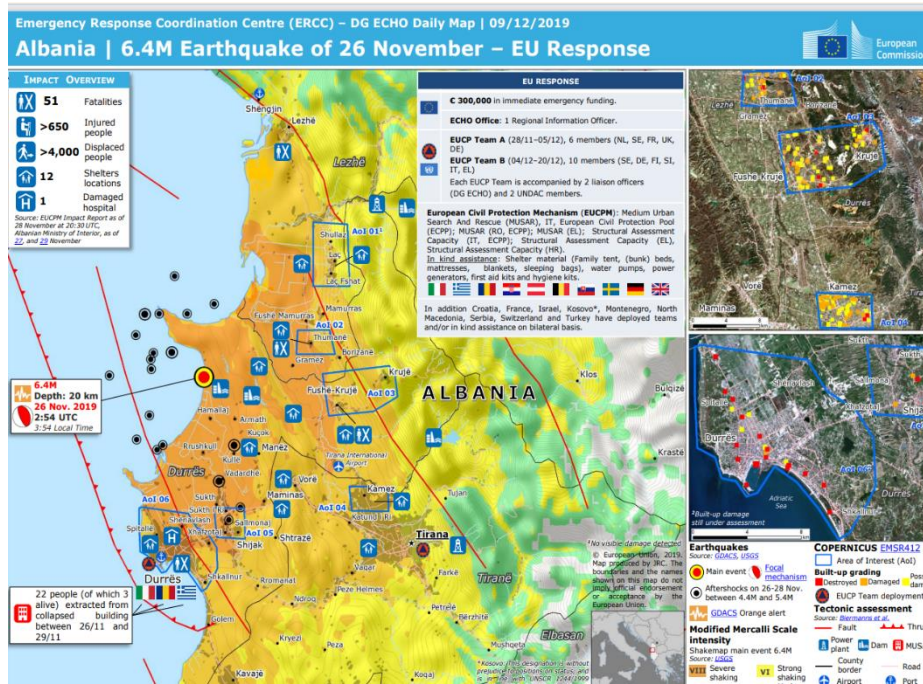


Figure 3. Map of 6.4 M Earthquake of 26 November 2019 (source: Copernicus)

Case Study: Floods in Shkoder Region

The Shkoder region is particularly vulnerable to floods due to its low-lying topography and high population density. Major floods, such as those in December 2009 - January 2010, caused extensive damage. Natural factors, such as continuous rainfall and snowmelt, combined with human factors, like inadequate infrastructure and urban growth, contribute to the frequency and severity of floods in this area.

During the 2009-2010 floods, continuous rainfall and snowmelt in the Drini watershed significantly increased the river's inflows. The situation was exacerbated by the opening of discharge gates from three hydroelectric power plants on the Drin cascade. This led to the flooding of a considerable part of the Shkoder region, particularly the Nënshkodra Lowland. The floods affected 11,400 hectares of land, 2,649 houses were flooded, and 5,173 people were evacuated.

The causes of these floods are attributed to both natural and human factors. The geographical position of the settlements along the shores of Shkoder Lake and the Buna River, combined with low altitude (average 4-6 meters above sea level), make the area particularly vulnerable. Additionally, the lack of flood protection measures, such as drainage channels and water pumping systems, contributed to the severity of the floods. Changes in land use, urban growth, and informal development also played a role in increasing the region's vulnerability (Rustja, 2010).

Human factors exacerbating flood risks include inadequate infrastructure, poor land use planning, and deforestation. The lack of effective flood management systems, such as levees and floodwalls, leaves the region exposed to repeated flooding. Furthermore, rapid urbanization and the expansion of settlements into flood-prone areas increase the risk to human life and property.



Figure 4. Map (source: Copernicus) and photos of 2009-2020 floods (source: D. Rustja)

CONCLUSION

Both earthquakes and floods have had devastating effects on Albania, particularly in the Shkodra region. The 2019 earthquake resulted in significant casualties and economic losses, while the 2010 floods affected thousands of hectares of land and displaced many residents. These events highlight the need for improved hazard management and preparedness.

RECOMMENDATIONS

1. **Enhance Understanding:** Continuously research and monitor the causes of environmental hazards.
2. **Improve Hazard Management:** Develop and implement comprehensive disaster risk reduction strategies at national and local levels.
3. **Develop Better Infrastructure:** Invest in flood protection systems and earthquake-resistant buildings to reduce vulnerability.
4. **Increase Public Awareness:** Engage communities and provide training programs on hazard preparedness.
5. **Strengthen Institutional Capacity:** Enhance coordination among government agencies, NGOs, and international organizations for effective disaster response and recovery.

To mitigate the impact of earthquakes, enforcing building codes that ensure structures can withstand seismic forces is essential. Retrofitting older buildings and infrastructure can also reduce vulnerability. For flood management, investing in flood protection infrastructure, such as levees, floodwalls, and drainage systems, is crucial. Additionally, implementing sustainable land use planning and reforestation can help mitigate the effects of floods.

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DIESEL FUEL ADDITIVE

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ABSTRACT

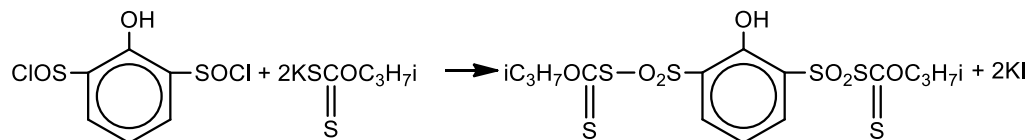
Diesel fuels typically contain significant amounts of unsaturated hydrocarbons that tend to oxidize during production. As a result, if their oxidation process is not interfered with, the fuel changes its consistency, i.e. it thickens due to the formation of resinous substances, changes its color and deteriorates the quality of the fuel. Oxidation of fuels occurs under the influence of oxygen in the atmosphere, and metal surfaces of diesel engine mounting materials play a major role in this process [1, 2].

To increase the stability of fuels, antioxidant additives are added to their composition. Phenol-, amide-, and sulfur-containing compounds can be mentioned among the compounds used as antioxidants in diesel fuels [3].

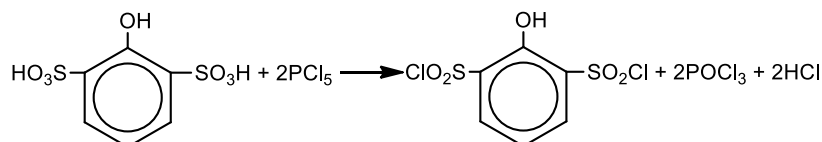
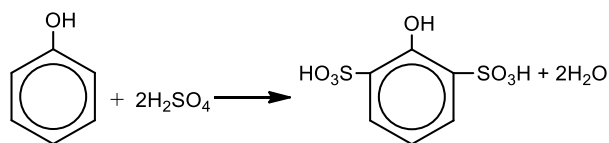
The day-by-day development of the machine-building and petrochemical fields increases the demand for anti-oxidation additives added to the used fuels. The principle of action of additives against oxidation is based on the termination of hydrocarbon oxidation chains in interaction with radicals [4].

The creation of new antioxidants allows the creation of highly efficient diesel fuels that meet modern requirements. Based on sources given in the literature on the structure and composition of antioxidants, 1,3-bis(isopropylxanthogenatosulfophenol) was synthesized and studied as an antioxidant for diesel fuels.

The compound was obtained by cross-synthesis of phenolbisulfochloride and isopropylxanthogenate with potassium salt:



Phenolbisulfochloride, which was taken as a starting material, was obtained analogously by the method of obtaining p-toluenesulfochloride [5]:



The reaction is carried out in an aqueous environment, for 3-4 hours, at 50-55°C. The structure of the obtained substance was confirmed by the IR spectroscopy method.

Keywords: diesel fuel, antioxidant, additive, toluene sulfochloride

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DİJİTAL DÖNÜŞÜMÜN ÜNİVERSİTE EĞİTİMİNE ETKİSİ

THE EFFECT OF DIGITAL TRANSFORMATION ON UNIVERSITY EDUCATION

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Özet

Bu bildiri, dijital dönüşümün kavramsal çerçevesini belirlemek ve anlamak için bir literatür incelemesi yapmakta; dijital dönüşümün üniversite eğitime etkisini ortaya koymaya çalışmaktadır. Dijital dönüşüm, teknolojik ilerlemelerin organizasyonlar ve toplumlar üzerindeki etkilerini anlamak için geniş bir perspektif sunar. Bildiri, dijital dönüşüm kavramını tanımlamak, bileşenlerini açıklamak ve farklı disiplinlerdeki çalışmaları sentezlemek ve dijital dönüşümün üniversitelerdeki eğitimi nasıl etkileyeceği ve ne tür önlemler alınması gerektiğini anlamak amacıyla yazılmıştır. Ayrıca, dijital dönüşümün işletmeler, toplumlar ve endüstriler üzerindeki etkilerini tartışmak için literatürdeki bulgulara odaklanmaktadır. Bu çalışma, dijital dönüşümün karmaşıklığını ve dijital dönüşümün üniversite eğitime etkisini anlamak; gelecekteki araştırmalar için bir temel oluşturmak için bir çerçeve sunmaktadır.

Anahtar kelimeler: Dijital dönüşüm, üniversite, eğitim, teknoloji, endüstri

Abstract

This paper conducts a literature review to determine and understand the conceptual framework of digital transformation; it attempts to reveal the impact of digital transformation on university education. Digital transformation offers a broad perspective to understand the effects of technological advancements on organizations and societies. The paper is written with the aim of defining the concept of digital transformation, explaining its components, synthesizing studies from different disciplines, and understanding how digital transformation will affect education in universities and what measures need to be taken. Additionally, it focuses on findings in the literature to discuss the impacts of digital transformation on businesses, societies, and industries. This study provides a framework to understand the complexity of digital transformation and its impact on university education, aiming to establish a foundation for future research.

Key words: Digital transformation, university, education, technology, industry

Giriş

Bu makale, dijital dönüşümün üniversiteler üzerindeki etkisini uluslararası bir perspektifle incelemektedir. Dijital teknolojilerin hızla gelişmesiyle birlikte, üniversiteler eğitim, araştırma ve yönetim süreçlerinde dijital dönüşüme uyum sağlama ihtiyacıyla karşı karşıyadır. Bu makale, üniversitelerin dijital dönüşüm sürecinde karşılaştığı zorlukları, başarı faktörlerini ve bu dönüşümün eğitim kalitesi, araştırma verimliliği ve yönetim etkinliği üzerindeki etkilerini değerlendirmektedir.

Dijital teknolojilerin hızla gelişmesi ve yaygınlaşması, üniversitelerin işleyişinde önemli değişikliklere yol açmaktadır. Eğitim, araştırma ve yönetim süreçlerinde dijital dönüşüm, üniversitelerin rekabet gücünü artırmak, öğrenci deneyimini iyileştirmek ve toplumsal katkılarına artırmak için kritik bir öneme sahiptir. Dijital dönüşümün üniversiteler üzerindeki etkilerini anlamak, gelecekteki araştırmalar için önemli bir alan oluşturmaktadır. Özellikle, dijital dönüşümün öğrenci deneyimi, araştırma verimliliği ve yönetim etkinliği üzerindeki uzun vadeli etkilerini anlamak için daha fazla çalışma yapılması gerekmektedir.

Dijital teknolojilerin hızla gelişmesiyle birlikte, üniversitelerin eğitim, araştırma ve yönetim süreçlerini dönüştürmek için adımlar atmaları kaçınılmaz hale gelmiştir. Bu makalede, üniversitelerin dijital dönüşüm sürecinde izlemesi gereken stratejiler ve bu stratejilerin başarı faktörleri incelenmektedir.

1. Dijital Dönüşümün Tanımı

Dijital dönüşüm, geleneksel iş süreçlerinin, hizmetlerin, ürünlerin ve toplumsal ilişkilerin dijital teknolojilerle yeniden şekillendirilmesi ve dönüştürülmesidir. Bu dönüşüm, bilişim teknolojilerinin (BT) kullanımını içerir ve genellikle yapay zeka, bulut bilişim, büyük veri, nesnelerin interneti (IoT), blok zinciri ve diğer ileri teknolojilerin entegrasyonunu gerektirir. Dijital dönüşüm, bir kurumun veya toplumun rekabet gücünü artırmak, verimliliği artırmak, müşteri deneyimini geliştirmek ve yenilikçiliği teşvik etmek amacıyla gerçekleştirilir (Smith, J. and Johnson, A.,2022).

Dijital Dönüşümün Temel Kavramları

Dijital dönüşüm, teknolojik ilerlemelerin organizasyonlar ve toplumlar üzerindeki etkilerini anlamak için geniş bir perspektif sunar. Bu kavram, birçok farklı disiplinde incelenmiş ve tanımlanmıştır. Örneğin, işletme alanında dijital dönüşüm, iş modellerinin ve iş süreçlerinin dijital teknolojilerle dönüştürülmesi olarak tanımlanabilir (Westerman et al., 2014). Bilgi sistemleri literatüründe ise dijital dönüşüm, bilgi teknolojilerinin organizasyonların performansını artırmak için nasıl kullanılabileceğini anlamak için bir çerçeve sağlar (Ross et al., 2006). Ayrıca, sosyal bilimlerde dijital dönüşüm, teknolojik ilerlemelerin toplumların kültürel, sosyal ve ekonomik yapılarını nasıl değiştirdiğini inceleyen geniş bir alanı kapsar (Castells, 1996).

Dijital Dönüşümün Önemi ve Etkileri

Dijital dönüşüm, birçok açıdan önemlidir ve derin etkilere sahiptir.

Bu etkiler şunları içerir:

Rekabet Gücü: Dijital dönüşüm, bir organizasyonun rekabet gücünü artırır. Daha hızlı iş süreçleri, daha iyi veri analitiği ve daha etkili müşteri ilişkileri yönetimi gibi faktörler, şirketleri rekabet avantajı elde etmeye yönlendirir (Brown, C., & White, L., 2023).

Verimlilik: Dijital dönüşüm, iş süreçlerini optimize ederek ve otomatikleştirerek verimliliği artırır. İnsan hatasını azaltır, iş süreçlerini hızlandırır ve kaynakların daha etkin kullanılmasını sağlar (Green, M., et al.,2021).

Müşteri Deneyimi: Dijital dönüşüm, müşteri deneyimini iyileştirir. Kişiselleştirilmiş hizmetler, daha hızlı tepkiler ve daha kullanıcı dostu arayüzler müşteri memnuniyetini artırır (Lee, K., & Garcia, R.,2020).

İnovasyon: Dijital dönüşüm, yenilikçiliği teşvik eder. Yeni teknolojilerin kullanımıyla, şirketler yeni ürünler ve hizmetler geliştirebilir, iş modellerini yeniden şekillendirebilir ve pazarlarda liderlik yapabilir (Martinez, E., et al.,2023).

Dijital Dönüşümün Yönetimi

Dijital dönüşümü etkili bir şekilde yönetmek, organizasyonlar için kritik öneme sahiptir. Etkili dijital dönüşüm yönetimi için gerekli olan stratejiler şu şekilde sıralanabilir.

Liderlik ve Vizyon: Dijital dönüşüm sürecini başlatmak için liderlik ve net bir vizyon gereklidir. Üst düzey yöneticiler, dijital dönüşümün önemini anlamalı ve organizasyonun hedeflerini belirlemelidir (Johnson, M., & Smith, P.,2021).

Kültürel Değişim ve Yetenek Geliştirme: Dijital dönüşüm, organizasyonun kültürünü ve iş yapma biçimini değiştirir. Bu nedenle, çalışanlar arasında dijital okuryazarlık ve yetkinliklerin geliştirilmesi önemlidir (Clark, R., et al.,2019).

Teknoloji Yatırımları: Dijital dönüşüm, uygun teknoloji yatırımlarını gerektirir. Organizasyonlar, ihtiyaçlarına ve hedeflerine uygun teknolojileri seçmeli ve bu teknolojilerin entegrasyonunu sağlamalıdır (White, L., & Brown, C.,2018).

Veri Güvenliği ve Mahremiyet: Dijital dönüşüm sürecinde, veri güvenliği ve mahremiyet ön planda olmalıdır. Organizasyonlar, hassas verilerin korunmasını ve yasal düzenlemelere uyumu sağlamak için gerekli önlemleri almalıdır (Garcia, R., et al.,2020).

Dijital Dönüşümün Bileşenleri

Dijital dönüşümün ana bileşenleri, teknoloji, organizasyon ve insan faktörlerini içerir. Teknoloji bileşeni, dijital platformlar, yapay zeka, nesnelerin interneti ve diğer dijital araçları kapsar. Organizasyon bileşeni, iş süreçleri, yapılar, kültür ve stratejiler gibi organizasyonel unsurları içerir. İnsan bileşeni, dijital dönüşüm sürecinde çalışanların eğitimi, kabulü ve uyumu gibi insan faktörlerini ele alır (Bharadwaj et al., 2013).

2.Dijital Dönüşümün Üniversite Eğitimine Etkileri

Dijital dönüşümün uluslararası düzeyde işletmeler, toplumlar ve endüstriler üzerinde çeşitli etkileri vardır. İşletmeler, dijital dönüşümü rekabet avantajı elde etmek, müşteri deneyimini iyileştirmek ve yenilikçilik kapasitelerini artırmak için kullanabilirler. Toplumlar, dijital dönüşümle birlikte eğitim, sağlık hizmetleri ve kamu hizmetleri gibi alanlarda daha iyi hizmetler sunabilirler. Endüstriler ise dijital dönüşümle birlikte yeni iş modelleri ve pazar fırsatları keşfedebilirler (Lacity et al., 2017).

2.1.Üniversitelerde Dijital Dönüşümün Eğitim Süreçlerine Etkisi

Dijital dönüşüm, üniversitelerin eğitim süreçlerini kökten değiştirmektedir. Çevrimiçi dersler, dijital kütüphaneler, interaktif öğrenme platformları ve uzaktan eğitim gibi dijital araçlar, öğrencilere daha esnek ve erişilebilir bir öğrenme ortamı sunmaktadır. Ancak, dijital dönüşümün eğitim süreçlerine entegrasyonu, öğretim elemanlarının eğitimi, öğrenci katılımı ve değerlendirme süreçlerindeki değişiklikler gibi zorluklarla da beraberinde gelmektedir (Graham et al., 2020).

2.2.Üniversitelerde Dijital Dönüşümün Araştırma Süreçlerine Etkisi

Araştırma süreçlerinde dijital dönüşüm, bilimsel keşif süreçlerini hızlandırabilir ve araştırmacıların verimliliğini artırabilir. Büyük veri analitiği, yapay zeka, nesnelerin interneti ve diğer dijital teknolojiler, araştırma verilerinin toplanması, analiz edilmesi ve paylaşılmasını kolaylaştırabilir. Ancak, bu teknolojilerin etkili bir şekilde kullanılması için altyapı, veri güvenliği ve etik konular gibi önemli hususlar da dikkate alınmalıdır (Scherer & Wessel, 2018).

2.3.Üniversitelerde Dijital Dönüşümün Yönetim Süreçlerine Etkisi

Dijital dönüşüm, üniversitelerin yönetim süreçlerini daha etkin hale getirebilir. Öğrenci kayıt işlemleri, finansal yönetim, insan kaynakları yönetimi ve idari süreçlerin dijitalleştirilmesi, üniversitelerin kaynaklarını daha etkin bir şekilde kullanmasını sağlayabilir. Ancak, bu sürecin başarılı bir şekilde yönetilmesi için liderlik, stratejik planlama ve personel eğitimi gibi faktörlerin dikkate alınması gerekmektedir (König & Heidler, 2019).

2.4.Uluslararası Uygulamalar ve Deneyimler

Farklı ülkelerdeki üniversiteler, dijital dönüşüm sürecinde farklı yaklaşımlar benimsemektedir. Örneğin, Amerika Birleşik Devletleri'nde, teknoloji tabanlı eğitim programları ve araştırma merkezleri yaygın olarak kullanılmaktadır. Avrupa'da ise, dijital dönüşüm genellikle ulusal düzeyde koordine edilen stratejilerle desteklenmektedir. Asya'da ise, yapay zeka, robotik ve diğer ileri teknolojilerin üniversite sistemine entegrasyonu hızla artmaktadır.

2.5.Dijital Dönüşüm Kapsamında Üniversitelerin Yapması Gerekenler

2.5.1.Dijital Yeteneklerin Geliştirilmesi

Üniversiteler, dijital dönüşüm sürecinde öncelikle personelinin dijital yetkinliklerini geliştirmelidir. Bu, eğitim programları ve profesyonel gelişim fırsatları aracılığıyla gerçekleştirilebilir. Öğretim elemanlarına ve idari personeline dijital araçları etkili bir şekilde kullanma becerisi kazandırmak, dijital dönüşümün başarılı olması için temel bir adımdır (Brown, 2020).

2.5.2.Dijital Altyapının Güçlendirilmesi

Üniversitelerin, dijital dönüşüm sürecinde etkili bir şekilde çalışabilmesi için güçlü bir dijital altyapıya ihtiyacı vardır. Bu, geniş bant internet erişimi, güvenli ağlar, modern bilgi teknolojileri altyapısı ve veri depolama çözümlerini içermektedir. Üniversiteler, bu altyapıyı güçlendirmek için bütçe ayırmalı ve teknolojik altyapılarını sürekli olarak güncellemelidir (Smith, 2019).

2.5.3.İşbirliği ve Ortaklıkların Geliştirilmesi

Üniversiteler, dijital dönüşüm sürecinde sektör ortaklarıyla işbirliği yapmalı ve endüstriyel ortaklıklar kurmalıdır. Bu, staj ve iş imkanları sunmanın yanı sıra, araştırma projeleri ve teknoloji transferi fırsatları da sağlayabilir. Endüstriyel ortaklıklar, üniversitelerin öğrencilere pratik deneyim kazandırmasına ve araştırma sonuçlarının ticarileştirilmesine yardımcı olabilir (Jones & Williams, 2020).

2.5.4.Yenilikçilik ve Girişimciliğin Teşvik Edilmesi

Üniversiteler, dijital dönüşüm sürecinde yenilikçiliği ve girişimciliği teşvik etmelidir. Bu, girişimcilik merkezleri, teknoloji transfer ofisleri ve inkübasyon programları gibi yapılar aracılığıyla gerçekleştirilebilir. Üniversiteler, öğrencilere ve araştırmacılara yenilikçi fikirlerini geliştirme ve ticarileştirme fırsatları sunarak ekosistemlerini destekleyebilir (Gupta, 2021).

2.5.5.Dijital Etik ve Güvenliğin Önemi

Üniversiteler, dijital dönüşüm sürecinde etik ve güvenlik konularına özel önem vermeli ve bu alanlarda politikalar geliştirmelidir. Öğrenci verilerinin korunması, bilgi güvenliği önlemlerinin alınması ve yapay zeka gibi ileri teknolojilerin etik kullanımı konularında net kurallar belirlenmelidir. Ayrıca, öğrencilere ve personeline dijital güvenlik konusunda eğitim verilmelidir (Liu et al., 2020).

2.5.6.Çeviklik ve Adaptasyon Yeteneğinin Geliştirilmesi

Üniversiteler, dijital dönüşüm sürecinde çeviklik ve adaptasyon yeteneğini geliştirmelidir. Bu, hızla değişen teknolojilere uyum sağlamayı ve değişen piyasa koşullarına cevap vermeyi içerir. Esneklik, öğrenme kültürü ve sürekli iyileştirme prensiplerini benimseyen üniversiteler, dijital dönüşüm sürecinde başarılı olma olasılığını artırabilirler (Wong et al., 2018).

Sonuç ve Öneriler

Dijital dönüşüm, iş dünyasında ve toplumda derin etkilere sahip olan önemli bir kavramdır. Rekabet gücünü artırır, verimliliği artırır, müşteri deneyimini iyileştirir ve yenilikçiliği teşvik eder. Ancak, etkili bir şekilde yönetilmesi gereken karmaşık bir süreçtir. Organizasyonlar, dijital dönüşümü başarılı bir şekilde yönetmek için liderlik, kültürel değişim, teknoloji yatırımları ve veri güvenliği gibi faktörlere dikkat etmelidir.

Bu bildiriye, dijital dönüşüm sürecindeki üniversitelerin yapması gereken stratejiler ele alınmıştır. Dijital yeteneklerin geliştirilmesi, dijital altyapının güçlendirilmesi, işbirliği ve ortaklıkların geliştirilmesi, yenilikçilik ve girişimciliğin teşvik edilmesi, dijital etik ve güvenliğin önemi ve çeviklik ve adaptasyon yeteneğinin geliştirilmesi gibi adımlar, üniversitelerin dijital dönüşüm sürecinde başarılı olmalarına yardımcı olabilecektir.

Dijital dönüşüm, iş yapma şekillerini, toplumsal ilişkileri ve bilgi iletişimini kökünden değiştirmekte, bu da eğitim kurumlarını etkilemektedir. Üniversiteler, toplumun dijital dönüşüm sürecindeki liderleri olmalıdır. Bu liderlik rolü, hem öğrencilere hem de personeline dijital beceriler kazandırmayı içermelidir. Ayrıca, üniversiteler, dijital teknolojileri kullanarak eğitim kalitesini artırabilir, araştırma olanaklarını genişletebilir ve toplumsal etkiyi artırabilir.

Üniversitelerin bu süreç içerisinde yapması gerekenler şu şekilde sıralanabilir:

1. **Dijital Yetkinliklerin Geliştirilmesi:** Üniversiteler, öğrencilere dijital beceriler kazandırmak için müfredatlarını gözden geçirmeli ve güncellemelidir. Dijital beceriler, sadece bilgisayar bilimi bölümleriyle sınırlı kalmamalı, tüm disiplinlerde vurgulanmalıdır.
2. **Altyapı ve Teknoloji Yatırımları:** Üniversiteler, dijital dönüşümü desteklemek için altyapı ve teknoloji yatırımlarına odaklanmalıdır. Bu, güçlü bir internet altyapısı, güncel yazılım ve donanımın yanı sıra dijital araçların yaygın kullanımını içerir.
3. **Erişilebilirlik ve Kullanılabilirlik:** Üniversiteler, dijital hizmetlerini tüm kullanıcılar için erişilebilir ve kullanılabilir hale getirmelidir. Engelli bireylerin ihtiyaçlarını karşılayacak şekilde tasarlanmış dijital platformlar, kapsayıcı bir eğitim ortamı sağlar.
4. **Araştırma ve İnovasyon:** Üniversiteler, dijital teknolojilerin araştırma ve inovasyondaki potansiyelini keşfetmeli ve bu alanda çalışmalara öncelik vermeli. Endüstri ile iş birlikleri kurarak, dijital yenilikleri toplumsal faydaya dönüştürme konusunda liderlik yapabilirler.
5. **Veri Güvenliği ve Mahremiyet:** Üniversiteler, dijital verilerin güvenliğini ve mahremiyetini sağlamak için gerekli önlemleri almalıdır. Öğrenci ve personel bilgilerinin korunması, kurumun itibarı ve güvenilirliği açısından kritiktir.

Dijital dönüşüm sürecindeki üniversiteler, sadece teknolojiyi kullanmayı öğrenmekle kalmamalı, aynı zamanda bu teknolojilerin eğitim, araştırma ve toplumsal etki alanlarında nasıl kullanılacağını da anlamalıdır. Bu, sadece üniversite toplulukları için değil, aynı zamanda toplumun genel refahı için de hayati öneme sahiptir.

Teknolojinin hızla gelişmesiyle birlikte, toplumlar ve iş dünyası, dijital dönüşüm sürecine girmiştir. Dijital dönüşüm, bir organizasyonun veya toplumun iş yapma şeklini, iş süreçlerini ve toplumsal ilişkilerini kökünden değiştiren bir kavramdır. Bu makalede, dijital dönüşümün tanımı, etkileri ve önemi incelenecek, bu dönüşümün nasıl gerçekleştiği ve nasıl yönetilebileceği tartışılacaktır.

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HAIKU POEMS: THE GAME BETWEEN LITERAL AND FIGURATIVE MEANING

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Abstract

The purpose of this paper is to look at the way that haiku poems are built. While they are poems of Japanese origins, they have been adapted to other cultures. We can no longer speak of haiku poems as a fixed poetry genre and we can no longer claim that the standard, stereotypical by now, definition of a poem about nature, with seasonal reference, written on the pattern of three lines and 5-7-5 syllables, using juxtaposition, covers it all. We need to look at specific cases of haiku authors from the Western world in order to see how haiku poems have become increasingly diverse and how they cannot be defined once and for all, since, while apparently alike, they are completely different. They are not simple and they are not just fixed form poems. They are complex, just like Western poetry. While they do not use the usual figurative language of Western poetry, they create figurative language associations through the combination of their two parts. While the images are concrete for both parts, together they lead the reader towards a figurative meaning. In some cases, such as in the poems by Romanian author Șerban Codrin, we can notice a game between literal, concrete and figurative meaning. The following poems will be analysed: “Leaves falling -/ remaining in the empty trees/ only the truth” and “I hide under the ground/ what you have never seen:/ a handful of seeds” (my translations). The poems by Codrin play with these two meanings, and allow us to see that even in the literal sense the situations are not under dispute. The trees remain the way they are. The seeds hidden in the ground were never seen by us. We can feel a sense of mystery.

Keywords: juxtaposition, kireji, associations.

INTRODUCTION

Haiku poems, while originating in Japan, and a unique product to Japanese culture, have spread all over the world, and throughout historical ages, to the point where they are now part of every culture. This type of poem can be regarded as a cultural product which has proved to be extremely adaptable, likely due to its universality of experiences dealt with, and which has proved to be a point of contact and communication between two areas and sets of otherwise extremely different cultures due to different mindsets, values, traditions, rituals, practices, and lifestyle.

Often, we can take a cultural products and see it as being unique to a culture, based on the way it can be fit in within the grid devised by Baciu (2012), which is called culture identity manifestations, and which includes the following categories which can help, by assigning elements to them, differentiate among cultures, and which are: values, symbols, rituals, traditions, practices, and personalities.

As a value, the haiku poem traditionally emphasised the present moment, with the awareness of the here and now of the observer, in an objective manner, based on Zen Buddhist mindset. The poets would, in some cases, be Zen Buddhist monks, such as Basho, but not necessarily. They could, however, start travelling and meditating in solitude. Some haiku authors were tea masters, samurai, geisha, emperors, and so on. It was a form of poetry anyone could try. The Zen Buddhist mindset

was translated into a practice through haiku poetry writing, alongside other practices, such as meditation, the tea ceremony, and ikebana. As common symbols of the value of Zen Buddhism and the present moment, we could find the kigo, or the seasonal references, which included allusions, such as flowers which are blooming during a specific season, or natural phenomena occurring only during a season, making it easy to be identified, or direct mention of the seasons or moments of day. Additionally, the idea that we need to accept that this world is ephemeral, that we are going to lose everything and everyone we love, that every moment is fleeting, standing at the basis of Buddhist belief is also present in haiku poems, suggested through symbols such as the cherry blossoms, which should be enjoyed here and now as their beauty does not last for long, just as the Cherry Blossom Festival suggests as a practice. The cherry trees in bloom are very beautiful, but it does not take long before all the petals and blossoms fall.

The haiku poem seems to be touching on universal observations, on specific concerns to human nature. Loss and death are all part of our lives, which can easily help us connect with the Japanese or with any other people, regardless of their otherwise different values, lifestyle, and ways of thinking.

Originally, haiku poems were Japanese poems, but, gradually, they have been adopted by other culture all over the world. We may all be familiar with Basho, the master that started it all, Shiki, the one that created the kireji, or the cutting line, dividing the haiku poem in two parts, at least syntactically, which can further on be combined through juxtaposition to suggest another meaning, beyond the literal and concrete level of what we notice before us, while moving towards a figurative meaning. A haiku poem is never purely descriptive. The images chosen in the two parts are never chosen by chance. Everything is carefully selected, from images from the scene we are witnessing as observers to each and every word which is used to convey the image. The haiku poem is very short and concise, which makes each and every detail chosen to be significant in the readers' understanding of the poem. Since it is so concise, it should definitely bring over a powerful image which should impress the reader, as it should not allow the readers to get lost in unnecessary details and images. The images are generally visual and concrete, yet exceptions to the rule are always present.

We can witness the tendency of Western culture members to set up rules for writing haiku poems, yet these rules are just an orientation. They can never become a template which should be used as such at all times.

We may find as many interpretations and styles of haiku poems, as many as there are experiences of those writing and reading them. The variety ranges from contents, meaning that there may or may not be a seasonal reference, or that the haiku poem may or may not be about nature, but, instead, about the city, the interior of a house, etc., to form, regarding whether or not a poem respects the three syllables, 5-7-5 syllables format. The fixed form of the haiku poem is a simple expectation based of Western cultures members' understanding. It is not an absolute truth and it is not, definitely, the only way in which we can write haiku poems.

The debate between the traditional, 5-7-5 syllables format and three lines haiku poems is not new today, and it is also not specific to Western culture members. It has been raised, in Japan, since the 1910, with the free-rhythm haiku movement, beginning with Japanese haiku writers such as Hekigoto Shin-Keiko, continuing with Seisensui Ogiwara, and with the student of the latter haiku poet, Santoka Taneda (Kiuchi & Hakutani 2022). Shiki himself challenged the traditional haiku format of 5-7-5 syllables and three lines (McCarty, 2008).

Therefore, we could notice that, while for Western culture poets, the haiku poem seems to offer the ground for plenty of experimentation, this usage is not specific to our times and to Western cultures, especially to American culture, which is focused on innovation and creativity, as it is one of the cultures and societies where individualism ranks at a very high level (Potter, 2019), and which has set the example for many other countries and cultures in this respect.

Additionally, the definition of haiku found in dictionaries, referring to the traditional number of syllables and lines, as well as to this poem being about nature, having a seasonal element, two parts, forming a juxtaposition, and being a visual poem, about the here and now, containing no abstract ideas, can only be considered a stereotypical understanding of the haiku poem. If we look at the many styles of haiku poems existing all over the world, we are going to notice that, starting with Japanese culture itself, the haiku poem is as complex and as deep as the Western type of poetry. While the usual figures of speech which are used by Western culture poets tempted to apply the usual lyricism and emotional frame they have become familiar with in their understanding of poetry are absent, sometimes we can see even this understanding being challenged.

The haiku poem can continuously challenge our perception of haiku and of poetry itself. Poetry, like any form of art, should surprise us and offer us a new perception on usual experiences, in the manner in which Shklovsky (1917) presents his theory of defamiliarization, according to which art should challenge our previously established patterns of understanding reality.

MATERIALS AND METHODS

In order to show the need to break off with the stereotypical, limiting, and not able to describe the reality and subtleties of the haiku poem, the present paper will start from the analyses of two haiku poems by a Romanian haiku poet, Șerban Codrin. They have been selected from his book *Dincolo de tacere/ Aux confins du silence/ Beyond Quietness*, published in 1994, at Haiku Publishing House, in Bucharest, Romania.

Șerban Codrin, on his real name Șerban Codrin Denk, was born in 1945, and he is considered one of the masters of the Romanian haiku poem. He has been among a group of authors preoccupied with understanding the haiku poem and practising its writing before there was wide-spread access and increasing activity on the Internet, in online haiku communities. One of the most notable haiku poetry associations, since it has widespread and daily interaction and activity, is the group called Romanian Kukai, led by master Corneliu Traian Atanasiu. It has been founded in 2007, and it started with a blog which still exists today, and where information about haiku poems, analyses and theory devised by Atanasiu were and are still posted, together with activities based on the kukai type of contests in Japan, when traditionally disciples would be led by a master on a walk in nature to observe, then to start writing haiku poems, read them anonymously and vote for them. Then, the names of the authors would be revealed, and the master would comment on the poems. The traditional kukai has been adapted to an online contest format, inspired from such contests held in the international community. The practice of online haiku contests is now widespread, and an extremely frequent activity, held at world, international level, as much as at local level. Currently, the Romanian Kukai group has several blogs, the first one which is used for information on haiku poems and mostly for the monthly context, a separate one for the weekly contest, one for a haiku club where authors were asked to do an exercise to be creative by writing another haiku of their own based on a similar structure with a good poem, by authors from their community, whose mechanism was explained by Atanasiu. This was based on a similar exercise the Japanese did which they called honkadori.

Within the Romanian Kukai community, which has been understood through the participatory observation method with netnographic research (Kozinets, 2012), or the ethnographic study of online communities, since the author of the present paper is a member and writer of haiku poems herself, Șerban Codrin occupies the status of personality within the culture identity manifestations grid devised by Baciu (2012). What is noticeable is that the Romanian Kukai community can be analysed using the categories in this grid, since it is a culture at its own level, or a subculture. As values, it has the deep understanding of haiku poems by constant analysis and practice. As symbols, it has the haiku poem, with which the community is preoccupied. As traditions, rituals, and practices, we can include the contests, the publications of the group, individually by the authors or as part of anthologies, published periodically, the Zoom meeting which takes place weekly and

where discussions are based on a topic of discussion, which is then exemplified by haiku poems read or written by the participant, where a special guest, a haiku author is occasionally invited, and where in the second part of the meeting the poems in the weekly haiku contest are being discussed. The blog entitled Haiku of the Day presents a notable haiku worth the attention of the community members, written by already established Romanian haiku poets, well as by newly arrived members, once they manage to write good haiku poems. Daily interaction is ensured in the Facebook group Autori de haiku din Romania (Haiku Authors from Romania), where we can find information on the periodical contests, analyses of haiku poems by Atanasiu and by the members of the community, poems proposed for analysis and improvement, book launching events, and so on.

Șerban Codrin's poems have been analysed and set as examples by Atanasiu on numerous occasions. Therefore, Șerban Codrin can be a haiku poet that is notable within this community, as well as for other communities of haiku poets in Romania, and for the haiku movement in Romania altogether. This makes his haiku poems worthy of attention.

His poems are available for the international community as well, since his 1994 book has his poems published in their Romanian version, together with their translations in English and French. The haiku authors in Romania are mostly participating in haiku related activities from abroad such as contests and anthologies within the communities using English and French as languages, since these are the most widely known international languages in Romania.

The poems chosen for analysis by the author of this paper, which were written by Șerban Codrin were selected based on the technique which she noticed that both poems were based on, namely the game between literal and figurative meaning, an observation which will be detailed in what follows.

First of all, the two poems to be analysed are the following, in their Romanian and in the translations of the author of the present paper, since she considered that her translations supported better her own understanding and interpretations of Șerban Codrin's haiku poems. Additionally, the translations done by the author of the present paper were considered by her more in line with the syntactic structure promoted and taught within the Romanian Kukai community, which should also be reflected in the English version. The haiku poem requires a specific understanding to be translated and it has been discussed with the Romanian Haiku community on several occasions that the translators of haiku poems should, first of all, understand and have background on haiku poems to capture the spirit and transmit it further on to the readers.

Below are presented the poems by Șerban Codrin, in Romanian, together with their translation by the author of the present paper in the English language, and their translation by Virginia Cucu and Stefan Benea, in Șerban Codrin's book published in 1994, for comparison:

(1)

Frunzele căzând –
rămâne-n copacii goi
doar adevărul (Șerban Codrin, 1994)

Leaves falling –
remaining in the empty trees
only the truth (my translation)

After the leaves' fall –
in the naked trees remains

only the plain truth! (translation by Virginia Cucu and Stefan Benea, in Codrin, 1994)

(2)

Ascund în pământ
ce n-ați văzut vreodată:
un pumn de boabe (Șerban Codrin, 1994)

I hide under the ground
what you have never seen:
a handful of seeds (my translation)

I hide in the earth
something never seen before:
a handful of grains (translation by Virginia Cucu and Stefan Benea, in Codrin, 1994)

While the haiku poem is presented, in its stereotypical, dictionary definition, as being based on visual images, and while some haiku writing communities on online social media present, in their beginning, as featured posts, such characteristics and definitions as general guidelines for understanding haiku and trying to keep into account, we can see that, at closer and deeper understanding, the haiku poem can escape such narrow definitions. The question: “What is a haiku poem?” proves to be one which is not easy, if possible at all, to be answered in one sentence.

If we look at the first poem by Șerban Codrin, we notice how, in the first two lines, concrete visual images that can be noticed on an everyday life basis during the autumn season, and which can be considered symbolic of and identifying elements of the autumn season, are further closed and completed with the detail in the last line, namely the word truth, which is the only one left in the trees without any remaining leaves. Such a poem not only contradicts the idea we have seen in various online haiku communities claiming that abstract nouns should not be included in haiku poems, but also what we generally separate, as readers of all backgrounds in literary works, as the concrete, literal and abstract, or figurative sense. We could claim that there can be various approaches to haiku poems, just as there can be various types of haiku poems. We can notice how various online haiku groups on social media, various communities, various magazines, and contest judges appreciate a certain way of writing haiku poems, and they present their approaches in the submission guidelines.

Șerban Codrin’s first haiku poem can be interpreted as visible in the translation by Virginia Cucu and Stefan Benea (in Codrin, 1994), where they see a reference to the plain, or naked, truth, a usual phrase we use in everyday life and daily speech to the point where it is no longer perceived as expressive. We no longer reflect on its meaning, or think about the way we could visualize it or think about it in an abstract sense. This ignored part, since it has become eroded by common, frequent use, to the point where it is no longer even noticed, of the presence of both abstract and concrete meanings, once we consider that *truth* is an abstract noun, and we cannot visualize it, and once it is materialized by the suggestion created around it by the noun *naked*, which is usually associated with the human body and with very visual and concrete, literal images. Nobody, however, notices this contrast anymore. The haiku poem refreshes and challenges our perception, as Shklovsky (1917) sees as the very purpose of an artistic object. We can see, from this point of view, the naked truth under the form of the naked trees, without any leaves. From this point of view, we

can consider the first part of the poem as the fact we notice before us, in reality, and the second part as its interpretation, based on a play upon words, in a figurative, abstract, and philosophical sense, eventually.

The philosophical sense of the poem, in the interpretation of the author of the present paper, is the following: the truth refers to the way in which everything is ephemeral, subject to loss, decay, and death. The falling leaves are associated with the end of human life, since autumn is associated, both culturally, based on other poems, with the end of human life, sadness, and even depression, due to the SAD (seasonal affective disorder) which occurs during seasons of passage, and which is characterized by a feeling of various degrees of sadness and feeling of the end, not just of the seasonal cycle, but especially of human life. The truth we can associate with the images of the falling leaves and the empty trees can be that we are all moving towards death. The Zen Buddhist mindset claims we should come to terms with this, since this is the natural course of life. Additionally, we could associate the falling leaves with the well-known and frequently promoted image of cherry blossoms and their fall, which in turn is associated with the symbol of ephemerality of life and beauty. Everything we have, according to Zen Buddhist beliefs, is the present moment. Moreover, the haiku poem is believed to be, and there is proof it is, at least in some cases, about a moment of revelation, or enlightenment, which we associate with the Zen Buddhist philosophy as Western culture members, since we perceive this as the defining feature of Zen Buddhism and, eventually, of the haiku poem.

The translation by Virginia Cucu and Stefan Benea (in Codrin, 1994) focuses, in the first line, on the moment the leaves are already gone from the tree. In my translation, the leaves are still falling, as this is the literal meaning in the Romanian and version. I thought it was significant since the leaves are presented in the process of falling, and, therefore, of change. The change occurs continuously, and the moments pass us by. Time cannot be stopped. The present continuous can better underline this idea than the one where the process of the leaves falling has already stopped. The present continuous has been used in my translation since I interpreted the poem as being about the moment of enlightenment when it dawns on us that the world is constantly changing, that nature's course is in a continuous move, that we are living and eventually we are moving towards the end of life. In this translation, I highlight how we are faced with the change in progress right before our eyes. We actually see it literally, as well as figuratively, leading us towards abstract thinking. The move from the leaves falling and the empty trees to truth is clearly a meditative, philosophical one, and, significantly, the leaves falling and the empty trees are concrete, while the noun "truth" refers to an abstract notion. The free associations present in psychoanalysis (Lothane, 2019), through which a patient or someone going through self-analysis starts from an image, or word, or a feeling, and starts saying whatever comes to his or her mind related to one of these elements is at work in haiku poems. We know that Japanese culture is an indirect communication culture (Ciubancan, 2015; Midooka, 1990). This leads to the following consequences: they do not say exactly what they mean, using the exact words. Instead, they can use language reminding of polite requests we are all familiar with, or with suggestions, yet for the Japanese culture this goes beyond the level of polite language and brief mentions and suggestions. They can say one word and mean something else, to the point where they can say "yes," then start giving clues using body language, hesitations, and various suggestions that they mean "no." As an example, they may say "yes" meaning that they want to maintain the harmony of the relationship and remain friends or collaborators in the future with the interlocutor. They do not want to offend the interlocutor, so they say "yes." The "no" should be interpreted from the clues the Japanese persons give throughout the rest of the communication. This may be difficult for those belonging to other cultures.

Poetry works in a similar way, through suggestions and allusions, as well as through associations. In the case of Șerban Codrin's first poem, the falling leaves and the empty trees work through associations with thinking about the fate we are all going to meet, eventually.

For the Zen Buddhist mindset, this needs to be accepted. When we meditate, moreover, we need to see reality before us the way it is. We need to leave behind all of the preconceived notions and

everything we have learned. The trees remain just trees, naked of any other meaning we ascribe to them. In Western culture, we can ascribe to them by projection a state of sadness and loss, with the falling of their leaves. Yet, in this poem by Codrin, we face the truth, and nothing more. Nature is what it is, and this idea can appear in the mind of the readers by association with the word “truth.” Empty spaces in Japanese culture do not have a negative connotation. On the contrary, they are believed to allow room for creativity, as well as, indoors, for personal contact without the obstacle of objects and furniture among persons. Therefore, the truth in the poem is something positive, suggesting, in turn, a peaceful state of mind, of a person that has become wise with age to understand the aspects of existence which cannot be changed, but, instead, need to be accepted as such.

The translation by Virginia Cucu and Stefan Benea (in Codrin, 1994) the word “naked” is used instead of “empty,” yet I considered it as part of a much too direct communication style for a haiku poem, which should suggest, indirectly, the nakedness in the minds of the reader, by association with the emptiness. We also notice a contrast between the empty trees and the truth, between nothing and the truth which is substantial. Ideas become much more substantial than concrete reality, which is, eventually, subject to loss, decay, and death.

In addition, the translation by Virginia Cucu and Stefan Benea (in Codrin, 1994) does not show a clear break, syntactically, between the two parts of the poem. If we remove the kireji, or the cutting line, we do not feel a break in the two parts without it. We can read this translation as a continuous sentence. My translation highlights the break between the two parts, into two sets of images, the first one with the leaves falling, and the second one, with the empty trees left only with the truth in them. The image could, at this point, be considered a fantasy one, due to the smooth passage from literal, concrete reality to abstract words and thinking, and figurative meaning.

In the second poem by Șerban Codrin we notice a similar game between literal and figurative meaning, which is based on a fact that we realize we have not been aware of until the poet pointed it to us. Indeed, when we plant seeds in the ground, we can say that we are hiding something that someone has never seen, as the plants from the seeds have not sprouted yet. I have preferred, in my translation, to translate everything almost word for word, as I found it would capture best the observing of the exact fact of the reality before us. I emphasized the action of hiding by using “under the ground” for the seeds, instead of “in the earth” in the translation by Virginia Cucu and Stefan Benea (in Codrin, 1994). The phrase “something never seen before,” in the translation Virginia Cucu and Stefan Benea (in Codrin, 1994), followed by “a handful of grains,” shows too directly by communicating too directly the preciousness of the seeds. In my translation I attempted to suggest, through almost word for word translation, the same effect I noticed in the Romanian version.

Here, in the Romanian and the two translated versions in the English language we notice how the cutting line, or kireji, is not a line but a colon mark. This attracts our attention to the last line, which is considered to contain the surprise element of the poem. The seeds, just like the truth in the first poem by Șerban Codrin can be considered both the surprise, or the key elements of the poem, from where the interpretation can begin, or to which all the interpretation of the poem leads. These are also the elements which serve to connect all the elements of the poem.

The seeds can be interpreted as something mysterious, which can be, by association, the future. We never know what the future can be like. According to Zen Buddhist beliefs, all we have is the present, as the future does not even exist yet. This is why the seeds in this poem by Codrin can be considered alongside the real of fairy-tales, where magic can happen, but, at the same time, where there are plenty of illusions. We associate the word *fairy tales* with naivete and loss of contact with reality, with daydreaming and with lack of practical, down-to-earth thinking. The result of the seeds is not yet concrete, and we wonder if it will ever be. Still, we can notice the contrast established between the earth, present literally, the activity of planting seeds which is a very practical one, on the one hand, and, on the other hand, the suggestions regarding an uncertain future, about which we

daydream. The seeds are associated with fairy tales since they are special and precious, and readers may recall the magic surrounding seeds in fairy-tales, where plants grow very fast and bring the hero to another realm, such as in the tale of Jack and the Beanstalk or bring to life small creatures such as Thumbellina.

We can notice, from the analysis of the two haiku poems, how the reader-response approach (Mart, 2019) was used by the author of the present paper. According to this approach, we have emotional reactions, and we are also prompted to interpret based on our life experience and cultural background any text. The haiku poem, however, more than other works, specifically is about an established dialogue between author and reader, and presents the reader with an interactive experience. The reader has to participate actively in creating the meaning of a haiku poem. Additionally, the meaning of haiku poems can vary from one reader to another.

RESULTS

The present paper can show how juxtaposition, a frequently mentioned and studied device in haiku poems, works by providing the explanation based on the game going on between the figurative and literal meaning, between concrete reality and abstract elements and ideas, suggested by a word or phrase, with a strong charge that can prompt free associations. Free association are a mechanism which is common to the way our minds work, from a psychoanalytic point of view. This mechanism can also be at work in understanding and assigning meaning to symbol, at both cultural and personal level. A symbol, just like any word or image in a haiku poem, can be further on expanded into details of all kinds. It is very concise and can be considered as a recognizable image or sign that stands for something else (Baciu, 2012). We constantly create symbols and interpret them through associations, since this is the natural way in which the human mind works.

Through the analysis of two poems by Șerban Codrin, the present paper has shown how the haiku poems can be understood, interpreted and written. Understanding the way haiku poems work is an ongoing process, and it is best achieved by looking as specific examples.

We cannot draw clearly-cut conclusions about the haiku poem by delimiting and defining a particular way in which it was practiced in the past and the way it is practised now. We may have the same experiences, throughout history, as we are human beings functioning in similar ways throughout our life stages. We can see how we react to the autumn season, and how we associate it with the end of life, and with philosophical reflections. We can also see how we understand the fascination with new beginnings and new life, in the poem with the seeds. In both poems, the reality is highlighted and made special in its details presented, through the game between literal and figurative meaning.

We may expect readers to be the ones to seek the figurative meaning in a poem, yet in these two poems the figurative meaning is already, to some extent present. Still, this does not take anything away from the charm of the poem and it sets further challenges, even if this can be hard to believe. We have seen the interpretations which can rise based on two different translations.

DISCUSSION AND CONCLUSIONS

The haiku poem, as it is functioning based on associations, which are natural to the way our human mind works, can be understood in relation to the way external reality items can suggest both to us authors and to readers similar ideas, emotional states, and experiences.

The present paper shows how we may not need to look at dictionary definitions and rules for haiku poems, as we can interpret them naturally, ourselves, based on our general background on Zen Buddhist beliefs, which are understandable by us all and popularized, since they are part of the soft power of Japan. Soft power (Nye, 2017; Nye, 2021) means cultural products which can be promoted and have an appeal to members of other cultures.

The analysis of the two poems by Șerban Codrin by the author of the present paper shows how several layers of meaning can arise from the game between literal and figurative meanings. These meanings can be present both in a haiku poem, and, as we have seen, they can lead, through free associations based on key elements which act as symbols, towards new and new understandings and interpretations. We can find ourselves reflecting over a haiku poem over and over and discover additional meanings, based on further life experiences we can have or further discussions they can have with other readers. The richness of meaning and the depth of meaning in apparently simple, descriptive and short poems about nature is made visible by the analysis of the two poems by Șerban Codrin selected in the present paper.

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**CONFLICTS BETWEEN THE OTTOMAN STATE AND RUSSIA IN THE IZMAIL
FORTRESS IN THE 18TH CENTURY**

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ABSTRACT

Izmail Fortress, which has been under the domination of the Ottoman State since the end of the 16th century, has played a role in the Black Sea and Danube River strategies of the Ottoman State for approximately three hundred years and has increased its importance over time, has not survived to the present day, the region of the fortress is in the Odessa oblast of Ukraine as the name of “Park of Suvorov”.

Izmail Fortress was occupied by the Russians in 1770, during the Ottoman-Russian War between 1768-1774, and remained under Russian rule until the implementation of article 16 of the Treaty of Küçük Kaynarca signed in 1774. During the Ottoman State and Russia-Austria Wars between 1787-1792, it was invaded by the Russians again on 22 December 1790, and with the Treaty of Iasi signed in 1792, it came under the administration of the Ottoman State again.

As a result of increasing Russian pressure in the 19th century, like other Ottoman fortresses on the Danube and the Black Sea that disposed of one by one, Izmail Fortress also came under Russian rule and it was decided to be demolished in accordance with the Treaty of Paris in 1856. The region, which was permanently transferred to the Russian administration with the Treaty of Berlin signed in 1878, was then transferred to the administration of Soviet Russia and was given to the administration of the Ukrainian Republic after 1944.

In this paper, the Turkish-Russian struggle over the Izmail Fortress in the 18th century is discussed following the chronological order based on archival documents obtained from the Presidency of the Republic of Türkiye, Directorate of State Archives, the Ottoman Archive (BOA).

Keywords: Izmail, Fortress, Ottoman State, Russia, Conflicts

Introduction

Izmail Fortress is a castle in the city of Izmail, Odesa oblast, in what is now the Republic of Ukraine, but no longer exists. This fortress, which is very close to the Romanian border, was under the rule of the Ottoman State for nearly 300 years. Due to its sea and land connections with the Danube and the Black Sea, it played an important role in the transportation of supplies, ammunition and troops. Through Izmail Fortress, military and ammunition support was provided to other Black Sea and Danube fortresses of the Ottoman State such as Braila, Belgorod Dnestrovsky, Tighina, Chilia and Isaccea fortresses. It also contributed significantly to the various needs of Istanbul, such as soldiers

and agricultural supplies. On the other hand, Izmail Fortress was also utilized as a recruitment center for the Ottoman State's western campaigns.

The region where Izmail Fortress is located was annexed to Ottoman territory in 1484, during the reign of Sultan Bayezid II, with the Chilia and Belgorod Dnestrovsky campaigns against Stefan cel Mare. In 1538, as a result of Sultan Suleiman the Magnificent's campaign in Moldavia, the Ottoman borders expanded towards Tighina. Thus, the development of Izmail, located in the corridor connecting Istanbul to the Black Sea and the Danube, became a necessity. Izmail Fortress, which developed rapidly after the Moldavia Campaign, became an important garrison center in 1595. In time, threats from the Russian, Nogai, Polish and Cossack forces from the north emerged in and around Izmail and the need to take security measures against them arose. This strategic region, which was previously seen as a passage or a palanka, was assigned to the Habeshi Mehmed Aga in 1589 and efforts were made to revitalize the region with the “*İsmail Geçidi*” Foundation established in 1590.¹

Izmail Fortress was subjected to Cossack attacks and destroyed in 1602-1603 and 1624. In May 1602, the Poles, under the leadership of Zamoyski, also threatened the Izmail Fortress as they marched through Moldavia. Between 1681-1684, Nogai groups living in Izmail exhibited insecure behavior in the region. This development caused tensions between the Voivodeship of Moldavia, the Crimean Khanate and the Ottoman State. Crimean Giray, one of the Tatar mirzas, made an agreement with the Nogai and took a stand against the Ottoman Empire. However, this tension did not last long.² Izmail Fortress appears to have been part of the support network organized in 1695 for the protection of Kamyanets Fortress, along with the surrounding fortresses of Varna, Mangalia, Balchik, Struma, Chilia, Izmail, Tulcea, Braila, Macin, Babadag, Isaccea, Belgorod Dnestrovsky.³ In 1696, Izmail Fortress similarly supported the Azov Fortress in terms of supplies⁴, and in 1699, he provided wheat for the Ochakiv Fortress.⁵

Conflicts Between The Ottoman State And Russia In The Izmail Fortress In The 18th Century

In the 18th century, the Ottoman State's relations with Russia and Austria gradually deteriorated. For this reason, the military importance of Izmail Fortress increased and it became a military defense base. Along with the other fortresses in the vicinity, Izmail Fortress necessarily played a more active role in the wars and came to the fore for strategic reasons. Among the fortresses that took part in the functioning of the defense organization in the struggles against Russia and Austria in this period, along with Izmail Fortress; Belgorod Dnestrovsky, Azov, Belgrade, Tighina, Gladova, Harsovo, Khotyn, Braila, Kamyanets, Caraharman (Vadu), Feodosia (Caffa), Kinburn, Chilia, Macin, Nikopol, Ochakiv, Ruse, Smederovo, Silistra, Temesvar, Tatarbunary, Tutrakan, Tulcea, Varna, Vidin, Yanık

¹ Aurel Decei, “İsmail”, *IA*, MEB, 1978, Vol. 5/2, p. 1109-1110; Feridun Emecen, “İsmâil” *DIA*, Istanbul, TDV Press, 2001, Vol. 23, p. 82-84; Mehmet Akif Erdogru, “Tuna Sahilinde On Altıncı Yüzyılda Kurulmuş Bir Osmanlı Yerleşimi: İsmail Geçidi Kasabası”, *Vakıflar Dergisi*, 80. Yıl Özel Sayısı, Ankara, Vakıflar Genel Müdürlüğü, 2019, p. 189-195, 202, 203; Reyhan Aytaç “66 Numaralı (H. 997-998 / M. 1589-1590) Mühimme Defteri (İnceleme Metin)”, *Marmara University Institute of Turkic Studies, Department of Turkish History*, Modern History Department, M.A. Dissertation, Istanbul, 2014, p. 16, 17, 23, 40, 57, 58; Mehmet Tutuncu, Andrew Krasnozhan, *İsmail Şehri ve Kaleleri (XVI-XIX. Yüzyılların Belgelerinde) (Izmail City and Its Fortifications (By the Sources of 16th-19th Centuries))*, Odesa, Chernomor’e Press, 2019, p. 19-36, 179, 180, 546.

² Decei, *Ibid.*, p. 1109; Raşit Çoluglu, “Temettüât Defterleri Çerçevesinde İsakça Kasabası’nın İktisadî ve Sosyal Yapısı (1844 -1845)”, Prof. Dr. Ahmet Tabakoğlu, *Marmara University Institute of Social Sciences* Department of History of Economics, M.A. Dissertation, Istanbul, 2010, p. 20; A. B. Şirokorad, *Osmanlı-Rus Savaşları*, Selenge, Istanbul, 2009, p. 52.

³ BOA. A.DVNSMHM.d. 106-1420 M (H. 20.05.1107/G. 27 December 1695).

⁴ BOA. İE.AS. 47-4288 (H. 25.02.1108/G. 23 September 1696).

⁵ BOA. C.AS. 43-1994 (H. 14.08.1110/G. 15 February 1699).

Hisar (Yanikkale, Győr), Giurgiu and Svistov.⁶ Of these, the fortresses of Belgorod Dnestrovsky, Chilia and Izmail were used as strategic fortresses in defense against Russian attacks from Crimea and the Northern Black Sea.⁷

On June 27, 1709, after suffering a heavy defeat against Russian Tsar Peter I at the Battle of Poltova, King Charlemagne of Sweden sought refuge in the Ottoman State and stayed in Tighina Fortress for five years. During this period, security measures were increased in Tighina Fortress and other fortresses in the vicinity, including Izmail. For this purpose, gunpowder was sent to Tighina Fortress from Izmail Fortress, Vidin and Giurgiu fortresses from Braila port, Khotyn Fortress from Galati port, and Ochakiv and Belgorod Dnestrovsky fortresses directly from Istanbul.⁸

The years 1710-1711 were the years of the Pruth River Campaign between the Ottoman State and Russia. Russia's aim was to weaken the Ottoman State by provoking the Orthodox in the Ottoman State. In this way, Russia wanted to regain the lands of Bugeac, including Izmail Fortress, which it had previously lost. For these purposes, Russia provoked the voivodes of Wallachia and Moldova. Moreover, Russia raided the Ottoman borders due to King Charlemagne of Sweden, who fled from Russia in 1709 and sought refuge in the Ottoman State. Eventually, the Ottoman State declared war on Russia in 1710 by order of Sultan Ahmed III. In July 1711, the Russian army besieged and captured Braila. Grand Vizier Baltacı Mehmet Pasha crossed the Danube at Isaccea with a large army and then headed towards Azov and Crimea. While the peace negotiations between the two sides were ongoing, in 1711, supplies for soldiers were shipped from the fortresses of Chilia and Izmail to various fortresses, especially Tighina.⁹

With the Treaty of Pruth signed in 1711, Azov Fortress, which had been lost in 1700 with the Treaty of Constantinople, was returned to the Ottoman State.¹⁰ Throughout this period, Izmail is thought to have been an important military training ground.¹¹

On November 28, 1769, with the provocation and support of Russia, a rebellion broke out in Moldova. In order to suppress the rebellion, janissaries from the Danube and Black Sea coasts and 50-60 thousand Tatars were gathered by the Crimean Khan and attacked the rebelling Moldavian and Russians. Soldiers were also sent to Isaccea, Izmail and Macin to be under the command of the Seraskier of the Moldova, and they were ordered to take revenge on the rebels.¹²

The direct developments between the Ottoman State and Russia over the Izmail Fortress begin with the 1768-1774 War. During the war between the Ottoman State and Russia between 1768-1774, Izmail Fortress was occupied by the Russians in 1770. The commander of the Russian army was P. Rumyantsev. It is believed that during the occupation, the Christian population of Izmail helped the Russian troops under the command of P. Rumyantsev, while the Muslim population evacuated without a fight.¹³ However, for the defense of Izmail Fortress, various ammunition was sent from Tighina and large shahi cannons, humbars, rounds and ammunition were sent to the Izmail pier from Istanbul. Since these supplies were left exposed in Izmail, they were transported to Tighina.¹⁴ In addition, Islamic troops also moved to Izmail.¹⁵ All this ammunition and troops may have been delayed in reaching Izmail Fortress. Therefore, the Muslim population of Izmail may have been

⁶ Mahir Aydın, *Vidin Kalesi Tuna Boyundaki İnci*, Ötüken Press, Istanbul, 2015, p. 32.

⁷ Oya, Şenyurt, "III. Selim Döneminde İnşaat Ortamını Yönlendiren İki Fransız Mühendis ve Kale Tamirleri, *Tarih İncelemeleri Dergisi*, Izmir, 2013, Vol. 28/2, p. 487-521, p. 488.

⁸ BOA. C.AS. 914-39469 (H. 29.11.1120/G. 9 February 1709).

⁹ BOA. İE.DH. 22-1995 (H. 23.04.1123/G. 10 June 1711); BOA. İE.DH. 27-2389 (H. 02.07.1123/G. 16 August 1711).

¹⁰ Kemal Beydilli, "Prut Antlaşması", *DİA*, Istanbul, 2007, Vol. 34, p. 359-362.

¹¹ Decei, *Ibid.*, p. 1109.

¹² BOA. AE.SMST.III. 332-26816 (H. 29.07.1183/G. 28 November 1769).

¹³ Emecen, *Ibid.*, p. 82-84.

¹⁴ BOA. C.AS. 531-22210 (H. 17.11.1183/G. 14 March 1770).

¹⁵ BOA. TS.MA.e 758-18 (TSMA No: 6518/1) (H. 29.12.1183/G. 25 April 1770).

forced to evacuate the castle before the reinforcements arrived. During this war, Tighina suffered from a shortage of provisions. Attempts were made to procure it from nearby places such as Chilia, Izmail and Khan Hill. As a result of the insufficient supply, approximately 5000-6000 soldiers deserted towards Cauşeni and Izmail.¹⁶ Izmail may have been a rallying point during this battle, or the last staging area before the rallying point. However, when the resources in the castle were not sufficient to meet the needs of the assembled troops, they were transferred to the Isaccea side.¹⁷ Izmail Fortress, whose defenses were inadequate, was overrun by the Russians, and this news was reflected in the correspondence of August 22.¹⁸

On September 2, 1770, in the battle fought between the forces of Russia and the Ottoman State on the field of Cagul, the Ottoman army retreated. This battle is known as the Battle of Cagul Defeat. Fleeing from the battle, the soldiers abandoned their weights and came from Cagul to the Danube coast. Most of the approximately 40,000 soldiers who could not cross the Danube went to Izmail. However, the Russians captured Izmail and Chilia fortresses and besieged Tighina Fortress.¹⁹ After occupying Izmail Fortress, the Russian commander Field Marshal Count Romanzof sent a letter to Grand Vizier Halil Pasha and offered peace. Nevertheless, the Russian troops on the Izmail side continued their advance towards Tulcea and withdrew after destroying Babadag. With article 16 of the Treaty of Kuchuk Kainarji signed in 1774, the Bessarabia region, including the Izmail Fortress, reverted to the Ottoman State. Turkish prisoners in Petersburg were sent to Tighina while the Treaty of Kuchuk Kainarji was being concluded, and some of these prisoners were sent from Tighina to Izmail.²⁰ After the Treaty of Kuchuk Kainarji, Sultan Selim III ordered the strengthening of other fortresses in the region and the Izmail Fortress. As a result, Izmail Fortress became the strongest Turkish fortress north of the Danube. It was even recognized as an "army fortress" and was considered to be impregnable.²¹

From 1780 onwards, it is known that Izmail Fortress was again subjected to fortification activities. In fact, with these reinforcements, Izmail Fortress is considered to be the main military base in the region. The reason for this reinforcement was the continued Russian threat around the castles of Khotin, Tighina, Ochakiv, in Wallachia and Moldova, and in Bugeac.²²

In 1787, the Ottoman State's relations with Russia deteriorated again. Russia violated the Treaty of Kuchuk Kainarji and sent troops to Crimea. Upon this development, ammunition and cereals were provided and preparations were made for the troops gathered in Izmail.²³ According to the news that reached Izmail Fortress on September 10, 1787, war had been declared against Russia.²⁴ It was ordered to gather all troops for the campaign against Russia and to fortify all fortresses and palangas.²⁵ Gunpowder from the Varna arsenal²⁶ and ammunition from the Istanbul²⁷ were transported to Izmail Fortress. Three warehouses were built at Izmail Fortress for the storage of artillery ammunition.²⁸ Meanwhile, Vizier Ali Pasha was the Commander of the Russian Campaign.²⁹ During the campaign, some of the Izmail army fled. The fleeing cavalry and infantry were captured

¹⁶ Cengiz Fedakar, *Bender Kalesi (1768-1774)*, Istanbul, Kitabevi Press, 2019, p. 36, 41, 47.

¹⁷ BOA. TS.MA.e. 477-10 (TSMA No: 1891/37) (H. 14.04.1184/G. 7 August 1770).

¹⁸ BOA. C.AS. 1179-52531 (H. 29.04.1184/G. 22 August 1770).

¹⁹ BOA. TS.MA.e. 701-11 (TSMA No: 4731/1) (H. 11.05.1184/G. 2 September 1770).

²⁰ Fedakar, *Ibid.*, p. 61, 65, 68.

²¹ Decei, *Ibid.*, p. 1109; Kemal Karpat, "Bucak" *DIA*, Istanbul, TDV Press, 2001, Vol. 6, p. 342, 343.

²² Emecen, *Ibid.*, p. 82-84.

²³ BOA. MAD.d. 3115 (H. 01.11.1201/G. 15 August 1787); BOA. C.AS. 1146-50916 (H. 05.11.1201/G. 19 August 1787).

²⁴ BOA. C.HR. 80-3975 (H. 27.11.1201/G. 10 September 1787).

²⁵ BOA. C.AS. 890-38280 (H. 29.11.1201/G. 12 September 1787).

²⁶ BOA. C.AS. 905-39032 (H. 29.11.1201/G. 12 September 1787).

²⁷ BOA. AE.SABH.I. 205-13631 (H. 11.01.1202/G. 23 October 1787).

²⁸ BOA. C.AS. 222-9443 (H. 09.05.1202/G. 16 February 1788).

²⁹ BOA. C.AS. 933-40400 (H. 29.09.1202/G. 3 July 1788).

by Tayfur Pasha, who was in charge of troop dispatch, and were first imprisoned in Edirne Fortress, and then sent back to the army together with Tayfur Pasha.³⁰ About 1000 soldiers of the fourth company in Isaccea were also assigned to the Izmail army.³¹

Between 1787-1792, the Ottoman State was at war with Russia and Austria. Although Austria withdrew from the war, the war with Russia continued for a while. For Izmail Fortress, the years 1789 and 1790 were the most critical years of the war. First, Ochakiv Fortress was besieged by the Russian commander Suvorov and then occupied in 1789.³²

With the capture of the Ochakiv Fortress by the Russians, the military importance of the Izmail Fortress increased even more.

Izmail Fortress was besieged from the north on August 22, 1789 under the command of Prince Repnin. The first siege line consisted of 63 artillery batteries; the second siege line consisted of 7 infantry regiments of 4 battalions each in a square formation; and the third siege line on the front and flanks consisted of 17 various regiments and 3 infantry squares with four guns each. On September 12, during the Russian attack, the defense of Izmail Fortress was undertaken by Cezayirli Hasan Pasha. Despite a breach in the fortification wall as a result of the Russian bombardment, the Russians retreated and the siege was lifted.³³ On September 20, the Russian raid on Izmail was again repulsed.³⁴ On September 25, 13,000 Russian soldiers attacked Izmail Fortress, but two cannons were taken from the Russians during the defense of the fort and the attacks were repelled.³⁵ On October 12, Baht Giray Khan was assigned with his troops to the defense of Izmail Fortress and sent 15,000 piastres for his expenses.³⁶ While the Russian attacks continued, various construction and repair works continued in Izmail Fortress.³⁷

The warning in the November 20 document is important as it shows that the European states would turn a blind eye to the Russian threat against the Ottoman State. Here, it was clearly stated that all Europeans, who appeared to be friends and enemies of the Ottoman State, aimed not to leave the Ottoman State in Rumelia. For this reason, it is stated that there was no other option but to provide the necessary troops, food and all repair needs for the fortresses.³⁸

On November 21, Tayfur Pasha, the guard of belgorod Dnestrovsky, arrived in Izmail because of the Russian attack. However, the fortresses of Tighina and Izmail did not have enough troops and supplies. Meanwhile, there were 70,000 Russian troops in the vicinity of Tighina. Cezayirli Hasan Pasha informed that help was needed against these Russian troops, that the army's power of endurance was broken and that the situation would become dire if a truce was not made.³⁹

On December 7, 1789, the Russians attacked the Izmail Fortress.⁴⁰ To reinforce the castle guards, 50 soldiers and 15,000 kurus were sent from Yenipazar under the command of Kaplan Giray Sultan, the brother of the Crimean Khan⁴¹, and reinforcements came from Kozluca.⁴² On February 28, 30 divisions of large and speed cannons, various tools, rounds and ammunition were delivered to Izmail

³⁰ BOA. C.AS. 502-20968 (H. 07.10.1202/G. 11 July 1788).

³¹ BOA. C.AS. 1041-45687 (H. 29.10.1202/G. 2 August 1788).

³² BOA. HAT 1451-15 (H. 15.05.1203/G. 11 February 1789).

³³ Tutuncu, Krasnozhon, *Ibid.*, p. 339-342.

³⁴ BOA. HAT 964-41264 A (H. 29.12.1203/G. 20 September 1789).

³⁵ BOA. HAT 146-6138 (H. 05.01.1204/G. 25 September 1789).

³⁶ BOA. C.HR. 125-6209 (H. 22.01.1204/G. 12 October 1789).

³⁷ BOA. C.AS. 1189-53107 (H. 22.01.1204/G. 12 October 1789).

³⁸ BOA. HAT 256-14615 (H. 02.03.1204/G. 20 November 1789).

³⁹ BOA. TS.MA.e. 434-68 (TSMA No: 1321/1) (H. 03.03.1204/G. 21 November 1789).

⁴⁰ BOA. C.AS. 400-16507 (H. 19.03.1204/G. 7 December 1789).

⁴¹ BOA. C.AS. 220-9389 (H. 22.03.1204/G. 10 December 1789); BOA. C.DH. 105-5212 (H. 13.05.1204/G. 29 January 1790).

⁴² BOA. C.AS. 699-29315 (H. 22.03.1204/G. 10 December 1789).

Fortress⁴³; on March 10, sufficient ammunition, artillerymen and 5 divisions of cannons were sent to the fortress⁴⁴; and on April 13, 200 soldiers organized from Provadia were sent to the fort for reinforcement.⁴⁵

On April 14, 1790, there is a record of the death of Vizier Cezayirli Gazi Hasan Pasha. In his place, Vizier Hasan Pasha, the guard of Ruse, was temporarily assigned to the defense of Izmail.⁴⁶ On April 26, the janissaries remaining in Istanbul were asked to reinforce the Izmail army, and those who did not understand war were ordered to be replaced by men who could fight for a fee.⁴⁷ The Kuban Khan Baht Giray Khan will go to the support of Izmail Fortress with the troops he will supply.⁴⁸ Cavalry and infantry soldiers will be sent from Shumen and Ruse to Izmail Fortress.⁴⁹ Even though it is September, it is a severe winter and the fortress is in disrepair, which has cost a lot of money to repair.⁵⁰ In the meantime, Izmail's needs are met from Bergos⁵¹.⁵² Support was also requested from the soldiers on the Babadag side of the Izmail Fortress⁵³, and various ammunition was sent from Isaccea.⁵⁴ On November 7, 1790, news reached Chilia Fortress that it was besieged and attacked by the Russians.⁵⁵ A few days later, the Russian attacks on Fortress Izmail became irresistible.

On December 3, 1790, Russian ships sailed from Isaccea to Tulcea and attacked Izmail Fortress from Chilia with cannon fire.⁵⁶ Soldiers from Anatolia and Rumelia were requested to be sent to support Izmail Fortress.⁵⁷ The siege of Izmail Fortress by Russian troops lasted until December 11, 1790 and the fortress fell to the Russians as a result of the siege. The fall of Izmail Fortress to the Russians is thought to have been caused by the architect of Izmail Fortress who betrayed the Tighina Gate, the weakest point of the castle, to the Russians. There is no definite information about engineer Kauffer's political relationship with the Russians, but it is known that he later shared his work with the Russians.⁵⁸

According to the report submitted by Suvorov to G. A. Potemkin on December 13, 1790, the Russians carried out the siege of Izmail with land and naval forces. In total, about 5000 people, including some 3000 pashas and officials, were taken prisoner by Russian troops and the rest lost their lives. After being held for more than a month, the captives would be sent to Tighina in groups. During the siege, Russian troops were ordered never to harm Christians and unarmed people, women and children. During the siege, an ultimatum was sent to Seraskier Aydoslu Mehmet Pasha and he was asked to surrender the fortress to the Russians. They were informed that if they did not surrender to the Russians, the Turkish troops would be held responsible for the deaths that would occur in the

⁴³ BOA. C.AS. 827-35233 (H. 13.06.1204/G. 28 February 1790).

⁴⁴ BOA. C.AS. 846-36165 (H. 23.06.1204/G. 10 March 1790).

⁴⁵ BOA. C.AS. 166-7268 (H. 28.07.1204/G. 13 April 1790).

⁴⁶ BOA. AE.SSLM.III. 74-4461 (H. 29.07.1204/G. 14 April 1790).

⁴⁷ BOA. C.AS. 848-36244 (H. 11.08.1204/G. 26 April 1790).

⁴⁸ BOA. C.AS. 816-34670 (H. 29.11.1204/G. 10 August 1790).

⁴⁹ BOA. C.AS. 130-5783 (H. 17.12.1204/G. 28 August 1790).

⁵⁰ BOA. AE.SSLM.III. 264-15295 (H. 29.12.1204/G. 9 September 1790).

⁵¹ Bergos, which is mentioned here as the place where Izmail was sent with provisions, must be Bergos in Bulgaria. See: Tahir Sezen, *Osmanlı Yer Adları*, Ankara, T.C. Başbakanlık Devlet Arşivleri Genel Müdürlüğü, No: 26, 2017, p. 15, 109, 775.

⁵² BOA. HAT 1391-55507 (H. 29.12.1204/G. 9 September 1790).

⁵³ BOA. C.AS. 224-9511 (H. 05.02.1205/G. 14 October 1790).

⁵⁴ BOA. AE.SSLM.III. 117-7124 (H. 25.02.1205/G. 3 November 1790).

⁵⁵ BOA. C.AS. 203-8717 (H. 29.02.1205/G. 7 November 1790).

⁵⁶ BOA. HAT 146-6147 (H. 26.03.1205/G. 3 December 1790).

⁵⁷ BOA. C.AS. 177-7688 (H. 29.03.1205/G. 6 December 1790); BOA. C.AS. 115-5172 (H. 29.03.1205/G. 6 December 1790); BOA. C.AS. 180-7820 (H. 29.03.1205/G. 6 December 1790); BOA. C.AS. 277-11519 (H. 29.03.1205/G. 6 December 1790).

⁵⁸ Şenyurt, *Ibid.*, 2013, p. 509, 510; BOA. C.AS. 176-7662 (H. 03.07.1211/G. 2 January 1797); BOA. HAT 183-8491 (H. 29.12.1204/G. 9 September 1790).

fortress, and that all civilians, women and children alike, would be killed by the angry soldiers. On the orders of Prince Potemkin, Prince Suvorov and the Russian troops under his command entered Izmail and destroyed the entire fortress for 3 days, slaughtering the soldiers and Muslim population. The Russian army at the Seret River massacred the men and enslaved the women despite the surrender of the fortress. Approximately 30,000 Ottoman soldiers and civilians in the fortress lost their lives. It is estimated that around 9000 non-Muslims were captured by the Russians and taken to Russia. The Russian army also suffered around 12,000-15,000 casualties. Due to the occupation of Izmail Castle, Abdi Pasha, the Ottoman State's vizier in the region, was executed by order of Sultan Selim III. On August 4, 1791, the Treaty of Sistova was signed between the Ottoman State and Austria. According to the treaty, Austria returned the lands it had taken from the Ottoman State during the war and guaranteed that it would not help Russia. Despite the peace with Austria, the war with Russia continued for a while. With the Treaty of Jassy signed on January 10, 1792, the war between Russia and the Ottoman State came to an end. According to the articles in the Treaty of Jassy, the Dniester River was accepted as the border and Ochakiv and Khojabey on the left side of the river were left to the Russians. Anapa, Tighina, Belgorod Dnestrovsky, Chilia, Izmail and other Russian-occupied fortresses and cities on the right side of the river were returned to the Ottoman State. Thus, Russia became much stronger in the Black Sea, and the Russian threat reached as far as Istanbul.⁵⁹ On June 20, work began on the repatriation of the people of Sogucak, Anapa, Chilia, Belgorod Dnestrovsky, Khotin and Izmail, who had been scattered in various places during the war.⁶⁰

The Ottoman State assigned Keller, a British engineer with the rank of general, to carry out reconnaissance and repairs in the fortresses of Khotin, Tighina, Belgorod Dnestrovsky, Izmail, Braila and Chilia, which were taken back from the Russians in 1792.⁶¹ In 1793, Hadji Numan Bey was appointed as the building supervisor of Izmail Fortress⁶² and the fortification activities at Izmail Fortress continued between 1794 and 1797.

Some of the Armenians who had been taken captive during the occupation of the fortress by the Russians escaped and came back to Izmail.⁶³ In order to rebuild Izmail, it was decided to transfer 1000 households from Wallachia and the people who had fled to Moldova during the occupation were asked to return to their homes.⁶⁴ During this period, in order to strengthen Tulcea and protect the Izmail Fortress, it was deemed appropriate to resettle people from the Crimean frontiers and muhajirs (migrants) in Izmail.⁶⁵

In 1798 and 1799, a large number of soldiers were supplied to the fortresses of Izmail, Tighina, Khotin and Ochakiv and sent to the borders against the approaching Russian threat in the following years.⁶⁶ Despite this, the Russians were unable to prevent the reoccupation of Izmail Fortress in 1809.

As a result, Izmail Fortress played an important role in the military operations of the Ottoman State in the eighteenth and nineteenth centuries, especially against Russia. In 1770 and 1790, the fortress was directly occupied by the Russians, but it was returned to the Ottoman State with the Treaty of Iasi in 1792. Between 1794 and 1797, the Ottoman State made a major attempt to strengthen the fortress. In 1809, Izmail Fortress was again occupied by the Russians, and as a result of the Treaty of

⁵⁹ Tutuncu, Krasnozhan, *Ibid.*, p. 345-347, 371-374, 392-397, 540, 541; Akdes Nimet Kurat, *Türkiye ve Rusya*, Kültür Bakanlığı/1194, Kültür Eserleri 150, Ankara, Sevinç Press, 1990, p. 37; Decei, *Ibid.*, p. 1109; Emecen, *Ibid.*, p. 82-84; Karpat, *Ibid.*, p. 342, 343; BOA. HAT 146-6179 (H. 25.04.1205/G. 1 January 1791).

⁶⁰ BOA. C.HR. 42-2073 (H. 29.10.1206/G. 20 June 1792).

⁶¹ BOA. C. AS. 378-15650 (H. 14.11.1206/G. 4 July 1792); BOA. C. AS. 80-3773 (H. 29.12.1206/G. 18 August 1792); BOA. C.AS. 278-11541 (H. 24.07.1207/G. 7 March 1793).

⁶² BOA. C.AS. 365-15125 (H. 24.05.1207/G. 7 January 1793).

⁶³ BOA. C.AS. 826-35167 (H. 07.07.1207/G. 18 February 1793).

⁶⁴ BOA. C.DH. 32-1561 (H. 29.01.1209/G. 26 August 1794); BOA. C.HR. 12-599 (H. 10.02.1209/G. 6 September 1794).

⁶⁵ BOA. C.DH. 274-13658 (H. 09.08.1208/G. 12 March 1794); BOA. C.DH. 97-4822 (H. 21.08.1208/G. 24 March 1794).

⁶⁶ BOA. C.AS. 116-5202 (H. 29.01.1204/G. 19 October 1798); BOA. C.AS. 116-5208 (H. 29.01.1204/G. 19 October 1798); BOA. TS.MA.e. 500-34 (TSMA No: 2194/1) (H. 03.08.1214/G. 31 December 1799).

Bucharest signed in 1812, it was under Russian rule. In 1856, Izmail Fortress and many buildings around the fortress were destroyed by the Russians. After the Treaty of Berlin in 1878, the region where Izmail Fortress is located was permanently out of Ottoman rule. The fortress area was then administered by Romania and Soviet Russia respectively. Today, the city of Izmail in Odessa oblast is administered by the Republic of Ukraine.

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LONELINESS AND SOCIAL SUPPORT IN OLDER ADULTS

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Abstract

Increasing life expectancy has led to an increase in the elderly population, making social isolation even more important. Today, the replacement of the extended family by the nuclear family has resulted in the elderly being deprived of family and social support resources and left to cope with their own problems. In order to increase the quality of life and psychological well-being of the elderly population, social support systems should be taken into consideration and the elderly should be encouraged to participate in social activities. Support from family, relatives, neighbors and friends in solving the material and moral problems of the elderly will contribute to making life easier by enabling them to cope more easily with the difficulties of social life and to struggle more with all the difficulties of life. Staying away from both professional life and social environment pushes the individual to loneliness and social isolation, while increased social support increases life satisfaction. An important way to improve social support is to prevent social isolation and loneliness.

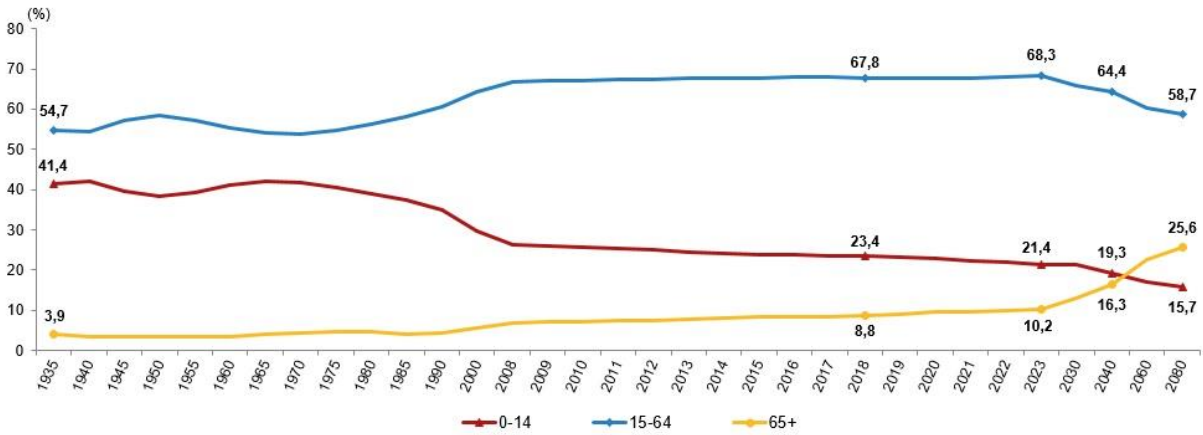
Keywords: Older adults, Loneliness, Social support.

Introduction

The increase in life expectancy and the decline in birth rates led to an increase in the proportion of the elderly population in the general population at the end of the twentieth century (Barker, 1998; 271; Peters, Nusselder, Reibling, Wegner-Siegmundt, & Mackenbach, 2015, p. 1). According to the United Nations world population estimates for 2023, the world population was estimated to be 8 billion 45 million 311 thousand 448 people and the elderly population was estimated to be 807 million 790 thousand 294 people. According to these estimates, the elderly population constituted 10.0% of the world population. The top three countries with the highest proportion of elderly population were Japan with 30.1%, Italy with 24.5% and Finland with 23.6%. Turkey ranked 67th among 184 countries. According to TUIK (2024), the elderly population in Turkey increased by 58.6% in the last decade from 5 million 327 thousand 736 people in 2010 to 8 billion 45 million 311 thousand 448 people in 2020. Population projections also predict that the elderly population will continue its upward trend (Bulletin on Elderly Population Statistics, 2020).

It is estimated that people aged 65 and over will increase from 6% to 16% of the world population by 2050. Globally, the number of elderly people, currently 703 million, is expected to more than double in the next 30 years, reaching 1.5 billion people in 2050 and 21 million in Turkey (UNDESA, 2019, p.47). Thanks to the increase in the quality of living conditions, advances in the field of medicine, easier access to medical care, improvements in health care and nutrition, people have the chance to live longer. Especially in developed economies in the world and in our country, the population is increasing rapidly, while the proportion of children and young people in the population is decreasing, the proportion of the elderly population in the total population is increasing (Arpacı & Gürbüz, 2012, p.48; Arpacı & Ersoy, 2009, p.88).

The population aged 65 and over, which is considered as the elderly population, increased by 21.4% in the last five years from 7 million 186 thousand 204 people in 2018 to 8 million 722 thousand 806 people in 2023. The proportion of the elderly population in the total population increased from 8.8% in 2018 to 10.2% in 2023. In 2023, 44.5% of the elderly population was male and 55.5% was female. According to population projections, the proportion of elderly population was projected to be 12.9% in 2030, 16.3% in 2040, 22.6% in 2060 and 25.6% in 2080 (TUIK, 2024).



Kaynak: TUIK (2024).

When the elderly population is analyzed by age group, 62.2% of the elderly population was in the 65-74 age group, 28.6% in the 75-84 age group and 9.2% in the 85 and over age group in 2018, while 64.0% was in the 65-74 age group, 28.1% in the 75-84 age group and 7.9% in the 85 and over age group in 2023 (TUIK, 2024).

Although the increase in the elderly population is an indirect indicator of the improvement in the health status of the society, it also brings along some new problems. Health care, personal care, housing care and social communication are listed as the four main needs of old age (Durgun & Tümerdem, 1999, p.119). In the context of social communication, loneliness and abandonment are very important feelings for the elderly. Physical, spiritual and mental changes seen in the aging process lead to a feeling of loneliness and loneliness can be seen when the individual's relationship does not make him/her happy (Şentürk, 2018, pp.217-240).

Loneliness

Loneliness is considered as the emotional state that occurs when the ties between the individual and his/her environment are not sufficient (Peplau & Perlman, 1982, p. 278). Loneliness is defined as an unpleasant subjective state that is felt as a result of the incompatibility between the amount of friendship and emotional support desired and the amount of support one can obtain from one's environment (Blazer, 2002, p. 315). Loneliness is a condition that arises due to dissatisfaction with the quantity and quality of one's emotional and social relationships, and is generally defined as "a psychological state resulting from deprivation and inadequacy in social relationships, which does not satisfy individuals" (Öz, 2010).

Loneliness is also defined as an uncomfortable, personalized and negative condition resulting from weakness in social relationships and affects individuals physically, socio-culturally and psychologically. Loneliness is a subjective concept that contributes to various health problems in older adults, including complex chronic diseases, decreased functionality and increased risk of mortality and is accepted to exist in the individual who expresses that he/she is lonely (Theeke & Mallow, 2013; Carpenito, 2012). It is thought that the feeling of loneliness has two

dimensions. The first is social loneliness and the other is emotional loneliness. The social loneliness dimension includes the perception of social interaction as inadequate; the emotional loneliness dimension includes the feeling of weakness and rejection in establishing close relationships (Weiss, 1973). Blazer (2002, p. 315).

Although people feel loneliness for various reasons in some periods of their lives, it is seen in the literature that this situation is felt more especially in the elderly (Dykstra, 2009, p.96; Dykstra, Van Tilburg, & Gierveld, 2005, p.725). It is stated that the feeling of loneliness is felt at a serious level in those aged 65 and over, especially over the age of 75, and the rate of loneliness increases (Eshbaugh, 2009, p.13; Stone, Evandrou, & Falkingham, 2013, p.368). It is stated that the most common psychological problem in the elderly is loneliness (Lestar & Irianto, 2019, p.89). Loneliness is basically perceived as social isolation by older individuals and causes negative emotions to emerge (van Winkel et al., 2017, p.105).

One of the factors affecting the quality of life of older individuals is the perception of loneliness (Balcı-Yapalak, 2020, p. 73). The feeling of loneliness reduces the quality of life and life satisfaction of older individuals (Chou & Chi, 2005, p. 46). It has been reported that loneliness can cause depression in older people. He revealed that loneliness, especially as a result of age-related losses and difficulties, may be associated with increased levels of depression in older people. When social interaction, which is very important for older people, is limited, the feeling of loneliness increases (Danış, 2014, p. 3).

There are many factors that can cause loneliness in individuals. When the characteristics of the elderly and the elderly period are added to these factors, the situation becomes more complex and causes the elderly to feel lonely (Ryan & Paterson, 1987, p.6-11). With advancing age, family members leaving home due to education, marriage, work, loss of spouses and friends, limited relationships and dependence due to physical and mental conditions have been reported as effective factors in loneliness (Şentürk, 2018).

When the concept of loneliness in elderly individuals and the factors affecting them are examined, it is seen that facts such as the death of a spouse and/or close friends, having to leave home, retirement, economic difficulties, change or loss in social status and roles, ongoing illnesses, physical limitations, some emotional losses and needing someone else's help to meet their basic needs come to the fore (Öz, 2010, p. 211). Experiencing cognitive impairments, becoming more and more socially isolated, needing the help of a second person in daily basic tasks, losing relatives and hopelessness increase the level of loneliness in the elderly (Kurt, 2014, p. 31). Therefore, as the feeling of loneliness increases, life satisfaction decreases (Recepoğlu, 2013, p. 311).

Loneliness also causes susceptibility to anxiety and weakening in cognitive functions (Lee & Ko, 2018, p. 1351). The effects of loneliness and social isolation in the elderly are serious and increase the likelihood of dementia, depression and suicide risk (Fratiglioni et al., 2000, p.1317; Rapagnani, 2002, p.91; Silveira & Allenbeck, 2001, p.319). The feeling of loneliness arises in individuals when emotional needs such as love, being valued, attachment, affection are not met and when there is a lack of social relationships as a result of a lack of reliable relationships. When emotional and social needs are not met, individuals experience loneliness due to social and emotional isolation (Karadakovan, 2014). It is stated that aging is not only an individual but also a social phenomenon and old age loneliness is defined as a social problem and it is emphasized that loneliness among this group is a social problem (Tufan et al., 2019, p.2) due to the tendency of some older adults to isolate.

Social Support

Social support is defined as a network of interpersonal relationships that provide psychological and material support to the individual and aim to increase the coping skills of the individual. In other words, the individual feels that others are sensitive to his/her needs (Kahraman, 2010). Social support also reduces the need for commitment in individuals and increases self-confidence in the empowerment of individuals. Social support has been reported to be effective in the emergence, course and duration of diseases in individuals, physical health and well-being of the individual, and psychosocial well-being (Khorshid & Gürol, 2006).

In individuals who receive social support, dignity increases, satisfaction with life and morale increase, and individuals look at life with more hope (Li, Ji, & Chen, 2014). Social support refers to the process of managing psychological and material resources through existing social networks in increasing individuals' coping with stressful events, meeting social needs and achieving goals (Rodriguez & Cohen, 1998). In a study conducted with the elderly, it was reported that low levels of social support were associated with old age and abuse, especially psychological abuse, and that increasing social relationships (50) and frequent visits to the elderly prevented loneliness (Burholt & Scharf, 2014; Usta, 2015).

Support from family, relatives, neighbors and friends are important sources of support that not only save the elderly from loneliness but also meet their care needs (Şentürk, 2018). Support from family, relatives, neighbors, and friends in solving the material and moral problems of the elderly will contribute to making life easier by enabling them to cope with the difficulties of social life more easily and to struggle more with all the difficulties of life. Staying away from both professional life and social environment pushes the individual to loneliness and social isolation (29), while increased social support increases life satisfaction (Aydiner Boylu & Günay, 2018; Kurt, Beyaztaş, & Erkol, 2010).

An important way to improve social support is to prevent social isolation and loneliness (Kahraman, 2017). With the change in the family structure and the transformation to nuclear family, especially the elderly were exposed to loneliness, and the elderly individual pushed into loneliness had to cope with all the problems specific to old age (Akdemir, 2000). When individuals are not supported emotionally and socially, they experience loneliness and do not enjoy life, and many elderly individuals who live intertwined with society may feel lonely (Görgün Baran, 2016).

Conclusion

In addition to the decrease in birth rates in developed and developing countries, the prolongation of life expectancy at birth and in old age leads to an increase in the elderly population and its share in the total population.

With the increase in the elderly population, the issue of loneliness has come to the agenda more and it is known that loneliness is a disturbing situation for many elderly people. Loneliness, which is one of the main determinants of social well-being, is an important problem for the elderly in almost every society (Görgün Baran, 2016; Hazer & Aydıner Boylu, 2010; Kapıkıran, 2016), which can affect physical and mental health status and well-being in elderly individuals and cause the death of many individuals in old age.

Loneliness levels significantly affect the quality of life of older individuals. Activities can be organized to reduce the loneliness of older individuals. Activities to be carried out for leisure time evaluation will make a significant contribution to the socialization of individuals. The

expansion of universities known as third-age universities will contribute to individuals' socializing and making new friends while acquiring new knowledge.

In conclusion, the perception of loneliness increases with age and creates stress in individuals. According to the researches, loneliness is common among the elderly. It has also been observed that loneliness increases with age. Individuals aged 80 and over feel older than individuals aged 60-80 (Pinquart & Sorensen, 2001, p. 252). Hicks (2000, p. 15). In order to improve the quality of life and psychological well-being of the elderly population, social support systems should be taken into consideration and the elderly should be encouraged to participate in social activities. It is very important to benefit from the experiences of older people, to see them as role models and to provide opportunities to develop their potential by allowing them to participate in social activities rather than excluding them from society.

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TUİK, 2024. İstatistiklerle Yaşlılar, 2023 Yayın tarihi: 27 Mart 2024 Saat: 10:00 Sayı:53710

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**EVALUATION OF RADIOACTIVITY CONCENTRATIONS IN SOILS FROM GOLD
MINING AREAS IN EASTERN REGION, GHANA**

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Abstract

Mining has been identified as one of the potential sources of exposure to naturally occurring radioactive materials. Radioactivity at mining areas is usually higher than surrounding regions and therefore increasing the background gamma radiation levels. In this study, the activity concentration of terrestrial radionuclides was measured in soils from different locations within mining areas and the radiological risks assessed. The radioactivity concentrations of ^{226}Ra , ^{232}Th and ^{40}K in the soil samples were measured using high purity germanium gamma ray spectrometer. The activity concentrations ranged between 12.3- 29.7 Bqkg⁻¹ for ^{226}Ra , 10.2- 43.5 Bqkg⁻¹ for ^{232}Th and 42.0- 423.2 Bqkg⁻¹ for ^{40}K . Both highest and lowest ^{226}Ra and ^{232}Th levels were measured in soils collected from mining sites. Activity levels of ^{232}Th for some sample locations exceeded the world average value of 30.0 Bqkg⁻¹. Radiological risk assessment as a result of the inhalation of radionuclides in soil was conducted using parameters such as radium equivalent, gamma dose rate, annual effective dose and annual gonadal dose equivalent. The results showed that soils from the mining sites recorded high values for the evaluated radiological indices. The study also showed that some soils from farmlands, mining sites and undisturbed lands recorded annual gonadal dose equivalent values as high as 395 uSvy⁻¹ which is above the reference level of 300 uSvy⁻¹. Thus, the study indicates that miners are occupationally exposed to ionizing radiation during extraction, transportation, and processing of the gold minerals. The residents of the investigated mining areas are also exposed to ionizing radiation since several undisturbed lands and farmlands recorded high ^{232}Th activity concentrations.

Keywords: soil, health risk, radioactivity, radiation dose, mining

**EDUCATIONAL ROBOTICS: LEARNING SCENARIOS IN DISTANCE SCHOOL
EDUCATION**

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ABSTRACT

Introduction and Purpose: Distance education has infiltrated in the academic world, especially after the Covid-19 pandemic. In the evolving landscape of education, distance learning has become an essential element, requiring innovative approaches to engage students and improve learning outcomes. This paper explores the integration of educational robotics as a dynamic tool in distance education, particularly within the school education system. It presents a comprehensive description of the structure of lesson plans incorporating educational robotics tools, designed to promote an interactive learning environment specific to the field of distance education. The structure of the lesson plans is designed to facilitate the development of critical thinking, problem-solving skills, and digital literacy among students. Furthermore, the paper provides a guide on the utilization of educational robotics for remote teaching, offering educators practical strategies to implement these tools effectively.

Materials and methods: The guide addresses the challenges of distance education and demonstrates how educational robotics can bridge the gap between theoretical knowledge and practical application, making learning more accessible and engaging. Through bibliographic analysis and qualitative research, we discuss the impact of educational robotics on student engagement and learning retention.

Results: The findings suggest that the use of robotics in distance education not only captivates students' interest but also significantly improves their understanding of complex concepts.

Conclusion and Discussion: The paper concludes with recommendations for educators on integrating educational robotics into their lessons, aiming to enhance the quality of distance education and prepare students for a technology-driven future.

Key words: Educational robotics, Distance Education, School education, lesson plans

INTRODUCTION

Educational Robotics revolutionized the learning landscape by equipping children with essential tools and skills and preparing them for a future where AI and robotics are integral to their lives. One powerful approach to integrating educational robotics is through distance education, which offers several advantages for learners, educators, and institutions. The teaching methods applied by teachers during Distance Education are important to meet the needs of students and to be distinguished by pedagogical characteristics, especially when it comes to primary education. Communication with the teacher is of great importance and it is necessary for him/her to be familiar with new technologies in order to be present whenever the learner needs him/her.

EDUCATIONAL ROBOTICS AND DISTANCE EDUCATION

Educational Robotics has appeared in recent years in the field of education and many educators use it as a teaching tool, but many are not familiar with it and seek further training (Psalidou et al., 2021; Vicente et al., 2021; Shatunova et al., 2019). It is important to investigate information technologies and digital tools, that could be used in distance and blended learning contexts. Also, the enrichment of Distance Education, through the utilization of Educational Robotics, ICT and new innovated applications, is necessary, in order to meet the needs of the learners, especially the students of the first and second school level (Dudar et al., 2021; Shurygin et al., 2021; Drosatos, 2019).

Educational Robotics stands at the forefront of an educational revolution, offering a dynamic platform for students to engage with complex concepts through interactive and tangible experiences. Online students can engage in real-life experiences, experimenting with robots, programming, and problem-solving. Interactive learning at home becomes feasible, especially for homeschooled or online students. The advantages of Robotics extend to fostering creativity, critical thinking, and hands-on exploration. As AI and robotics become integral to various industries, students need exposure to these technologies. Distance education with robotics prepares them for the challenges of tomorrow's workforce. By embracing robotics, educators empower students to develop critical skills, nurture creativity, and tackle the complexities of the digital age (Sahlou et al., 2022; Zygouris & Mavroidis, 2011; Karvounis & Anastasiadis, 2019; Foti et al., 2024).

Students from remote regions gain access to educational resources that might otherwise be limited due to their location. By incorporating robotics into distance education, we ensure that all students, regardless of their physical location, can benefit from hands-on experiences with robots. Educational robots create a less intimidating learning environment. Students can explore concepts at their own pace, reducing performance pressure. Personalized learning paths can be tailored to individual student needs, allowing them to delve deeper into robotics concepts or revisit specific topics. Robots can also assist teachers by acting as co-learners or co-tutors. They encourage students to explain concepts, reinforcing their understanding. In remote settings, robots can serve as avatars, bridging the gap between students and educators. They facilitate communication and interaction, even when physical presence is not possible (Zygouris & Mavroidis, 2011; Karatrantou & Panagiotakopoulos, 2011; Karvounis & Anastasiadis, 2019; Gubenko et al., 2021).

Robotics serves as a practical tool for teaching Science, Technology, Engineering, and Mathematics (STEM) subjects. It brings abstract concepts to life, allowing students to witness the real-world application of what they have learned. By designing, building, and programming robots, students learn to tackle problems methodically, enhancing their analytical and critical thinking abilities as well as their problem-solving skills. Educational robotics encourages students to think outside the box and develop innovative solutions, which is essential for future careers in a rapidly evolving technological landscape. Distance educational robotics help students to further develop their creativity, innovation and they prepare them for the future workforce (Qazi, 2021; Dudar, 2021; Tzagkaraki et al., 2021; Vicente et al., 2021; Michalopoulos et al., 2022; Karemfillaki et al., 2022; Foti et al., 2023).

During the last decade Augmented Reality (AR) has emerged as a transformative tool in distance education, offering numerous benefits that enhance the learning experience. AR creates immersive learning scenarios that allow students to interact with 3D models and simulations, providing a deeper understanding of the subject matter. The interactivity of AR can increase students' engagement and motivation, leading to better learning outcomes. Moreover, despite physical distances, AR enables collaborative projects where students can work together in a virtual space, promoting teamwork and communication skills. AR, also, allows students to access complex equipment and environments that may not be available locally, breaking down barriers to advanced education (Pasalidou & Fachantidis, 2021; Pozzi et al., 2021). AR can overlay digital information onto the real world, allowing students to interact with 3D models and simulations, which enhances understanding and retention.

Establishing remote laboratories allows students to control and program robots in real-time, providing a hands-on experience from any location. Moreover, software simulations enable students to design and test robotics algorithms without the need for physical hardware, making robotics accessible to all. Online platforms can facilitate group projects where students design and build robots collaboratively, fostering teamwork and problem-solving skills. Furthermore, virtual robotics competitions can inspire students to apply their skills in a competitive and collaborative environment, enhancing their learning experience. Robotics can be used in various subjects, such as math and science, to demonstrate practical applications of theoretical knowledge (Silva et al., 2023; Andreou, 2021; López-Belmonte et al., 2021).

AIM AND RESEARCH QUESTIONS

The purpose of the study is to discuss the enrichment of Distance Education with ICT tools supporting Educational Robotics, in the frame of school education, in the context of complementary or/and blended education. The importance of the subject lies in the fact that it tries to highlight ways of utilizing Educational Robotics in both face-to-face and online educational activities. The research questions under discussion are:

1. What tools and in what ways can be used to support Educational Robotics in Distance School Education?
2. What could be the basic elements in the structure of an Educational Robotics based Lesson Plan?
3. What are basic recommendations for teachers willing to use Educational Robotics learning activities in Distance School Education?

METHODOLOGY

In the context of the research, a review was made of the Greek and international literature. The following journals and repositories: ResearchGate, Journal of Open and Distance Education and Educational Technology, Scopus, Google Scholar, Springer International Publishing and Education Sciences were searched. The keywords applied were Educational Robotics, distance education and Educational Robotics, tools for online educational robotics, simulators for Educational Robotics, Augmented Reality and ER, Virtual reality and ER, Remote Labs as well as combinations between them. A qualitative approach using a semi-conducted interview as the research tool was the second part for the applied research process, in order to collect and discuss experiences, opinions and behaviors of the participants and analyze data and interpreted in real study conditions. Ten persons participated in the study (5 male and 5 female). The interview-guide was consisted by seven (7) questions focused mostly on the tools that teachers use with Educational Robotics in their teaching and in what ways.

RESULTS

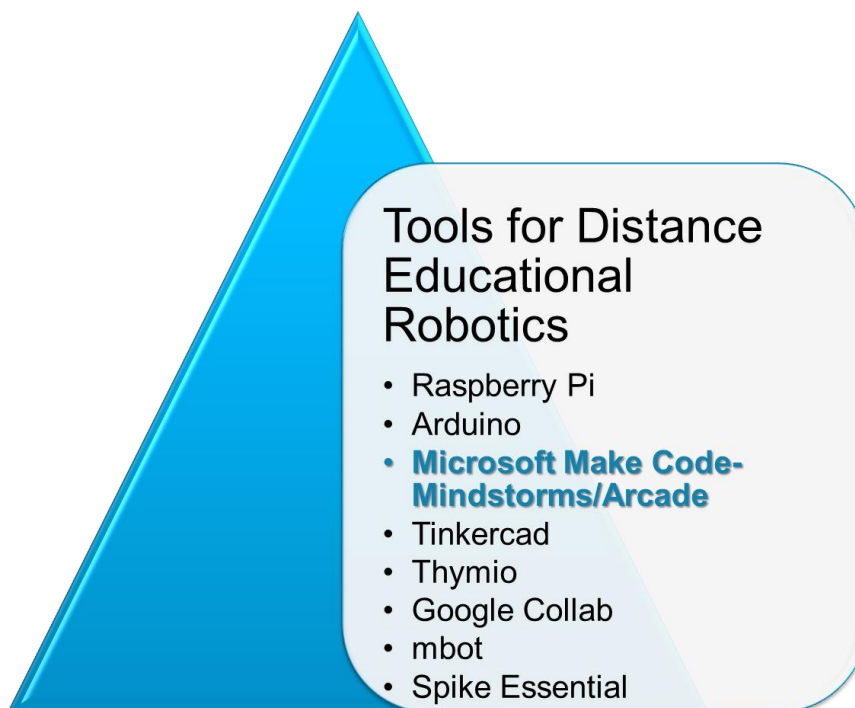
The results presented below arose from both the literature review and the interview based qualitative research approach.

The most popular and most used tools among teachers and students were mostly the tools Microsoft-Make Code from Lego Education, Lego Mindstorms, Lego Arcade, Micro:bit, Arduino, Raspberry pi. These tools can effectively be supported by platforms such as Zoom, Microsoft Teams, Webex, Moodle, e-me and e-class for distance learning purposes (figure 1) Furthermore, ICT tools can support educational robotics in distance school education through:

- virtual simulations
- educational videos
- AR and VR (CoSpaces Edu/ Arloopa)
- interactive environments (Google Collab)
- remote robotics platform (Lego Education, Vex Robotics)
- virtual learning environments (Robot Virtual Worlds)

The data analysis showed that most educators use tools that are flexible for remote application of Educational Robotics but also for teaching in the classroom. They also emphasized that it is important to choose tools that are appropriate for the age, access and needs of students. Teacher training in the used of educational Robotics is one of the most important factors when enriching Distance Education with Educational Robotics and ICT. Proper training is essential as the teacher must be familiar with the new technologies and new tools so that he/she can later support the learners. (Zygouris & Mavroidis, 2011; Karvounis & Anastasiadis, 2019; Sahlou et al., 2022; Foti et al, 2023; Foti et al, 2024).

Figure1 Tools and Platforms for supporting distance educational robotics



According to the data the teacher should be a moderator of knowledge and guide students properly. He/she should be involved in the teaching process, as a member of the team and work along with the

students. Teachers should, moreover assess the specific needs and abilities of their students and consider factors such as prior knowledge, technical proficiency, and access to technology.

Tools that foster student engagement such as, interactive simulations, gamified challenges, and collaborative projects can enhance motivation and participation. The activities that will be chosen should be well explained, short and encourage students to work as a team. Educational Robotics in combination with AR can make these activities more intriguing and enjoyable for students. For example, an augmented reality application can be used to simulate the operation of a robot and allow students to interact with it in a virtual environment. (Psalidou & Fachantidis, 2021). The combination of Educational Robotics and Augmented Reality during Distance Education, helps students to be confronted with pleasant activities, educational environments and games that lead them to acquire knowledge in a creative and authentic way (Silva et al., 2023; Andreou, 2021; López-Belmonte et al., 2021; Foti et al.,2023).

Tools that foster student engagement such as, interactive simulations, gamified challenges, and collaborative projects can enhance motivation and participation. The educational activities that will be chosen in a lesson plan should be well explained, short and encourage students to work as a team. Educational Robotics in combination with AR can make these activities more intriguing and enjoyable for students. For example, an augmented reality application can be used to simulate the operation of a robot and allow students to interact with it in a virtual environment. This can help students better understand the operation and functionality of the robot without requiring access to physical hardware (Psalidou & Fachantidis, 2021). Thus, with the combination of Educational Robotics and Augmented Reality during Distance Education, students are confronted with pleasant applications, educational environments and games that lead them to acquire knowledge in a creative and original way (Silva et al., 2023; Andreou, 2021; López-Belmonte et al., 2021; Foti et al.,2023).

INDICATIVE STRUCTURE OF AN EDUCATIONAL ROBOTICS BASED LESSON PLAN

Duration: At least 4 teaching hours

Note: *It is important that the lesson plan is adapted and organized based on the grade level, prior knowledge, and resources available to the students. Exercises can be modified to suit students' abilities and available time.*

Learning objectives are for students to:

- Become familiar with the basic principles and elements of robotics.
- Develop problem solving and critical thinking skills through hands-on activities with Microsoft Make Code (Lego Education).
- Collaborate effectively to complete educational robotics activities in a virtual environment.

Materials:

- Computer with installed the Zoom platform
- LEGO Mindstorms EV3/ Arcade <https://makecode.com/blog/lego/05-15-2018>
<https://www.microsoft.com/en-us/makecode> free online platforms.
- Internet connection
- Pen and paper for notes

The basic platform is Microsoft Make Code - Lego Education. It is recommended that the teacher make use of both alternatives of the platform mentioned and the robots from Lego Mindstorms EV3 i.e. *the possibilities of Make Code Arcade.*

Course structure:

Introducing students to the topic of educational robotics.

Explanation of the objectives of the lesson and what the teacher expects from the students.

Brief overview of Robotics

1. Leverage screen sharing in Zoom to present slides or a visual aid that introduces robotics.
2. Discuss fundamentals of robotics, including sensors, actuators, and programming.
3. Encourage students to share any prior knowledge or experiences they have with robotics.

Introducing LEGO Education

A brief tour by the teacher on the LEGO Mindstorms platform is suggested as an example <https://makecode.com/blog/lego/05-15-2018> <https://www.microsoft.com/en-us/makecode>

1. Introducing LEGO Mindstorms/ Arcade as a popular robotics platform.
2. View a short video or demonstration of LEGO Mindstorms or Lego Arcade robots in action.
3. Introducing the components of the LEGO Mindstorms/ Arcade set and their functions.

Learning objective 1: Familiarity with the principles of robotics

1. Present short slides, videos or images about the basics of robotics.
2. Discuss the importance of sensors, actuators and programming in robotics.
3. Engage students in short quizzes to resolve any questions about the concepts.

Indicatively, it is suggested that the teacher do a demonstration of how to program the robot on the Lego Mindstorms platform, i.e. show that the robot can move forward and backward. Then the students can proceed to prepare a corresponding exercise.

Learning Objective 2: Problem Solving and Critical Thinking

1. Students are asked to solve a simple robotics challenge using Microsoft Make Code- Lego Education. <https://makecode.com/blog/lego/05-15-2018> <https://www.microsoft.com/en-us/makecode>
2. Explanation of the activity and any restrictions or rules that apply.
3. Students in break out rooms work in teams, design and program a robot to complete the challenge.
4. Encouraging students to think critically and deal with any problems that arise.

Activity 1: Virtual maze

1. Share a screen with a virtual maze design using a whiteboard or simulation software.
2. Guide students to design and program a robot that can navigate the maze autonomously.
3. Students should document their design process and explain their programming logic.

Indicatively, it is suggested that the teacher do a demonstration using light sensors in an activity so that the students can see how they should work next. Activity 2 involves familiarization with a training robot.

Activity 2: Robot following the line

1. Explanation of the concept of line-following robots and their practical applications.
2. Students must build and program a robot that can follow a black line on a white surface.
3. Students should document their design process and programming techniques.

Completing the lesson

1. Recap of key concepts covered in the course.
2. Asking any questions the students have and giving comments and opinions about the lesson.
3. Encourage students to continue exploring robotics and share any projects or discoveries with the class

RECOMMENDATIONS TO TEACHERS

Teachers in distance educational robotics, play a central role in facilitating student learning. As constructivism is the basis for designing and implementing learning activities with educational Robotics, teachers are mentors, motivators, and facilitators of curiosity helping their students to be engaged more deeply into the learning process and prioritizes the student as a knowledge builder.

Encourage teachers to embrace this pivotal position and actively engage with students. They need to adapt their teaching methods to suit the unique needs of each student. They should recognize that every learner has different strengths, interests, and learning styles. They should also, personalize the educational experience by tailoring it to each individual student. The activities that will be used should be short, well explained and adapted to the needs of the students. Teachers should explain briefly the terms and the platforms that they will use during the lesson, because in this way students will know how to work using the platform and be able to focus on the learning activities. Having plenty of time, at least 4 hours per lesson planning is, also, important, as educational robotics require time flexibility.

One of the key points of this research is the central role of the teacher in effectively leveraging technologies for teaching and learning purposes. Educational robotics and supporting ICT tools for distance education, when utilized by qualified educators, can foster deeper engagement, critical thinking, and creativity among students. Teachers are essential in guiding students in the proper and effective use of these technologies, ensuring that they align with educational goals and facilitate meaningful learning experiences. In addition, the importance of choosing the right/suitable tools is of great importance. The success of educational robotics in distance education depends on the careful selection of appropriate hardware and software. It is important that these tools are selected based on the specific needs of the learners and the expected learning outcomes.

CONCLUSION

Distance education, when combined with educational robotics, opens up new opportunities for learning. It ensures inclusivity, practical experiences, and personalized learning paths, ultimately shaping a generation ready to thrive in a technology-driven world. Educational robotics provides a hands-on approach to learning complex STEM concepts, and combining with *virtual simulations, educational videos, AR and VR, interactive environments, remote robotics platforms, virtual learning environments*, can offer interactive experiences that transcends geographical limitations. They create a rich, engaging, and effective learning environment that prepares students for the challenges of the future.

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**THE INVESTIGATION OF THE EFFECTS OF 12-WEEK EQUIPMENT-BASED
PILATES EXERCISES ON SOME PHYSIOLOGICAL PARAMETERS AND
EMOTIONAL STATES OF WOMEN WORKING IN DIFFERENT OCCUPATIONAL
GROUPS**

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Abstract

In recent studies in the literature, which developed with the popularity of Pilates, the effects of the Pilates-based exercise method on various health-related outcomes have been. However, despite the increasing popularity of Pilates-based exercises and studies examining their effects on health, studies on the effects of Pilates exercises on working, healthy, adult female populations, especially in terms of psychological variables, are very limited. Accordingly, this study aimed to investigate the effects of 55 minutes of Pilates exercises two days a week for 12 weeks on some physiological parameters and mood states of working women. The participants in the sample group in this study are women who spend one-third of their day at their workplaces. Because women in professional life have high professional responsibilities and related stress and anxiety, as Pilates is a body-mind development exercise, women expect a quest that will relax both their bodies and minds. In this study, embedded design, one of the mixed method designs, was used. A total of 38 women between the ages of 30-45 years and career professionals participated in the study. The sample group was determined by appropriate and purposive sampling methods as an experimental group of 18 and a control group of 20. After the participants were divided into control and experimental groups, Tanita BF-350 measurement, meter measurement, V sit-stand test and Flamingo balance test were performed. Then, the PANAS Scale was applied to both groups at the beginning and end of the process. In addition, in the qualitative phase of this study, individual interviews were conducted with the experimental group at the end of the implementation process. As a result, a significant difference was found between the pre-test and post-test scores of physiological parameters such as weight, fat ratio, balance and flexibility of the experimental group. In the results obtained from the PANAS Scale, an increase was observed in the positive emotional states of the experimental group participants, while a decrease was found in their negative emotional states. Accordingly, it is seen that Pilates exercise for emotional state was effective in favour of the experimental group.

Keywords: pilates, women, emotional states, PANAS, physiological paramaters

**A RESEARCH ON STUDENT SATISFACTION IN E-LEARNING APPLICATIONS IN
TEACHING TURKISH AS A FOREIGN LANGUAGE**

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Abstract

This study aims to determine the satisfaction of Turkish as a Foreign Language students with e-learning applications, focusing specifically on Google Teams. E-learning applications play a crucial role in the learning process by supporting online learning and allowing students to participate in lessons from anywhere. In addition, e-learning applications eliminate the time limit in learning. E-learning applications have disadvantages as well as advantages, but today, due to some conditions (pandemic, natural disasters, time constraints, lifelong learning), using these applications has become an obligation rather than a choice. Therefore, this study aims to measure student satisfaction with Google Teams, determine its effectiveness, and obtain user feedback. The research question is: "How is the distribution of student satisfaction with e-learning applications among Turkish as a Foreign Language students?" The research universe was Istanbul Nisantasi University, and the sample consisted of 11 students at the B2 language level. The necessary permissions for scale usage, ethics committee approval, and consent forms were obtained. The study employed a mixed-methods approach. The quantitative aspect of the method was provided by a scale, while the qualitative aspect was provided by focus group interviews. The "Online Course Satisfaction Scale" developed by Bayrak (2020) was used to measure verbal comprehension attitude. The research findings indicate that students have a high level of satisfaction with the online learning environment. Students provided positive feedback in all areas, including teacher-student communication, access to educational materials, teachers' enthusiasm for online learning, presentation and clarity of course content, and usability of the online system.

Keywords: Teaching Turkish as a foreign language, e-learning, student satisfaction, online learning, Google Teams.

**FACTORS FOR INCREASING THE SHARE AND EFFICIENCY OF AZERBAIJAN
CANNING INDUSTRY PRODUCTS IN INTERNATIONAL MARKETS**

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Abstract

In the article, the canning industry market is analyzed, the countries that hold a dominant position in the market, and their share in the canning industry market are investigated. In order to investigate the factors of increasing the share and efficiency of the products of the canning industry of Azerbaijan in the international markets, the production capacity, competitiveness, export potential of the products of the local canning industry, the export indicators covering the years 2015-2022 by country, the main sales markets were analyzed, the shortcomings in this field were studied, evaluations were made as a result of the effects of the regulatory measures implemented in connection with these issues. The conditions and laws that are important for the entry of local canned products into the foreign market and their long-term dominance were analyzed, and the applicable standardizations were shown.

Keywords: canning industry, canned products, international market, export potential.

**EFFECT OF MICRONIZED PINE WOOD POWDER AND INORGANIC FILLERS ON
THE MECHANICAL PROPERTIES OF HYBRID POLYMER COMPOSITES**

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Abstract

Recently, efforts to recycle and reuse waste materials have been increasing rapidly. However, the use of recycled polymers is limited due to the decrease in their technical properties. Therefore, there is a need to improve the properties of recycled materials while simultaneously decreasing plastic usage. The aim of this study is to investigate the mechanical properties of hybrid composites obtained by adding calcium carbonate (CaCO_3) at different ratios by injection molding to recycled polypropylene (Re-PP), which already contains pine wood powder and talc obtained through plastic extrusion. Firstly, talc-containing Re-PP and pine powder were homogeneously mixed by twin screw extruder and granulated to produce the composites. In the second stage, CaCO_3 (10 - 15 wt. %) was added to the extruded composite and shaped by injection molding. The mechanical properties of the hybrid composites were investigated by tensile, flexure and impact tests. The findings revealed a linear increase in the tensile strength of the composites and a corresponding linear decrease in elongation at break with the addition of pine wood and CaCO_3 to Re-PP containing talc. As a result of flexural values, the flexural modulus value increased from 121.96 N/mm^2 to 1766.69 N/mm^2 with the addition of pine powder to Re-PP containing talc. This value continued to increase with the addition of CaCO_3 to the composite and increased to 1891.3 N/mm^2 and 1896.27 N/mm^2 , respectively. The flexural strength value of the composites increased from 30.56 N/mm^2 to 41.65 N/mm^2 with the addition of pine wood powder, while no change was observed with the addition of CaCO_3 . The impact test showed that the impact strength decreased from 13.18 kJ/mm to 5.90 kJ/mm with the addition of pine powder and CaCO_3 . The results showed that hybrid composites can be used as potential materials in automotive industry.

Keywords: Calcium Carbonate, Hybrid Composites, Pine Wood, Recycled Polypropylene, Talc, Sustainability

**EXAMINATION OF INTERVENTION PROGRAMS TO PREVENT SUBSTANCE
ADDICTION IN ADOLESCENTS**

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ABSTRACT

This review study was conducted to evaluate substance abuse in adolescents, intervention programs implemented to prevent substance abuse and to examine their importance in terms of public health nursing. The literature review was conducted in Google Scholar, PubMed, Academic Search Complete and Web of Sciences databases using the keywords 'Substance Addiction, Prevention, Intervention Program, Adolescent, Nursing'. English and Turkish articles published between 2015 and 2024 and whose full text was accessed were analysed. Substance addiction is considered as a priority public health problem due to the increasing prevalence of substance addiction in the world and in Turkey, especially among adolescents. Addiction is defined as the inability to control or stop using a behaviour or substance. Substance addiction is seen in the form of physiological symptoms and behavioural disorders. In line with the studies conducted, substance addiction, which causes physiological and behavioural disorders, causes differences in the perception of speed and space, resulting in distraction, abnormalities in speech and movements, and accidents resulting in death. Adolescents are in the most risky group in terms of the age of starting substance abuse. In a study, it was reported that individuals who use substances have decreased self-esteem and experience social exclusion. According to the results of another study, there was a relationship between substance abuse and problem-solving skills, suicide, depression and hopelessness. In another study, it was found that substance abusers had higher levels of anger. Considering the severe and irreversible interactive consequences of substance abuse at the individual, family and community levels, the establishment of preventive programs for adolescents who constitute the high-risk group gains importance in terms of solving the problem of substance abuse. Studies on the subject have reported that intervention programs may have a curative effect on the reduction and prevention of substance abuse. Studies on the subject have reported that intervention programs such as mobile phone-based education, school education, and parent education can be effective in reducing and preventing substance abuse. As public health nurses, it is recommended to implement effective intervention programs for early detection, protection and prevention of substance abuse by providing appropriate education and counselling to the individual and his/her parents in order for adolescents to create a healthy lifestyle by avoiding substance abuse.

Key words: Substance Abuse, Prevention, Intervention Program, Adolescent, Nursing.

INTRODUCTION

Due to the increasing prevalence of substance addiction, especially among adolescents, in the world and in Turkey, substance addiction is considered as a priority public health problem (Karakaş and Ersöğütçü 2016, Bulut and Yeşilkayalı 2020, Karataş 2020, Köktaş and Yiğitoğlu 2024). Dependence; It is defined as a person losing control over one or more substances, alcohol, objects or a behavior (action) he/she uses (Yeşilay Publications, 2018). Substance addiction is; It is defined as a treatable but regenerative brain disease that occurs as a result of a drug-like substance affecting the person's brain, causing a constant or periodic desire to take substances and various physiological and/or psychological symptoms in order to feel the pleasurable effects of the substance or to avoid the discomfort caused by its absence. (Karakaş and Ersöğütçü 2016, Uzbay 2018, Bulut and Yeşilkayalı 2020). Today, addictive substances include marijuana, synthetic cannabinoids (bonzai, marijuana, etc.), heroin, methamphetamine, cocaine, and ecstasy. While some of these substances have a stimulating effect, some have a narcotic effect and their use significantly threatens health (Tektaş and Kocataş 2020). Substance addiction manifests itself in the form of physiological symptoms and behavioral disorders. The difference in the individual's perception of speed and space as a result of substance use; It can cause accidents, impaired attention, movement and speech disorders, and even death (Shahid and Sumbul 2017, Alpay et al. 2018, Arabacı and Yurtsever 2021, Köktaş and Yiğitoğlu 2024). The problems experienced by an individual as a result of substance use affect not only the individual using the substance, but also his family living with him, his immediate environment, and the entire society with the losses and damages it causes (Bulut and Yeşilkayalı 2020, Köktaş and Yiğitoğlu 2024). The state of addiction progresses slowly throughout the process, and the addicted person is often unaware that he is addicted during this process (Bulut and Yeşilkayalı 2020). The individual realizes that he is addicted only when he experiences the negative effects of addiction (Tektaş Soy and Kocataş 2020, Köktaş and Yiğitoğlu 2024).

In Turkey, the age of first substance use among inpatients receiving treatment in 2020 was reported as 65.4% between the ages of 15-24 and 14% under the age of 15 (EGM 2022, Yılmaz et al. 2023). According to the United Nations World 2023 Drug Report, it was stated that 2.3 tons of cocaine were seized in Turkey in 2022 and this amount was 18% more than in 2021 (INCB 2023). According to the 2023 Turkey Drug Report, it is stated that the prevalence of substance use is 96% in men and 4% in women (Turkey Drug Report 2023). The rate of individuals in the adolescent age group who started using drugs was measured as 69.6% in 2022. Adolescents are in the highest risk group in terms of the age at which they start using drugs (Avcı et al. 2017, Yılmaz et al. 2023). In addition to the adolescent group, which is considered a risk factor for substance addiction, living in the city, living with friends or on the street, exposure to violence, fragmented family structure, peer influence, and a history of alcohol and substance use in the family are also stated as risk factors (Öztürk et al. 2015, Akbaş et al. Mutlu 2016, Yılmaz et al. 2023). The accessibility of the substance and the environment in which the person lives can increase the tendency towards substance use (Bah 2018, Sezen and Murat, 2018). Substance abuse; It causes many problems in the psychosocial dimension such as education, economy, social relations and stigma, emotional and psychiatric problems (Cüceler et al. 2022). In the study conducted by Tektaş and Kocataş (2020), it was reported that individuals who use substances have decreased self-esteem and experience social exclusion. According to the results of another study conducted by Fırıncık and Gürhan (2019), it was determined that there was a relationship between substance addiction and problem-solving skills, suicide, depression and hopelessness. As a result of another study conducted by Dilek and Tangül (2019), it was found that the anger level of people with substance use was higher.

As a result of the research, substance addiction negatively affects the life of the individual in many aspects; Prevention programs have gained importance all over the world because the treatment process for addicted people is a difficult and long process. In line with studies on the subject, it is reported that intervention programs can be effective in reducing and preventing substance addiction (Marsiglia et al. 2019, Tessson et al. 2020, Uyaroğlu and Özcan 2022). When the relevant literature is examined, it has been reported that the decrease in substance use as a result of the intervention studies is associated with better outcomes, including improvement in mental health (Haug et al 2021, Bergman et al 2019). This review study was conducted to evaluate substance addiction in adolescents, intervention

programs implemented to prevent substance addiction, and to examine their importance in terms of public health nursing.

METHODOLOGY

In this research, the literature review was conducted in Google Scholar, PubMed, Academic Search Complete and Web of Sciences databases using the keywords 'Substance Addiction, Prevention, Intervention Program, Adolescent, Nursing'. Articles in English and Turkish, published between 2015 and 2024 and whose full text was available, were examined.

RESULTS

The randomized controlled intervention study conducted by Bergman et al. (2019) was conducted to examine the effect of providing parents with information about their children's academic performance and behavior at school on reducing substance use rates in adolescents. For this study, conducted in Los Angeles, California, 318 seventh grade students and their parents were enrolled in 2014 and data was collected until 2016. Under this intervention program, called Information and Connecting Families Together, parents receive weekly text messages, phone calls, or emails about missed homework, grades, and behavior. While parents provided information about their monitoring and parenting self-efficacy, students reported their use of alcohol, marijuana, and other drugs and their intentions. As a result of the research, it is seen that self-efficacy, parent-child relationship and student grades are similar between groups. In addition, at the end of the eighth grade, lifetime alcohol or marijuana use was reported to be 18.2% in the control group and 10.2% in the intervention group. As a result, it was observed that the applied intervention program successfully reduced the rate of starting to use substances such as alcohol and marijuana in adolescents between the 7th and 8th grades.

Another intervention study by Marsiglia et al. (2019) was conducted to evaluate its effectiveness in preventing substance use for secondary school students in a large city in the USA. This research was conducted with a total of 532 participants in the 7th grade in 19 secondary schools. The study aimed to produce usable information about what works in preventing substance use in adolescents and how it works best (combined parent and youth programming or parent-only programming). Participants were randomly assigned to intervention groups: parent-youth (PY), parent only (PO), and comparison (C). It is noted that it focuses on comparison between parent and youth, parent only, to determine which intervention strategy works best to reduce substance use in adolescents, including alcohol, inhalant, cigarette, and marijuana use. When considering outcomes related to alcohol use, the parent-only intervention reported better results than the parent-youth intervention, and the parent-youth intervention outperformed the comparison group after 20 months. Additionally, it has been stated that the application of parental intervention alone shows a decreasing trend in substance use over time.

Another study by Teesson et al. (2020) was conducted multi-centered in Australia with 6386 participants aged 13-14 in 71 secondary schools. Participants were randomly assigned to four intervention groups: focusing on substance use only, focusing on anxiety and depression only, focusing on prevention of substance use-depression and anxiety, and active control group. The planned interventions were delivered online in school classrooms. A mixture of peer cartoon storyboards and classroom activities focusing on alcohol, marijuana, anxiety, and depression were used. Data were recorded at 12, 24, and 30 months after baseline. Compared to the control group, the combined intervention group was observed to have increased knowledge about alcohol and cannabis at 12, 24 and 30 months. Online prevention of substance use, depression and anxiety has been shown to reduce the likelihood of any drinking and occasional heavy drinking, as well as increase knowledge about substance use such as alcohol, cannabis and mental health, and reduce anxiety symptoms over a 30-month period. These findings demonstrate the effectiveness of an online universal school-based preventive intervention targeting substance use, depression, and anxiety in adolescence.

The study by Vigna et al. (2021) was conducted with 2685 participants with an average age of 14.2 in 32 secondary schools. Participants were randomly assigned to control and intervention groups. Participants were given intervention training consisting of a total of 12 units, each lasting 1 hour, by

their classroom teachers. Subjects such as correcting normative beliefs about substances and misperception about the prevalence of use among peers, critical and creative thinking, relationship skills, assertiveness, rejection skills, verbal and non-verbal communication, managing emotions, coping skills, empathy, problem solving are within the scope of intervention training. It is stated that information sessions on the consequences of tobacco, alcohol and drug use are also included in the program. When looking at the results of the research, it was reported that the prevalence of recent alcohol use decreased significantly in the intervention compared to the control students. It is stated that the effect on the prevalence of cigarette and marijuana use is not statistically significant.

Another intervention study by Haug et al. (2021) was conducted with 1473 participants with an average age of 15.4 from 89 secondary school and high school classes in Switzerland. The intervention program, which was implemented for 22 weeks, reportedly included personalized text messages and online feedback. It has been stated that the contents address the individual's self-management skills, social skills and resistance skills against substance use, based on social cognitive theory. It has been stated that this school-based intervention program is easy and economical. As a result of the 6-month follow-up evaluations, the first results regarding the effectiveness of the program indicate that the program can be effective in both preventing or reducing substance use and improving life skills.

In the study conducted by Uyaroglu and Özcan (2022), it was aimed to evaluate the effect of empowerment education in protecting adolescents from substance addiction. The research population consisted of 65 adolescents aged 12-14, including 33 experimental groups and 32 control groups. The empowerment training program, which lasted 45 minutes in total, consisted of 10 sessions. According to the results of the study, the difference between the self-efficacy, self-esteem and assertiveness scores between the experimental and control groups was found to be statistically significant. It has been reported that the empowerment training program increases adolescents' self-efficacy levels in protecting themselves from substance addiction, supports the development of self-esteem, and positively affects their assertiveness. As a result, empowerment from support activities to be carried out through psychosocial methods; It is stated that it will be one of the actions that will protect adolescents from substance addiction.

CONCLUSION

Considering the severe and irreversible interactive consequences of substance addiction at the individual, family and society levels, the creation of preventive programs for adolescents who constitute a high-risk group becomes important in terms of solving the substance addiction problem. Nurses; It has an important place within the treatment team in identifying risk groups, holistically evaluating individuals with substance use disorders, and ensuring continuity in care. In this regard, problems caused by substance use should be evaluated and these problems should be addressed first during the care process. Therapeutic group activities that will support individuals' socialization and increase their self-esteem should be organized and their participation should be encouraged. As a result, it is recommended that nurses should identify risky individuals and implement effective intervention programs for early detection, protection and prevention of substance addiction by providing appropriate education and counseling to the individual and their parents.

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**EXPLORING PHONETIC VARIATIONS IN DAILY TURKISH USE AMONG ARAB
STUDENTS IN TURKEY: IMPLICATIONS FOR LANGUAGE TEACHING
METHODOLOGY AND EDUCATION**

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Abstract

This study investigates the phonetic variations present in the daily usage of Turkish among Arab students studying in Turkey, with a focus on its implications for language teaching methodology and education. The research aims to shed light on the challenges faced by Arab learners of Turkish in mastering the language's phonetic intricacies and to propose strategies to address these challenges effectively.

Through qualitative analysis of linguistic data gathered from Arab students living in Turkey, this study identifies common phonetic variations in Turkish pronunciation among Arab learners. These variations often stem from differences in phonetic systems between Turkish and Arabic, as well as the influence of the students' native Arabic accents. The research also explores the socio-cultural factors that may contribute to these phonetic variations, such as language contact phenomena and the students' linguistic backgrounds.

The findings highlight the importance of recognizing and addressing phonetic variations in language teaching methodologies targeting Arab learners of Turkish. Traditional teaching approaches often overlook these variations, leading to ineffective language acquisition and communication barriers. Therefore, this study advocates for the integration of phonetic awareness and training into Turkish language curricula for Arab students. It suggests incorporating interactive exercises, audiovisual materials, and pronunciation drills tailored to address specific phonetic challenges faced by Arab learners.

Furthermore, the study underscores the need for cultural sensitivity and awareness in language education settings. By acknowledging the diverse linguistic backgrounds of students and creating inclusive learning environments, educators can foster a more supportive and effective language learning experience for Arab learners of Turkish.

In conclusion, this research contributes valuable insights into the phonetic variations present in the daily Turkish usage of Arab students in Turkey and offers practical recommendations for enhancing language teaching methodologies and education. By addressing these phonetic challenges systematically, educators can facilitate more successful language acquisition and cross-cultural communication among Arab learners of Turkish.

Keywords: Phonetic variations, Turkish, Arab students, language teaching methodology, education.

**OPTIMAL IDENTIFICATION APPROACH FOR FIXED-WING UNMANNED
AERIAL VEHICLE USING THE DIFFERENTIAL EVOLUTION ALGORITHM**

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Abstract

In the realm of fixed wing Unmanned Aerial Vehicles (UAVs), precise identification of nonlinear flight dynamics is of vital relevance for enhancing control and stability. Therefore, accurate identification is becoming more delicate and requires higher reliability, especially in nonlinear complex systems like UAVs. This study deals with the intelligent optimal identification system of lateral flying parameters in Aerosonde fixed-wing UAVs, leveraging new Evolutionary Computational approaches, named by Differential Evolution algorithm (DE). A sensitive analysis of the identification system for the complete array of lateral parameters is carried out, applying a predictive canonical second-order model. The reliability of the used technique is evaluated by analysing its ability to minimize the difference between the predicted model response and the actual response, considering additional input/output noise. A comparison is conducted with a statistical least squares technique, utilizing two unique excitation signals: pseudo-random binary sequences (PBRs) for accommodating variable frequencies throughout the identification phase and step position excitation for model validation. Detailed insights about convergence performance are also presented. Through extensive simulations, the results indicate that differential evolution outperforms classical approach, effectively enabling the acquisition of the whole suite of optimally identified lateral parameter models. This, in turn, enables a full understanding of lateral flight dynamics. Moreover, the findings demonstrate that the Differential Evolution approach exhibits consistent convergence, robustness, and resilience to high-frequency signal excitation.

Keywords: Fixed wing UAV, Differential Evolution Algorithm, Optimal identification,

**FRUSTRATION TOLERANCE OF ADOLESCENTS AND ITS CONNECTION
WITH CONSCIOUS AND UNCONSCIOUS REACTIONS**

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Abstract

Introduction/Aim. Adolescents were exposed to numerous frustrations in the family and wider social environment which they have to overcome themselves. The research was done with the aim of determining the degree of frustration tolerance of adolescents to failures in the family, school and with peers, and its connection with positive and negative conscious reactions and defense mechanisms, unconscious or less conscious reactions. The specific goal of the research was a proposal for preventive measures in mastering skills that increase frustration tolerance of adolescents.

Methods. The research was carried out on a sample of 91 adolescents, aged 15 – 18 years (n=102) . In the research was used to measure Questionnaire for determining the degree of frustration tolerance and the most common conscious reactions and defense mechanisms as a reaction to them. The data were processed by using descriptive statistics and linear regression analysis.

Results. The research results showed that the most common frustrations of adolescents at school was due to excessive obligations and school achievement, illnesses and bad relations between family members, school expectations and disregard for the needs of adolescents for respect in their families. In the relationship with peers, the most common frustration arises from incorrect behavior. The male adolescents had significantly ($p < 0.05$), higher frustration tolerance than girls ($M_m = 3.38$ vs. $M_f = 2.77$).

Linear regression analysis showed that the used of defense mechanisms were significantly ($p \leq 0.01$) correlated with highly developed frustration tolerance: sublimation ($\beta = -.048$), rationalization ($\beta = -.066$), negation ($\beta = .433$), suppression ($\beta = .461$). Positive conscious reactions to frustrating situations were significant ($p \leq 0.01$) predictors in developing frustration tolerance: change of approach in solving the problem ($\beta = -.873$, $p \leq 0.01$), conscious replacement of the goal ($\beta = -.873$, $p \leq 0.05$), and negative conscious reactions: aggression ($\beta = -.214$, $p \leq 0.05$), regression ($\beta = -.290$, $p \leq 0.05$), behavioral disorganization ($\beta = -.140$, $p \leq 0.05$),

Conclusion. The obtained data showed that conscious reactions to frustrations, positive and negative, as well as defense mechanisms were significantly related to frustration tolerance of adolescents. In strengthening adolescents' frustration tolerance, it is important to teach adolescents the skills of a proper objective approach to problems and awareness of the use defense mechanisms.

Key words: frustration tolerance of adolescents, positive and negative conscious reactions to frustrations, defense mechanisms

**THE INFLUENCE OF AGILITY IN SPORTS GAMES OF THE 10-14 YEARS OLD AGE
GROUP. (LITERATURE SUMMARY)**

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Abstract

This literature review explores the influence of age on the development of speed and agility components in male basketball and soccer players aged 10-14 years. It is known that children of the same chronological age show differences in biological growth. For better results, it is important for coaches and sports scientists to understand how age influences physical and physiological performance in these sports. The findings of our study show how players tend to experience improvements in muscle strength and speed with increasing age within the age range we considered. Methodology; The following methodology describes the steps followed to collect and analyse relevant studies and articles related to this topic: Identification of study sources: Academic databases such as PubMed, Google Scholar and Sport Discus were used to search for relevant articles in the last 10 years. Keywords and phrases included "age and sports performance," "speed and agility development," "youth basketball," "youth soccer," and various combinations thereof. Studies that included mainly female athletes or athletes outside the specified age range were excluded. Results: Data were collected and organized into thematic sections, including muscle strength, motor skills, body shape, injury risk, and training programs. Within each section, studies were grouped based on focus and key findings. Discussion and conclusion: A summary discussion was conducted to synthesize the information and draw connections between the various studies and their effects. Conclusions: Following this systematic methodology, this literature review aims to provide a broad and evidence-based assessment of how age affects the development of speed and agility skills in 10 - 14 year old male soccer and basketball players. The literature review will also provide insight into the role of recommended training programs and injury prevention strategies in optimizing the growth and athletic performance of young athletes. This literature review highlights the importance of age-appropriate training, passion for the sport, and health and safety considerations in the successful development of adolescent players in the sports of basketball and soccer.

Keywords: agility, basketball players, soccer players.

INTRODUCTION

Participation in sport is generally a positive experience for children and adolescents and should be encouraged. Early adolescence is characterized by rapid changes in physical growth and motor skills, as well as the emergence of special skills and talents. According to a study reported by (Jarani & Qeleshi, 2013), they show that children aged 11-14 from the city of Tirana in Albania

show low values in the development of physical activity. Participating in a variety of different activities is usually preferred by children, but depending on innate ability and talent, individuals may begin to specialize in their favorite sport in their teens. Changes can have a profound impact on their performance in sports, especially in terms of speed and agility, which are critical components of success in the sport of basketball and football according to the authors (Yapici et al., 2023, Pojskic et al., 2018, Slimani & Nikolaidis., 2018). During early childhood they develop fine motor skills that are small and precise movements said by (Bompa & Carrera, 2015). The age from 10 to 14 represents an important stage in the development of young athletes. This period, often called the "adolescent growth spurt," is characterized by rapid physical growth, hormonal changes, and maturation of body systems changes shown by the authors (Brown et al., 2017, Soliman et al., 2014). Speed allows athletes to cross the field quickly, hold back from opponents and seize scoring opportunities, according to the authors (Redwood-Brown et al., 2019). Meanwhile, agility enables athletes to change direction quickly, avoid opponents and maintain control over the ball, according to (Young et al., 2015). In team sports such as football and basketball, the ability to act quickly and be agile are useful for players who attack or defend. Unfortunately there is no universally accepted definition of resilience according to (Sheppard & Young, 2006). While earlier definitions referred exclusively to an element of change of direction, the authors point out (Brown & Ferrigno 2005, Semeninkc 1994), agility has recently been defined as "a rapid movement of the whole body with a change of speed or direction in response to a stimulus" according to (Sheppard & Young, 2006) and this definition has been adopted by several other authors (Jeffreys 2011, Young & Rogers, 2013). Change of direction has been described as the speed of "change of direction" say (Sheppard & Young, 2006), and this phrase has become increasingly common to distinguish this closed skill from dexterity that involves a reaction, according to the authors (Šalaj & Marković 2011, Brughelli et al., 2008). Coaches should program exercises on improving the qualities and skills of athletes and not only on physical performance or winning during competitions/matches. In order to achieve the most satisfactory results according to Bompa and Carrera (2015), it is important to consider some guidelines for coaches such as:

- The combination of a series of exercises that are related to the specificity of the sport they practice as well as other sports, increasing both the intensity and the volume of training.
- The use of a series of exercises that will help young athletes to perfect the basic skills learned so far and to develop complex skills that affect the improvement of concentration.
- Pay attention to training components of coordination, dexterity, speed, flexibility, and balance.

Age-appropriate speed-agility training recommendations are largely speculative due to the low amount of literature in this area (Jeffreys, 2019). Data from several different studies suggest that agility performance naturally improves with age (in addition to training), but especially from childhood to adolescence according to (Zemková & Hamar, 2014). Adaptation of training to improve speed & agility is not attributed only to the influences of exposed training stimuli but also to the natural processes of development of young athletes according to the authors (Harrison & McGuigan, 2019). It is difficult to distinguish between natural development and adaptations from exercise in young athletes, the author points out (Matos, 2007).

Synthesizing the findings from the studies conducted so far, we aim to shed light on the various factors that influence during this important stage of development. In the following sections we will also examine the impact of training programs tailored to this age group, as well as laboratory tests that can be developed to evaluate the efficacy of the components considered. Through this study we will aim to provide ideas that can inform coaches and sports scientists in their efforts to cultivate the physical and physiological development of young soccer and basketball players.

METHODS

This literature review on the influence of age on the agility component in male soccer and basketball players aged 10-14 years, a systematic search was used. The following methodology describes the steps followed to collect and analyses relevant studies and articles related to this topic: Identification of study sources: Academic databases such as PubMed, Google Scholar and Sport Discus were used to search for relevant articles in the last 10 years. Keywords and phrases included "age and sports performance," " agility development," "youth basketball," "youth soccer," and various combinations thereof. Studies that included mainly female athletes or athletes outside the specified age range were excluded. Studies published in peer-reviewed journals were given priority to ensure the quality of the sources. Articles focusing on male 10-14 year olds in the sports of soccer and basketball were retrieved. Also, articles studying the effect of age on speed and agility components, muscle strength, motor skills, body shape, injury risk, and effectiveness of training programs were included in this literature review. Studies that mainly involved football & basketball sports, female athletes or athletes outside the specified age range were excluded. Articles in languages other than English were excluded to facilitate a detailed analysis. Data analysis: Data were collected and organized into thematic sections, including agility, muscular strength, motor skills, body shape, injury risk, and training programs. Within each section, studies were grouped based on focus and key findings. Discussion and conclusion: A summary discussion was conducted to synthesize the information and draw connections between the various studies and their effects. Recommendations: Based on the findings of the literature review, recommendations were developed for coaches and sports scientists for building training protocols.

RESULTS

In total, 39 studies or scientific articles that fit the inclusion criteria in our study were reviewed. You will see the data of these 39 studies below in tables 1.

Table 1. Articles and results of the articles included in the study

Author and Year of publication	Review summary	Conclusion
Peñailillo et al. (2016)	Studied the influence of age on the development of muscle strength and speed in young soccer players. It revealed a significant increase in strength and speed with age.	Age-related improvements in strength and speed are evident in young soccer players and contribute to improved performance
Guimarães et al. (2021)	Studied changes in motor skills and coordination during adolescence in basketball players. Noticed significant improvements in motor skills in 10-12-14 year old players.	Adolescents in the 10-12-14 age group experience significant improvements in motor skills, which are important for basketball performance.
Trecroci et al. (2022)	Evidence of the impact of body shape changes on endurance and agility in young soccer players. It highlighted the increased impact on sustainability.	Changes in body composition during adolescence can affect endurance and require adaptations in training methods.
Mandorino et al. (2023)	It identified risk factors for injuries in teenage basketball and soccer players. Identified increased susceptibility to injury with development and age.	Appropriate injury prevention strategies, including strength training, are essential for the protection of young athletes.
Forster et al. (2022)	Analysed the effectiveness of age-appropriate training programs in improving speed and agility. It found that tailored training programs significantly improved performance in young athletes.	Age-appropriate training programs that consider individual needs and growth patterns are important for optimizing athletic development.
Warneke et al. (2023)	Studied the relationship between age and speed performance in young basketball players. Observed age-related improvements in fast sprint time.	Age-related improvements in quick sprint time abilities contribute to overall speed development in young basketball players.
França et al. (2022)	Explored the influence of age on agility and speed in male soccer players. It found age-related improvements in agility and speed.	Age-related improvements in agility and speed are advantageous for soccer performance.
Attar et al. (2022)	It highlighted the need for injury prevention programs tailored to this age group. Reexamined injury patterns in adolescent soccer players aged 10-12-14 years.	Injury prevention programs are important for reducing the risk of injury in young soccer players in the 10-12-14 age group.

Dahab & McCambridge (2009)	Investigated the effects of age on skill determination and decision making in young basketball players. Observed age-related improvements in decision-making ability.	Age-related improvements in decision-making skills are important for performance on the basketball court.
Pérez-Ifrán et al. (2022)	It revealed the relationship between age and the ability to change direction in young basketball players.	It was concluded that age-related improvements in the ability to change direction are necessary for basketball performance.
Chaalali et al. (2016)	Studied the influence of age on speed and agility performance in adolescent soccer players.	Emphasis was placed on the importance of age-related improvements in speed and agility for success in soccer.
Hughes et al.(2017)	Investigated the effects of age on endurance and coordination in male basketball players.	Emphasis was placed on the fact that age-related improvements in endurance and coordination contribute to overall athletic development.
Mandorino et al. (2023)	Studied injury data in adolescent soccer players aged 10-12-14 and analyzed injury patterns.	The need for age-appropriate injury prevention strategies for adolescent soccer players
Pocius & Malinauskas (2023)	Analyzed the relationship between age and acquired skills in young basketball players.	Skills acquired and improved with age have a positive impact on basketball performance.
Hicheur et al. (2017)	Studied the influence of age on decision-making skills in adolescent soccer players. Emphasis was placed on the importance of age-related improvements in decision making for soccer success.	Improvement in decision-making with increasing age in football players was evident.
Selmi et al. (2020)	Investigated the effects of age on sprinting capacity in male soccer players.	It found age-related improvements in sprinting capacity, contributing to soccer performance.
Yáñez-García et al. (2019)	Evaluated the effectiveness of age-matched strength training in adolescent basketball players.	Tailored strength training programs can improve strength and speed in young basketball players.
Zynda et al. (2022)	Studied injury data in adolescent basketball players aged 10-12-14 and identified common injury types.	Proposed age-appropriate injury prevention programs to reduce injury risk.
Scinicarelli et al. (2022)	Analyzed the relationship between age and speed in male soccer players.	Age-related improvements in speed are advantageous for soccer performance.

DISCUSSIONS

Table 1, to provide a detailed explanation of the results of studies about the influence of age on the development of speed and agility components in youth basketball and soccer players in the 10-14 age groups. They provide important information about the influence of age on the development of agility and performance skills in young basketball and soccer players. Let's make a comparison between the studies to identify some common trends and considerations in the results obtained on different components in the sports of basketball and football.

These comparisons show, in general, that age has a positive influence on the development of sports skills in young people. Improvements in strength, speed, motor skills, and endurance are important for performance in the sports of basketball and soccer. Sports coaches and staffs should use these studies to create age- and gender-tailored training programs that will help develop the potential of young players effectively.

This literature review highlights the importance of age-appropriate training, passion for the sport, and care for health and safety in the successful development of young players in the sports of basketball and soccer. Here are some key training components used in the selected literature:

Strength Training: Various body weight exercises help develop muscle strength.

Speed and Agility Drills: Drills with cones or cues to practice quick changes of direction, speed of movement and deceleration. Stepping exercises improve foot speed, coordination and balance.

Development of Special Sports Skills: In basketball, dribbling, passing, shooting and defensive skills are practiced. In soccer, you work on dribbling, passing, shooting and positional skills.

Interval Training: Interval dance exercises and small games are performed to improve endurance and anaerobic fitness.

Injury Prevention Programs: Develop a muscular warm-up routine with dynamic stretching. Includes exercises to strengthen specific muscle groups and joints that are prone to injury in these sports.

CONCLUSIONS

Current practical data on the effectiveness of training programs in these sports can be said to be still limited as a gap in scientific articles is evident. For this reason, more research and evidence are needed in Albania to better understand the various factors that influence the growth of the sports performance of these age groups in the sports of basketball and football spread throughout the region of Albania.

The age factor is important in sports training. Age, gender, training frequency, training experience, body mass, peripheral perception in boys were identified as main contributing factors in the search for agility and speed in young people, where these parameters undoubtedly have their potential in the field of exercise to increase performance during sports activity. Based on the reviewed literature on the influence of age on the development of agility components in basketball and soccer players aged 10-14 and considering the influence of maturation on performance, it is advised to use appropriate methods to assess and check the stage of maturation in young people.

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EMPOWERING INDIVIDUALS: A CATALYST FOR PERSONALIZED CAREER COUNSELING

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Abstract

The Talent Center model introduced in Slovenia aims to address the challenge of providing effective career guidance to approximately 20,000 primary school students annually. This model emphasizes personal growth and development, utilizing scientifically based testing systems for objective talent and ability assessments. A review of lifelong career counseling in Slovenia up to and after 1998 reveals a transition to more flexible paradigms, aided by technological advancements. However, there's still a need to better align education with labor market needs and ensure comprehensive career counseling. Comparative analysis with other countries underscores the importance of integrating career counseling into education from an early age. The Talent Center model offers numerous benefits for individuals, adults, schools, the academic community, companies, and the country as a whole, contributing to social and economic development. By offering accessible and personalized counseling, it empowers individuals to make informed decisions, enhancing Slovenia's workforce and competitiveness.

Keywords: Talent Center model, Lifelong career counselling, Positive impacts, Objective talent assessment, Informed career decisions, Overall development.

INTRODUCTION

In Slovenia, we will introduce the Talent ¹Center model, which will serve as a catalyst for career guidance and originates from the need to solve a key challenge: every year approximately 20,000 primary school students find themselves at a crucial turning point, i.e. choosing their further educational path and career path. Their decisions are mostly made without thorough scientific testing, and are often influenced by recommendations from parents or peers. By introducing the mentioned model, we want to create an inclusive, supportive platform that will focus on the personal growth and development of young people, promoting their unique abilities and interests. We want to be pioneers in the introduction of scientifically based, unique and revolutionary testing systems that will enable the objective assessment of talents and abilities of an individual.

¹The term "talent" is defined variously in professional literature within organizational psychology and human resource management (Vardi & Collings, 2023). In this article, we adopt a definition where talent is recognized in individuals, whether young people or employees, who possess knowledge, skills, abilities, and other qualities such as professional interests, which can be strategically applied for successful professional engagement. Therefore, talent can be understood as the potential an individual brings to a specific work environment. It's important to note that not everyone is talented for success in all work environments; finding the right match between one's attributes and the nature of the work is crucial.

In this paper, we will focus on the review of changes in lifelong career counseling in Slovenia up to and after 1998. We will also highlight the importance of lifelong career counseling. In the following, we will provide an assessment of lifelong career orientation in Slovenia compared to abroad. We will conclude with an analysis of the advantages of introducing the Talent Center model in the career development of an individual.

REVIEW OF CHANGES IN LIFELONG CAREER COUNSELING IN SLOVENIA UP TO AND AFTER 1998

Before 1998, lifelong career counseling in Slovenia followed a linear model, where individuals typically chose one profession and remained loyal to one employer. Limited access to career information hindered exploration of alternative paths (Cetin, 2008).

Since 1998, there has been a transition to more flexible career development paradigms. The internet and technological advancements have facilitated easier access to career information and the development of online career planning platforms. Career counseling now focuses more on individuality, emphasizing interests, values, and personal circumstances. Vocational counseling and career guidance programs have been established, aiding individuals in understanding their options and aligning education with labor market needs. This shift has also emphasized practical skills and employability (Cetin, 2008; Vuorinen, 2014).

Youth population in Slovenia from 1990 to 2100

From 1990 to 2020, the youth population (aged 15-29) in Slovenia decreased by as much as 31.1%. According to data from the Statistical Office of the Republic of Slovenia (SURS, 2020), in 2020, out of 310,694 young people, the lowest share was represented by the age group of 15-19 years (193,720 young people), followed by the groups of 20-24 years (103,089 young people) and 25-29 years (113,876 young people).

Despite a significant decline in previous decades, the number of young people in Slovenia stabilized in the in the period from 2017 to 2020. As can be seen from Table 1, stabilization of the youth population is also indicated in the future. A comparison of the proportion of young people in the entire population shows a similar trend. On the other hand, the marked increase in the number of elderly population continues, highlighting the importance of issues related to intergenerational relations (SURS, 2020).

Future forecasts also indicate that the age dependency index of the population in the European Union will continue to increase. Particularly in Slovenia, the greatest changes are expected in the period 2020-2060. These demographic trends are accompanied by significant social changes, especially in the areas of work and employment, the pension system, healthcare and social welfare for the elderly population, and intergenerational relations (SURS, 2020).

THE IMPORTANCE OF LIFELONG CAREER COUNSELING

Education and career decisions profoundly impact young people, with factors like gender, ethnicity, and socio-economic status strongly influencing them. Career counseling not only benefits individuals but also serves the broader social good by aiding learning, enhancing labor market efficiency, and advancing social policy goals like mobility and equal treatment. Thus, public investment in career guidance is justified. Empirical evidence underscores its role in enhancing young people's knowledge, understanding, and outcomes across education, social, and economic domains. Given the complexity of the labor market and the lengthy education and training periods, the demand for career counseling is on the rise (Musset, 2018).

In primary and secondary schools, lifelong career counseling is pivotal for holistic individual development, assisting students in identifying their interests, talents, values, and suitable career paths.

The transition of graduates into employment is influenced by market conditions, personal attributes, and higher education institutions' efforts to ease this transition. These efforts include career counseling, integrating practical skills into curricula, collaborating with companies, offering work experience, tailoring programs to employer needs, and fostering entrepreneurial skills. Recognizing these needs, Slovenia conducted public tenders co-financed by the European Social Fund. Two tenders from 2010-2015 aimed to develop career orientation activities in higher education, benefiting both public universities and private institutions (MK Projekt, 2015).

Aligned with the Resolution on the National Higher Education Program 2030, Slovenia sought to inclusively represent social groups in higher education. Post-tender, the Ministry of Higher Education, Science, and Innovation focused career centers on supporting students, especially those facing unique challenges. A 2022 tender further strengthened career centers' role in supporting special student groups, including those with special needs, mental health concerns, experiences of violence, caring responsibilities, or other personal circumstances, along with gifted and non-traditional students.

ASSESSMENT OF LIFELONG CAREER ORIENTATION IN SLOVENIA COMPARED TO ABROAD

Denmark emphasizes lifelong learning and career adaptation to labor market needs, with numerous career centers offering counseling services. Career guidance starts early in education, with compulsory education on education, career, and the labor market from grades 1 to 9, supported by dedicated career counselors in every primary school (Cetin, 2008; Andreassen, Einarsdóttir, Lerkkanen et al. 2019).

Austria also prioritizes lifelong career development, offering various forms of support, including apprenticeship programs and further education opportunities. Career guidance is integrated into the education system, with compulsory career education in seventh and eighth grades, although delivered by teachers who may lack experience in this field (Cetin, 2008; Drobnič, 2020).

Spain mandates career counseling during both youth and adult education, with counselors offering support in primary, secondary, and further education settings. Public employment agencies also provide counseling, with counselors typically holding degrees in psychology, law, or sociology (Cetin, 2008; Drobnič, 2020; Eurydice, 2024).

In the UK, careers education became compulsory for 14-16 year olds in 1997, and the government recently lowered the age to 11, emphasizing the importance of career education. Schools employ personal counselors, some specializing in career counseling, while external providers also offer services. Employment agencies train their staff for career counseling roles (Cetin, 2008; Drobnič, 2020; Department for Education, 2023).

In the USA, elementary school career counseling varies by state and school, often focusing on basic career exploration concepts. While not mandatory nationwide, many schools offer career exploration activities to encourage students to consider their interests and goals (U.S. Department of Education, 2024).

In Slovenia, lifelong learning and career development are promoted, with career centers providing support for career planning. However, career counseling is not mandatory at any educational level, except for registered unemployed individuals through informational seminars and trainings (SURS, 2020).

Each country faces unique challenges and opportunities in lifelong career guidance, emphasizing the importance of regular evaluations and adjustments to ensure effective support for individuals in career planning and development.

ANALYSIS OF THE ADVANTAGES OF INTRODUCING THE TALENT CENTER MODEL IN THE CAREER DEVELOPMENT OF AN INDIVIDUAL

We're tackling a complex challenge: creating an environment where young people can discover and pursue their talents and passions while ensuring these align with their educational and professional paths. Additionally, we aim to foster a society that values diverse talents and uses them effectively to advance our community and economy. The Talent Center model offers inclusive support, providing comprehensive career guidance tailored to individual knowledge, skills, and abilities. It includes scientifically-based testing systems to aid decision-making about further education.

Talent Center Slovenia will be a creative space for young people to explore their futures, addressing key questions such as:

- "What interests me?" Using scientifically-supported tests and research.
- "Where do I see myself?" Through orientation to clarify future options.
- "What are my strengths?" Identifying and nurturing unique talents.
- "What are my weaknesses?" Providing objective feedback for improvement.
- "Which path should I take?" Helping determine suitability for higher or vocational education based on interests, talents, and abilities.
-

The concept of testing

With the help of the orientation platform, young people will be supported in schools and training programs, with the aim that nothing hinders the optimal start of their career.

Table 1. Concept of testing. Source: own (2024).

Motor skills		Cognitive abilities		Specific professional skills and other qualities	
✓	manual dexterity	✓	logical thinking with numbers	✓	practical mathematics
✓	receptivity	✓	retention	✓	language competence in the mother tongue
✓	hand-eye coordination	✓	logical thinking with shapes	✓	linguistic competence in a foreign language
✓	responsiveness	✓	basic math skills	✓	physical and technical understanding
✓	fine motor skills	✓	fluidity	✓	organizational talent
		✓	2D spatial sharpness		

Testing process

The testing process at Talent Center Slovenia encompasses the following areas:

- **Development and Upgradation:** Career guidance methods at Talent Center Slovenia were initially developed through a research project at the University of Graz and will be further refined through ongoing research at the University of Maribor. Testing stations equipped with modern technology will assess professional skills, interests, cognitive abilities, and motor skills.

- **Application Process:** Participation in testing occurs in two steps. First, teachers register 8th or 9th-grade students for an event at Talent Center Slovenia. Second, students undergo talent screening and testing, lasting approximately four and a half hours. The following day, students can access their personalized talent report online.
- **Accompaniment and Assessment:** Employees of Talent Center Slovenia guide students through the testing process and provide assessments of cognitive abilities, motor skills, and relevant professional knowledge. Each participant receives a certificate and report, accessible via a web portal.
- **Education and Training Focus:** Talent Center Slovenia serves as an orientation platform for young people, assisting them in selecting training programs aligned with their goals and interests.
- **Results Reporting:** Participants can obtain their individual talent report online, which includes feedback on personal interests, motor skills, cognitive abilities, and suggestions for suitable professions. The report aims to facilitate career guidance and provide insights for future training and career opportunities.
- **Impact:** The post-test report aids students in understanding their talents and interests, guiding them towards suitable career paths and facilitating vocational training decisions.

Target groups

Young people: Talent Center Slovenia will cater to a significant target audience comprising approximately 20,000 young individuals who embark on their career paths annually. This substantial group presents a prime opportunity to provide guidance and support to young people as they make critical career decisions. Trends suggest that the number of youth opting to pursue further education and select career paths will remain stable over the next decade. This underscores the enduring necessity for our services, as successive generations will encounter similar challenges in choosing their professions (SURS, 2020).

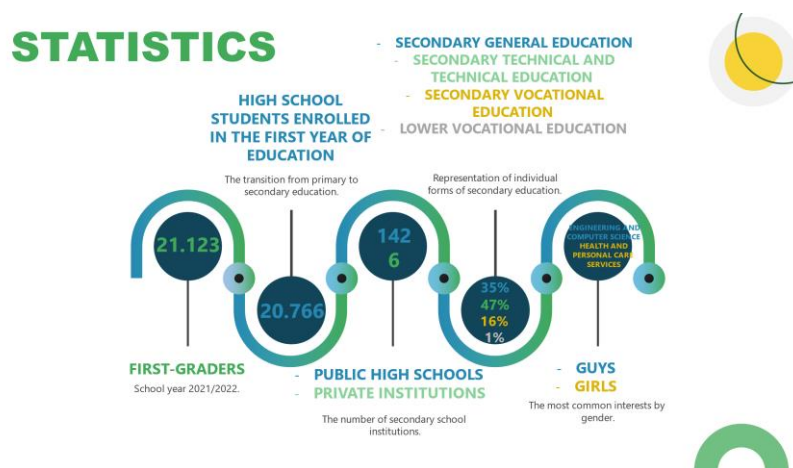


Figure 1. Statistics valid for 2021/2022. Source: own (2024).

Adults: In 2022, 43% of individuals aged 18-69 were engaged in formal and/or informal education, a decrease of 4 percentage points from the 2016 survey. Women exhibited greater involvement (47%) compared to men in the same age bracket (40%) (SURS, 2023). A preliminary analysis in 2022 involved 485 teaching staff members, comprising 96 from primary schools, 31 from secondary schools, 350 from universities (UM, UL, UP), and 8 from private institutions (Gea College and Alma Mater Europaea) (Cajnko et al., 2022).

When presented with the statement, "I am ready to introduce a novelty, a new method into my teaching process, the result of which would be that I would gain a healthy/strong authority, and the listeners would be more motivated and would successfully complete more activities," 414

respondents (86% of all) expressed readiness to introduce innovations in teaching. Only 1% (3 respondents) were hesitant, while 13% (64 respondents) were unsure. The high interest in cooperation and adopting new methods indicates a readiness for change in educational practices (Cajnko et al., 2022).

Regarding further self-improvement or education to achieve the aforementioned goals, 415 respondents (86%) expressed readiness, while 1% (5 respondents) were not prepared for additional studies. 3% (64 respondents) were uncertain. This overwhelming interest in further education suggests strong support for the proposed model's introduction (Cajnko et al., 2022).

Lastly, when asked if they dared to realize innovative ideas, 475 respondents (98%) expressed willingness, while 2% (10 respondents) were hesitant. These responses affirm the importance of innovative approaches and signal support for ongoing projects (Cajnko et al., 2022).

In conclusion, the majority of respondents demonstrate a willingness to embrace change, pursue further education, and implement innovative ideas. These findings underscore the importance of continuous development and adaptation, supporting lifelong learning initiatives to remain competitive and flexible in the evolving labor market.

Schools: Data shows a slight decline in the rate of young people leaving the formal education system. While 49% of young people were enrolled in higher education in 2014, this figure decreased to 45% by 2018. Despite this, Slovenia maintains the highest rate of tertiary education enrollment in the EU, well above the average of all member states at 32%. This high enrollment rate bodes well for Slovenia's future development, especially considering the increasing internationalization of higher education. Talent Center Slovenia will serve as a crucial source of information for schools, enabling them to tailor their programs to promote the development of students' talents and interests, thereby enhancing the overall educational experience.

Academic Community: Research data collected through the platform will allow for monitoring the development of young people, their educational and career paths, through longitudinal research. Researchers from various fields can be involved in this process, contributing to upgrades and supplements of testing.

Companies: Talent Center Slovenia will provide valuable information for companies seeking to acquire and retain talented workers. By analyzing our data, companies can better understand which areas and skills are most important to young market entrants, enabling them to adjust their recruitment, development, and training strategies accordingly. Additionally, our services will help companies attract and retain the best talent, crucial for their long-term success.

Country: The establishment of Talent Center Slovenia is crucial for the country, as human resources are essential for social development. Investing in properly oriented personnel is a key priority. Additionally, public administration faces a personnel deficit, with many employees whose skills could be better utilized elsewhere. Talent Center Slovenia offers a solution by directing existing staff to more suitable positions, benefiting both employees and the country as a whole.

CONCLUSION

The introduction of the Talent Center model in Slovenia marks a significant advancement in addressing the challenge of providing effective career guidance to approximately 20,000 primary school students annually. This model aims to create an inclusive platform focused on personal growth, utilizing scientifically based testing systems for objective talent and ability assessments.

The review of lifelong career counseling in Slovenia up to and after 1998 reveals a transition from linear career models to more flexible paradigms, aided by technological advancements. While

improvements have been made, there is still a need to better align education with labor market needs and ensure comprehensive career counseling.

Comparative analysis with other countries underscores the importance of integrating career counseling into education from an early age, as seen in Denmark and Austria. While Slovenia emphasizes lifelong learning, there's a need to strengthen mandatory career counseling across all educational levels.

The Talent Center model offers numerous benefits for individuals, facilitating effective exploration of interests, talents, and career options. It also supports adults adapting to workplace trends and helps companies attract and retain talented workers.

In conclusion, the establishment of Talent Center Slovenia represents a proactive step in addressing career guidance challenges. By offering accessible and personalized counseling, it empowers individuals to make informed decisions, contributing to Slovenia's social and economic development.

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**INVESTIGATION OF TANKS IN THE TURKISH ARMED FORCES INVENTORY
USING MULTI-CRITERIA DECISION-MAKING METHODS IN THE CONTEXT
OF SUITABILITY FOR MODERNIZATION**

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ABSTRACT

One of the biggest technological breakthroughs in the course of war in World War I was the invention of the tank, a walking combination of armor and firepower. The tank, which emerged as a support for the infantry class, would become a class and weapon in itself in the coming years. Tank units, used correctly and appropriately, still appear as a great force multiplier for armies. Tanks and anti-tank guns have been in a constant race throughout history, and armor and armor-piercing devices are trying to defeat each other even today. Although warfare has ceased to be conventional and has become asymmetrical, making us question the necessity of the tank, the tank definitely maintains its importance in today's conditions.

Tank maneuverability can be examined within the framework of the appropriate combination of firepower and survivability, and can also be equipped in this context according to the purpose and type of operation. Main equipment and weapon systems of the Tank class in the Turkish Armed Forces inventory; They are M48 A5 T1/T2 series tanks, M60 A1/A3 and T series tanks and Leopard 1A3T1/ 1T/2A4 tanks. Production and development studies of the domestic ALTAY tank are still continuing. Altay modern tanks are equipped with the latest technologies and stand out with their superior firepower, accuracy, high mobility and survivability.

Today, as the understanding of warfare has changed, the need to make tanks compatible with modern warfare techniques, agile and durable is no longer a choice but an obligation. The diversification and proliferation of armor-piercing and anti-tank guns has led to the need to increase armoring. The increase in armoring has brought with it an increase in weight, which has made today's tanks over 60 tons and limited their maneuverability.

The aim of this study is to examine the tanks in the Turkish Armed Forces inventory with multi-criteria decision-making methods in terms of their suitability for modernization from the

perspective of today's warfare understanding, to comment on the currently ongoing modernization activities, and to take a look at the necessity of the tank's existence today.

Keywords: Turkish Armed Forces, Land Forces, Tank, Modernization, Decision Making, Prioritization, Multi-Criteria.

INTRODUCTION

The pace of change of current events in defense, our obligation to keep up with innovation and the conditions to remain dynamic pose a major decision-making problem in this field as well.

The capabilities we currently have, those that can be developed, those that we have to develop, etc. Problems force us to make a decision. The methodology we will apply in this direction is to determine the decision-making criteria we will compare, which for armored vehicles can be selected in general terms as firepower, maneuverability, survivability and maintainability-easiness of supply.

The study will be carried out by briefly explaining the general features of our tanks, determining our criteria and weights, and applying the decision-making methodology.

In this study, it is aimed to develop a decision-making methodology by weighting the current capabilities of the tanks in our inventory with each other using DEMATEL, one of the Multi-Criteria Decision Making Methods, comparing them with the TOPSIS method, and finding the most appropriate group to increase their current capabilities and field.

A statement can be made for multi-criteria decision-making methods as 'they consist of algorithms developed to enable people to make the most useful decisions'. Different algorithms can be used to choose among multiple alternatives in the light of the available information. While classical multi-criteria decision-making methods are used if the available information is complete and clear, fuzzy multi-criteria decision-making methods have been developed to make choices with incomplete and unclear information. Multi-criteria decision-making problems can be defined as problems in which the best alternative is selected among possible solution sets in which more than one criterion is optimized. To reach the best solution in a multi-criteria decision-making problem, different multi-criteria decision-making methods can be used. One of the problems that the decision maker may encounter when starting a solution is determining which method is the appropriate method. When determining the most appropriate method, the decision maker should look at the nature of the problem and the characteristics of the process.

Multi-criteria decision-making problems are divided into three groups: selection, classification and ranking problems. As a result of the techniques used for selection problems, it is decided which is the most beneficial among many alternatives. While classification techniques group alternatives, ranking techniques rank among alternatives.

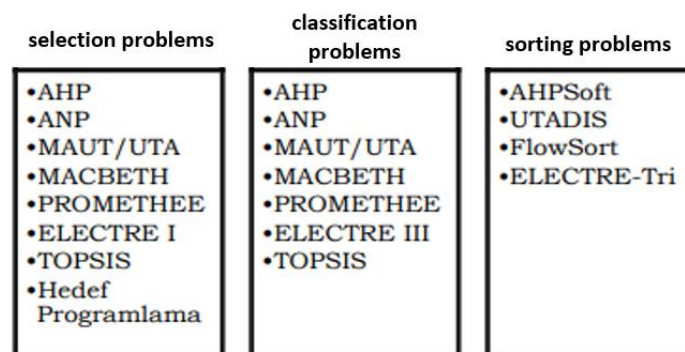


Figure 1: Multi-Criteria Decision Making Problems and Techniques

MATERIALS AND METHODS

Main equipment and weapon systems of the Tank class in the Turkish Armed Forces inventory; They are M48 A5 T1/T2 series tanks, M60 A1/A3 and T series tanks and Leopard 1A3T1/ 1T/2A4 tanks. Production and development studies of the domestic ALTAY tank are still continuing. Altay modern tanks are equipped with the latest technologies and stand out with their superior firepower, accuracy, high mobility and survivability.

M48A5T2



Figure2: M48A5T2

It is among the tanks taken into the inventory due to the need for new tanks, which manifested itself as the tanks purchased from the USA during the Cold War period became obsolete. M48 tanks, which started to enter the inventory in 1968, were used effectively together with M47 tanks, especially during the Cyprus Operation. As the need for modernization was felt after the operation, the M48 tanks we had were upgraded to the M48A5T2 level with the US and German modernizations, and there are approximately 750 units in the inventory.

Table:1 M48A5T2 Tank Specifications

Origin	USA
Crew	4
Engine	Continental AVDS 1770-5a 810 HP
Speed	48 km/h
Range	~490 km
Weight	48.5 ton
Weapon	105mm rifled, 12.7mm, 7.62mm machine gun

LEOPARD 1



Figure3: LEOPARD 1

The first Leopard 1 tanks began to enter our army in 1982 with German military assistance. A total of 171 Leopard 1 models, including 1A3T1, 1A1A4 and 1A1, were modernized with Volkan firing systems and upgraded to the Leopard 1T version. Considered a very good design for its period, the Leopard 1 tank is also known for its weak armor compared to its competitors. Today, there are ~171 Leopard 1T tanks in the Turkish Armed Forces.

Table:2 LEOPARD 1 Tank Features

Origin	Germany
Crew	4
Engine	MTU MB 838 CA M500 diesel 830 HP
Speed	65 km/h
Range	600 km
Weight	42.2 ton
Weapon	105mm Royal Ordnance L7 rifled

M60A3



Figure4: M60A3

While withdrawing from the region after the Gulf War, the USA donated the M60 tanks it had to its allies in the region. One of the countries that received a share from these tanks was Türkiye. With this grant, 104 M60A1 and 872 M60A3 tanks entered the Turkish Armed Forces. M60 tanks, which will undergo M60T modernization, are still in active use. There are ~645 units in inventory.

Table:3 M60A3 Tank Specifications

Origin	USA
Crew	4
Engine	Continental AVDS 1770-2c diesel 750 HP
Speed	48 km/h
Range	480 km
Weight	52 ton
Weapon	105mm rifled, 12.7mm, 7.62mm machine gun

LEOPARD 2A4



Figure5: LEOPARD 2A4

It entered the inventory in 2006 to meet the army's need for modern tanks. We also know that an existing modernization work is being carried out. There are ~334 units in inventory.

Table:4 LEOPARD 2A4 Tank Features

Origin	Germany
Crew	4
Engine	MTU MB 873 Ka 501 1500 HP
Speed	72 km/h
Range	550 km
Weight	55.15 Ton
Weapon	Rheinmetall 120mm L44 smoothbore

M60T



Figure6: M60T

It is the modernized version of the M60 tanks given by the USA with a grant after the Gulf War, by IMI (Israel Military Industries). This model, developed as a result of the need to modernize the M60 tanks we have, was produced in line with Turkey's own wishes and needs. M60T tanks are our most modern tanks currently in the inventory, and have demonstrated their success in the asymmetric warfare field in the operations they have experienced. There are ~166 units in inventory.

Table:5 M60T Tank Specifications

Origin	Manufactured at ABD, Modernised in İsrail
Crew	4
Engine	MTU 881 Ka-501 diesel 1000 HP
Speed	48 km/h
Range	450 km
Weight	55 ton
Weapon	120mm MG253 smoothbore, 12.7mm

DEMATEL

Criteria Weighting

The Decision Making Trial and Evaluation Laboratory (DEMATEL) Method; It was developed by the Geneva Battelle Memorial Institute, Science and Human Relations program between 1972 and 1976, in order to be used in solving complex and intertwined problem groups in research. DEMATEL was developed with the hope of pioneering the use of appropriate scientific research methods to improve the understanding of specific problematics, contributing to the identification of interlocking sets of problems and feasible solutions in a hierarchical structure. The graph theory-based DEMATEL method allows us to plan and solve problems as a draft by dividing the relevant factors into cause and effect groups, which will enable us to better understand the causal relationship. The main advantage of the DEMATEL method is that it covers indirect relationships involving a consensual cause-effect model. DEMATEL method is an effective method that examines the structure and relationships between system components or a valid number of alternatives. DEMATEL can arrange the criteria in order of priority in terms of the type of relationships and the importance of their effects on each other. Criteria that have a greater impact on other criteria and are assumed to have a higher priority are called cause criteria, and criteria that are more influenced and assumed to have a low priority are called result criteria.

TANKS SELECTION ALGORITHM WITH DEMATEL

STEP 1: Identifying Candidates

Our tanks currently in the inventory are M48 A5 T1/T2 series tanks, M60 A1/A3 and T series tanks and Leopard 1A3T1/ 1T/2A4 tanks. Our domestic ALTAY tank is in the transition phase to mass production.

STEP 2: Determining the Criteria

The four most important criteria affecting the selection of tanks to be modernized for the Turkish Armed Forces have been determined. Since they are seen as defense industry projects that are essential to be realized, the needs of the operation, cost and project duration are not considered as criteria.

The determined criteria;

- Maneuverability- Evaluated based on SPEED and ENGINE POWER.
- Maneuverability- Evaluated based on WEIGHT.
- Firepower- Evaluated based on tank gun diameter and range.
- Survivability- Evaluated based on armoring status.

In this research, criterion weighting was done with the DEMATEL method..

Table:6 Determination of DEMATEL Method Criteria

	Criteria
K1	Maneuverability- Evaluated based on SPEED and ENGINE POWER.
K2	Maneuverability- Evaluated based on WEIGHT.
K3	Firepower- Evaluated based on tank gun diameter and range.
K4	Survivability- Evaluated based on armoring status.

STEP 3: Weighting of Criteria (Determining Direct Relationship Matrix)

Table:7 Direct Relationship Matrix

CRITERIA	K1 (speed and engine power)	K2 (weight- maneuverability)	K3(fire power)	K4(Survivability)
K1 (speed and engine power)	0	0	0,666667	3,333333
K2 (weight- maneuverability)	3,666667	0	0	3,666667
K3(fire power)	1,333333	2	0	4
K4(Survivability)	3,333333	3,666667	0,333333	0

Step 4: Determining the Relationships of the Criteria (Determining the Normalized Relationship Matrix)

$$D = A \times S$$

$$S = \min\left(\frac{1}{\max \sum_{j=1}^n a_{ij}}, \frac{1}{\max \sum_{i=1}^n a_{ij}}\right) \quad (1)$$

To find the S value, we find the sum of the values in each row and column. The largest value of all these sums is our S value, in which case our S value is 11. We divide our criterion values by the S value to find the normalized relationship matrix.

Table:8 Normalized Direct Relationship Matrix

D	K1 (speed and engine power)	K2 (weight- maneuverability)	K3(fire power)	K4(Survivability)
K1 (speed and engine power)	0	0	0,060606	0,30303
K2 (weight- maneuverability)	0,333333	0	0	0,333333
K3(fire power)	0,121212	0,181818	0	0,363636
K4(Survivability)	0,30303	0,333333	0,030303	0

Step 5: Determining the Total Relationship Matrix

After finding the direct-relationship matrix, total relationship matrices were obtained..

$$T = D(I - D)^{-1} \quad (2)$$

Table:9 Total Relationship Matrix

T	K1 (speed and engine power)	K2 (weight-maneuverability)	K3(fire power)	K4(Survivability)
K1 (speed and engine power)	0,202644	0,166174	0,086563	0,451306
K2 (weight-maneuverability)	0,592918	0,210857	0,054207	0,603003
K3(fire power)	0,463072	0,409897	0,048006	0,65805
K4(Survivability)	0,576109	0,466396	0,076058	0,357701

Step 6: Calculation of Prominence and Relation Values for Each Criterion

Prominence and Relation Values are calculated for each criterion. R and C values are calculated by applying equations to the T matrix. R+C is Prominence and R-C is Relation value. R values are equal to the sum of each row in matrix T, and C values are equal to the sum of each column in matrix T.

$$R_i = \sum_{j=1}^n t_{ij}$$

$$C_j = \sum_{i=1}^n t_{ij} \quad (3)$$

Table:10 Prominence and Relation Values

R	C	R+C	R-C
0,90668772	7,08328	7,989967	-6,17659
1,460984057	7,709485	9,170469	-6,2485
1,579025111	6,571848	8,150873	-4,99282
1,476264453	6,532366	8,008631	-5,0561

Step 7: Creating the Threshold Value and Cause-Effect Diagram

Threshold Value (TS) is the average of all values of the T matrix. Under these conditions, the TS value is 0.338935. In the T matrix, criteria are interpreted by coloring the values below the TS value. Whether the results are above the TS value or not indicates the effects of the criteria. In cells above the TS value; rows affect the values in the column.

Table:11 Total Relation Matrix T with Remark According to TS Value

T	K1 (speed and engine power)	K2 (weight-maneuverability)	K3(fire power)	K4(Survivability)
K1 (speed and engine power)	0	0	0	0,451306
K2 (weight-maneuverability)	0,592918	0	0	0,603003
K3(fire power)	0,463072	0,409897	0	0,65805
K4(Survivability)	0,576109	0,466396	0	0,357701

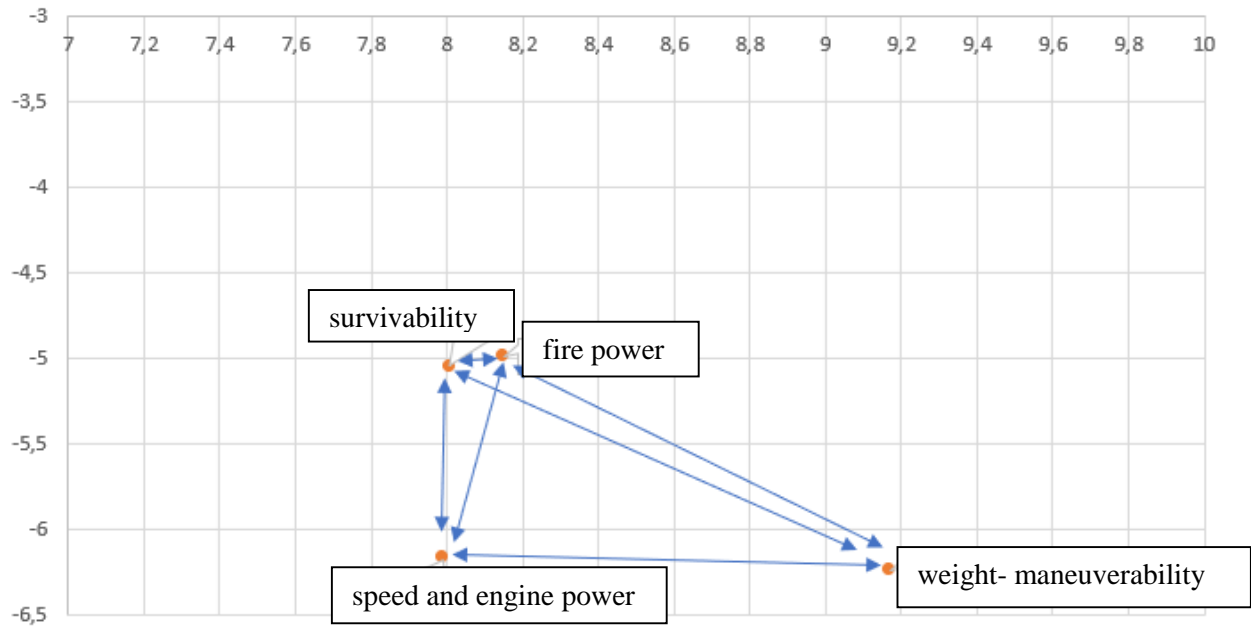


Figure 7: Cause- Effect Diagram

Step 8: Calculating Criteria Weights

$$w_{ia} = \sqrt{(R + C)^2 + (R - C)^2}$$

$$w_i = \frac{w_{ia}}{\sum_{i=1}^n w_{ia}} \quad (4)$$

Criterion weights were calculated as follows:

Speed and engine power 0.242742, weight-maneuverability 0.266549, firepower 0.240248, survivability 0.250461.

ALTERNATIVE RANKING WITH TOPSIS IN ACCORDANCE WITH DEMATEL VALUES

TOPSIS (Technique for Order Preference by Similarity) Method

It is an MCDM method developed by Hwang and Yoon in 1980 and has found application in many areas. Evaluation of alternatives (decision options) is based on two basic points: positive ideal solution and negative ideal solution. In the TOPSIS method, it is aimed to determine the decision option that has the shortest distance to the positive ideal solution and the farthest distance to the negative ideal solution.

The application of the TOPSIS method is as follows:

Step 1: Creating the Decision Matrix

Table:12 Decision Matrix

	K1 (speed and engine power)	K2 (weight- maneuverability)	K3(fire power)	K4(survivability)
M48A5T2	48	48,5	105	3
LEOPARD 1	65	42,2	105	1
M60A3	48	52	105	3
LEOPARD 2A4	72	55,1	120	6
M60T	48	55	120	3

Note: Survivability values are weighted by evaluating the armoring in terms of RHA thickness before modernization activities and scoring it out of 10.

Step 2: Normalizing the Decision Matrix

$$r_{ij} = x_{ij} / \sqrt{\sum_1^n x_{ij}^2} \quad (5)$$

To normalize the decision matrix, we divide the values in the cells by the square root of the sum of the squares of the values in the same column.

Table:13 Normalized Decision Matrix

	K1 (speed and engine power)	K2 (weight- maneuverability)	K3(fire power)	K4(survivability)
M48A5T2	0,375723064	0,42705014	0,422115882	0,375
LEOPARD 1	0,508791649	0,371577648	0,422115882	0,125
M60A3	0,375723064	0,457868192	0,422115882	0,375
LEOPARD 2A4	0,563584596	0,48516418	0,482418151	0,75
M60T	0,375723064	0,484283664	0,482418151	0,375

Step 3: Calculating the Weighted Normalized Decision Matrix

$$v_{ij} = r_{ij} \times w_j \quad (6)$$

Step 4: Deciding on Positive and Negative Ideal Solutions

After multiplying our normalized values by our weight coefficients, we get the best and worst values of the columns. For negative impact criteria, the best value is the smallest and the worst value is the largest. In this case, the negative impact criteria are as follows.

$$\begin{aligned} A^+ &= \{(\max v_{ij} \mid j \in J), (\min v_{ij} \mid j \in J')\} \\ A^- &= \{(\min v_{ij} \mid j \in J), (\max v_{ij} \mid j \in J')\} \end{aligned} \quad (7)$$

Table:14 Ideal Solutions and Weighted Values According to DEMATEL Weights

	K1 (speed and engine power)	K2 (weight-maneuverability)	K3 (fire power)	K4 (survivability)
M48A5T2	0,091203768	0,113829788	0,101412497	0,093922875
LEOPARD 1	0,123505102	0,09904365	0,101412497	0,031307625
M60A3	0,091203768	0,122044309	0,101412497	0,093922875
LEOPARD 2A4	0,136805652	0,129320027	0,115899996	0,18784575
M60T	0,091203768	0,129085326	0,115899996	0,093922875

A+	0,091203768	0,09904365	0,115899996	0,18784575
A-	0,136805652	0,129320027	0,101412497	0,031307625

Step 5: Calculating the Separation Measures

$$S_i^+ = \sqrt{\sum_1^n (v_{ij} - v_j^+)^2}$$

$$S_i^- = \sqrt{\sum_1^n (v_{ij} - v_j^-)^2} \quad (8)$$

Step 6: Calculating Relative Closeness to Ideal Point

$$C_i = S_i^- / (S_i^- + S_i^+) \quad (9)$$

Table:15 Relative Closeness Calculation Based on Ideal Point

	S+	S-	Ci
M48A5T2	0,096177045	0,078994613	0,450955445
LEOPARD 1	0,160491272	0,033069073	0,170846322
M60A3	0,097777423	0,077801911	0,443115426
LEOPARD 2A4	0,054737472	0,1572071	0,741736855
M60T	0,098610389	0,078804467	0,444181898

Step 7: Ranking the Preference Order

We rank the alternatives according to their relative closeness to the ideal point. Our alternatives, from best to worst:

Table:16 Prioritized Preference Ranking

M48A5T2	2
LEOPARD 1	5
M60A3	4
LEOPARD 2A4	1
M60T	3

DISCUSSION

In this study, the criteria were weighted with the DEMATEL method, and the criterion weights were calculated as 0.242742 for speed and engine power, 0.266549 for weight-maneuverability, 0.240248 for firepower, and 0.250461 for survivability. When the TOPSIS method is applied to this weighting, the alternatives are listed as: 1) LEOPARD 2A4 tank, 2) M48A5T2 tank, 3) M60T tank, 4) M60A3 tank, 5) LEOPARD 1 tank.

CONCLUSION

A comparison was made regarding the suitability of tanks in terms of their suitability for modernization. The study was based on the condition of the tanks before modernization. While criteria weighting is done with the DEMATEL method, the weighted criteria are: speed and engine power (speed-based maneuverability is taken as basis since it affects the tank's mobility), weight-maneuverability (the effect of the tank's weight on its mobility is taken as basis), firepower (the diameter of the tank's existing tank gun is taken as basis), survivability (survivability-armor status). When the criteria were weighted with the DEMATEL method, the effect of weight on maneuverability and survivability criteria were calculated more heavily than others.

When the criteria weighted by the TOPSIS method were ranked and prioritized, the weights (tons), speeds (km/h), firepower (tank gun diameters) and survivability (scoring of armor RHA thicknesses out of 10) of our tanks in the Turkish Armed Forces inventory were taken into account.

As a result of the decision-making problem, the suitability of the LEOPARD 2A4 tank for modernization was higher than other tanks due to its superior existing capabilities. It should not be forgotten that the fundamental need for modernization is the need for operations. This study includes the comparison of the conditions of existing tanks under optimum conditions. There are currently tanks in the inventory that have undergone/are being modernized, and renovation activities will undoubtedly continue as an inevitable result of combat requirements.

ACKNOWLEDGEMENTS

I would like to express my endless gratitude and respect to Dear Assoc. Prof. A. Feyzioglu, Dear PhD-c H. Haliloglu who helped me to do this work, my esteemed Lieutenant S. Inan who inspired me, my family for their unwavering support, and of course the glorious Turkish Armed Forces.

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NEW SCIENTIFIC DISCOVERIES AND INVENTIONS BASED ON THE SIMILARITY PRINCIPLE IN THE UNIVERSE

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Abstract

In numerous scientific research endeavors, thanks to similar principles and philosophies in the universe, we can conduct scientific research to discover and find new scientific problems.

In this article, we have applied this principle to study various scientific issues in our field and have obtained significant findings.

For example, based on the philosophy of dual approach, we average the physical quantities of velocity and pressure in the Navier-Stokes equations of fluid mechanics. The obtained equation using this approach has many more advantages compared to equations built by the classical method.

Similarly, based on the law of incompleteness or the law of the duality nature in the universe or the relative strengths of each research methodology, it becomes apparent that each method possesses its own sets of advantages and limitations. Therefore, it is essential to combine these methods to leverage the strengths of each, enhancing their efficacy in addressing concerned problems.

Particularly, in mechanics, combining numerical methods to solve partial differential equations. In medicine, the treatment of some complex diseases often requires the integration of traditional (or Eastern medicine) and Western medicine, such as in the treatment of chronic colitis, kidney stones.

Keywords: new scientific discoveries and inventions, similarity principle in the universe, duality nature in the universe, Navier-Stokes equations, combining numerical methods, treatment of chronic colitis.

INTRODUCTION

It appears that all problems in the world around us adhere to universal laws that are applicable across specialized fields. Therefore, we can rely on these universal laws to conduct research in our specific area of study. In this article, we present some universal principles, philosophies, and laws that we have applied or combined into specialized research. Some specific results have been obtained as follows:

Applying the rule of duality approach to build fundamental equations in fluid mechanics.

Applying the law of incompleteness or the two-sided nature of advantages and disadvantages inherent in the universe to coordinate numerical methods in solving problems in mechanics. Additionally, integrating traditional medicine (or Eastern medicine) with Western medicine to treat certain chronic diseases.

APPLYING UNIVERSAL PRINCIPLES, PHILOSOPHIES, AND RULES TO SPECIALIZED SCIENTIFIC RESEARCH

In this section, we will delve deeper into the presentation of two universal principles, philosophies, and laws that we have successfully applied in specialized research.

- + Philosophy of application of duality approach in the field of fluid mechanics;
- + The law of incompleteness or the duality in the universe.

a- Philosophy of application of duality approach in the field of fluid mechanics

The duality philosophy emphasizes the importance of addressing problems from multiple perspectives: from bottom-up, top-down, left to right and vice-versa; from inside to outside, and vice-versa. For instance, to throw an object a great distance, we must first pull our arm back in the opposite direction. Similarly, in pursuit of victory, we might sometimes need to accept defeat to preserve our strength.

With such considerations, it is believed that if we want to find an accurate average value of a quantity (velocity, pressure...), why do we only average it once, rather than multiple times? Which value is more general: the local average or the global average? Previously, when calculating the average value of a quantity $y(t)$, one only used the global average value (GAV) through integration $\bar{y}(t)$ (Reynolds, 1895; Frank M. White, 1991; Nguyen Dong Anh, 2012):

$$\bar{y}(t) = \frac{1}{T} \int_0^T y(t).dt$$

(1)

where

t is time; T is the fluctuating period of the quantities to be integrated.

Why do not we utilize additional local average values (LAV) or multiple local average values, or even a combination of both? This thought necessitates a rigorous mathematical proof to determine specifically which averaging approach is optimal. Mathematical results has demonstrated that combining global and local average value (GLAV) delivers a superior average value $\overline{\overline{y}}(t)$ (Nguyen Dong Anh, 2012):

$$\overline{\overline{y}}(t) = \frac{1}{T} \int_0^T \frac{1}{r} \int_0^r y(t).dt.dr$$

(2)

where

$r < T$; r and T are time.

We applied GLAV to average the basic equations in fluid mechanics and we obtained the following typical results:

For the first time, the Navier-Stocks equation, a cornerstone of fluid mechanics, has been averaged using the duality approach (T.H Nguyen and D.A. Nguyen, 2023), we have obtained a more comprehensive system of equations than the average system of equations compared to the conventional averaging method pioneered by Reynolds in 1895.

Furthermore, applying this duality method, we have re-defined the two-dimensional horizontal, two-dimensional vertical, and one-dimensional flow equations, alongside tracer transport equations, and established other characteristic quantities in mechanics (H. Nguyen-The, 2017; Tinh Ton That et al., 2019; The Hung Nguyen et al., 2020; H. Nguyen-The, 2020; The Hung Nguyen, 2021; T.H. Nguyen and D.A Nguyen, 2023; The Hung Nguyen, 2023). The results of building these systems of equations are as follows:

Averaging the three-dimensional (3D) Navier-Stocks equations using the dual approach (T.H Nguyen and D.A. Nguyen, 2023), we get the following velocity or pressure as follows:

$$\overline{y_j} \equiv \overline{y(t_j)} = A_0 / 2 + \Delta DA$$

(3)

where

$A_0 / 2$ is the average quantity of Σy_j , calculated by the original ideal of Reynolds (1895), also called classical RANS equations.

ΔDA is the difference of velocity or pressure quantities, when averaging these quantities with respect to the duality approach, compared with the classical RANS equations:

$$\Delta DA = \frac{-1}{2\pi N^2} \left(\sum_{p=1}^{N/2} \frac{B_p}{p} \right)$$

(4)

where

$$B_p = \frac{2}{N} \sum_{n=1}^N y_n \cdot \sin(2\pi pn/N); p = 1, 2, \dots, N/2$$

(5)

N is the sum of instantaneous velocity or pressure data values (u, v, w, p) measures in time T ; p indicates the p th (for $p > N/2$ these trigonometric harmonics will repeat); t_n is time to calculate, $t \equiv t_j \equiv t_n = n \cdot \Delta t$; n is time increment step.

The system of two-dimensional horizontal flow equations (2DH) is obtained from the duality approach (Tinh Ton That et al., 2019):

$$\begin{cases} \frac{\partial H^2}{\partial t} + \frac{\partial}{\partial x} [\alpha_1 \overline{U_c} H^2] + \frac{\partial}{\partial y} [\beta_1 \overline{V_c} H^2] = 0 \\ \frac{\partial}{\partial t} [\alpha_1 \overline{U_c} H^2] + \frac{\partial}{\partial x} [\alpha_2 \overline{U_c} \overline{U_c} H^2] + \frac{\partial}{\partial y} [\alpha_3 \overline{U_c} \overline{V_c} H^2] = -gH^2 \frac{\partial \eta}{\partial x} + \left(\alpha_4 E_x^c \frac{\partial^2 \overline{U_c}}{\partial x^2} + \alpha_5 E_y^c \frac{\partial^2 \overline{U_c}}{\partial y^2} \right) H^2 + \frac{2\rho_a}{\rho} C^* W_x \cdot W \cdot H \\ -2g \cdot \alpha_1 \overline{U_c} \cdot n^2 \sqrt{\alpha_1^2 \overline{U_c}^2 + \beta_1^2 \overline{V_c}^2} / H^{-2/3} + 2\sigma \cdot \beta_1 \overline{V_c} \cdot H^2 \cdot \sin \theta; \\ \frac{\partial}{\partial t} [\beta_1 \overline{V_c} H^2] + \frac{\partial}{\partial x} [\beta_2 \overline{U_c} \overline{V_c} H^2] + \frac{\partial}{\partial y} [\beta_3 \overline{V_c} \overline{V_c} H^2] = -gH^2 \frac{\partial \eta}{\partial y} + \left(\beta_4 E_x^c \frac{\partial^2 \overline{V_c}}{\partial x^2} + \beta_5 E_y^c \frac{\partial^2 \overline{U_c}}{\partial y^2} \right) H^2 + \frac{2\rho_a}{\rho} C^* W_y \cdot W \cdot H \\ -2g \cdot \beta_1 \overline{V_c} \cdot n^2 \sqrt{\alpha_1^2 \overline{U_c}^2 + \beta_1^2 \overline{V_c}^2} / H^{-2/3} + 2\sigma \cdot \alpha_1 \overline{U_c} \cdot H^2 \cdot \sin \theta; \end{cases}$$

(6)

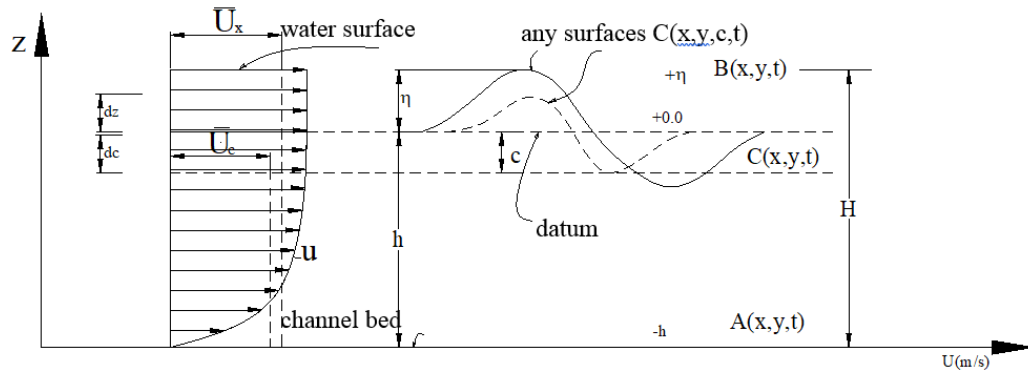


Figure 1. Sketch describing velocity profile in the x direction

where

In which \bar{u}_c, \bar{v}_c are the average velocity component from the bed to any surface $C(x,y,t)$, correspondent the x and y direction; \bar{u}_x, \bar{v}_x are the average velocity components from the bed to the water surface in x and y direction; $E_{xx}^c, E_{yy}^c, E_{xx}^c, E_{yy}^c$ are eddy viscosity; ρ is the specific gravity of the water; g is the gravitational acceleration; $\alpha_1, \beta_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are the correct coefficients; C^* is the drag coefficient of wind; W_x, W_y are the components of wind velocity in x and y directions respectively; W is the principle wind velocity; ω is the speed of rotation of the earth; θ is the angle to the equator; η is the water level compared to the datum (**Figure 1**).

The system of two-dimensional vertical flow equations (2DV) is obtained from the duality approach (The Hung Nguyen, 2023):

$$\begin{cases} \beta_{1c} \frac{\partial}{\partial x} [\bar{u}.b^2] + \delta_{1c} \frac{\partial}{\partial z} [\bar{w}.(b^2)] = 0 \\ \alpha_{1ix} \cdot \frac{\partial}{\partial t} \{\bar{u}.(b^2)\} + \beta_{1ix} \frac{\partial}{\partial x} \{(\overline{uu}).(b^2)\} + \delta_{1ix} \frac{\partial}{\partial z} \{(\overline{uw}).(b^2)\} = \frac{1}{\rho} .F_x.(b^2) - \frac{1}{\rho} .\frac{\partial p}{\partial x} .(b^2) + \frac{1}{\rho} \text{div}(\vec{\tau})_x.(b^2) - \frac{1}{\rho} (\vec{\tau}.\vec{n})_x.(b) \\ \alpha_{1iz} \frac{\partial}{\partial t} \{\bar{w}.(b^2)\} + \beta_{1iz} \frac{\partial}{\partial x} \{(\overline{wu}).(b^2)\} + \delta_{1iz} \frac{\partial}{\partial z} \{(\overline{ww}).(b^2)\} = \frac{1}{\rho} .F_z.(b^2) - \frac{1}{\rho} .\frac{\partial p}{\partial z} .(b^2) + \frac{1}{\rho} \text{div}(\vec{\tau})_z.(b^2) - \frac{1}{\rho} (\vec{\tau}.\vec{n})_z.(b) \end{cases}$$

(7)

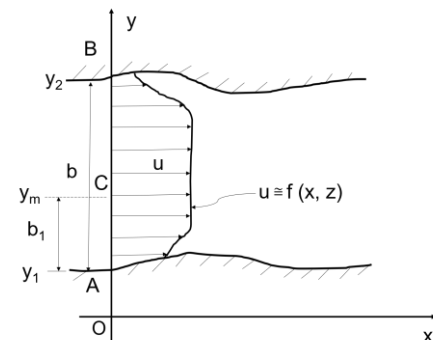


Figure 2. Sketch of the construction of 2DV using the dual approach

where

b is the river width; b_1 is the intermediate variable ($b_1 < b$); \bar{u}, \bar{w} are the averaged velocity components along the river width in the Ox, Oz directions respectively; F_x, F_z are the components of the resultant external force in the x and z directions respectively; p is the average pressure

component; $(\vec{\tau})_x$, $(\vec{\tau})_z$ are the stresses in the Ox and Oz directions respectively; \vec{n} is the boundary normal vector; $(\vec{\tau} \cdot \vec{n})_x$, $(\vec{\tau} \cdot \vec{n})_z$ is the side-wall friction in the Ox and Oz directions respectively; ρ is the density of water; α_{1tx} , α_{1tz} , β_{1x} , β_{1z} , δ_{1x} , δ_{1z} , β_{1c} , δ_{1c} , are correction factors with a value close 1 (**Figure 2**).

The system of one-dimensional (1D) flow equations is obtained from the duality approach (The Hung Nguyen, 2023):

$$\begin{aligned} \frac{\partial(AH)}{\partial t} + \frac{\partial}{\partial x}(\alpha_{1c}HQ) &= 0 \\ \frac{\partial}{\partial t}(\alpha_1.HQ) + \frac{\partial}{\partial x}(\alpha_2.\frac{HQ^2}{A}) &= -gH^2 \frac{\partial Z_s}{\partial x} + \nu H \frac{\partial^2 Q}{\partial x^2} - gAHS_f \end{aligned} \quad (8)$$

where

A is the cross-sectional area; H is the depth of flow; Q is the discharge; Z_s is the water surface elevation; ν is the kinematic viscosity coefficient; and S_f is the frictional slope of the river bed; g is the gravitational acceleration; α_1 , α_2 , α_{1c} are the correction factors with values close 1.

Averaging the three-dimensional (3D) tracer transport equation using the duality approach (The Hung Nguyen, 2023), we get the following velocity or tracer concentration $\bar{y}_j \equiv \bar{y}(t_j)$ as follows:

$$\bar{y}_j \equiv \bar{y}(t_j) = A_0 / 2 + \Delta DA \quad (9)$$

where

$A_0 / 2$ is the average quantity of Σy_j , calculated by the original ideal of Reynolds (1895), also called classical RANS equations.

ΔDA is the difference of tracer concentration quantities, when averaging these quantities with respect to the duality approach, compared with the classical RANS equations,

$$\Delta DA = \frac{-1}{2\pi N^2} \left(\sum_{p=1}^{N/2} \frac{B_p}{p} \right)$$

(10)

where

$$B_p = \frac{2}{N} \sum_{n=1}^N [y_n \cdot \sin(2\pi pn/N)]; p = 1, 2, \dots, N/2$$

(11)

N is the sum of instantaneous tracer concentration data values C measures in time T; p indicates the pth (for $p > N/2$ these trigonometric harmonics will repeat); t_n is time to calculate, $t \equiv t_j \equiv t_n = n \cdot \Delta t$; n is time increment step.

The 2DH tracer transport equation is obtained from the duality approach (H. Nguyen-The, 2017) as follows:

$$\begin{aligned} \left\{ \frac{1}{2} \cdot \frac{\partial}{\partial t} \{ \bar{C}(Z_s^2 - Z_b^2) \} - \alpha_{12} \bar{C} \left\{ \frac{\partial}{\partial t} (Z_s^2 - Z_b^2) \right\} + \frac{1}{2} \beta_2 \frac{\partial}{\partial x} \{ \overline{UC} \cdot (Z_s^2 - Z_b^2) \} - \beta_1 \beta_3 \overline{UC} \frac{\partial}{\partial x} (Z_s^2 - Z_b^2) + \frac{1}{2} \delta_2 \cdot \frac{\partial}{\partial y} \{ \overline{VC} \cdot (Z_s^2 - Z_b^2) \} \right. \\ \left. - \delta_1 \delta_3 \cdot \overline{VC} \frac{\partial}{\partial y} (Z_s^2 - Z_b^2) = \frac{1}{2} \cdot \gamma_1 \cdot \gamma_2 \frac{\partial}{\partial x} \left\{ (D + \varepsilon_x) \cdot \frac{\partial \bar{C}}{\partial x} \right\} \cdot (Z_s^2 - Z_b^2) + \frac{1}{2} \cdot \theta_1 \cdot \theta_2 \frac{\partial}{\partial y} \left\{ (D + \varepsilon_y) \cdot \frac{\partial \bar{C}}{\partial y} \right\} \cdot (Z_s^2 - Z_b^2) \right\} \end{aligned}$$

(12)

where

\bar{C} is the average concentrations on the depth h ($h = Z_s - Z_b$); \bar{U} , \bar{V} are the average velocity components from the bed Z_b to the water surface Z_s in x and y direction; ε_x , ε_y are eddy viscosity; D is the dispersion tracer concentration; α_{12} , β_1 , β_2 , β_3 , γ_1 , γ_2 , θ_1 , θ_2 , δ_1 , δ_2 , δ_3 are the correction factors with values close 1 (**Figure 3**).

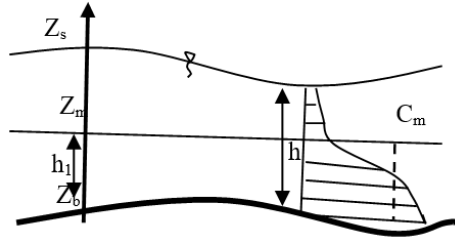


Figure 3. Sketch for constructing the 2DH solute transport equation using the dual approach

The 2DV tracer transport equation is obtained from the duality approach (H. Nguyen The, 2020) as follows:

$$\left\{ \frac{1}{2} \cdot \frac{\partial}{\partial t} \{ \bar{C} (Y_2^2 - Y_1^2) \} - \alpha_{12} \bar{C} \left\{ \frac{\partial}{\partial t} (Y_2^2 - Y_1^2) \right\} + \frac{1}{2} \beta_2 \frac{\partial}{\partial x} \{ \bar{U} C \cdot (Y_2^2 - Y_1^2) \} - \beta_1 \beta_3 \bar{U} C \frac{\partial}{\partial x} (Y_2^2 - Y_1^2) + \frac{1}{2} \delta_2 \cdot \frac{\partial}{\partial z} \{ \bar{W} C \cdot (Y_2^2 - Y_1^2) \} \right. \\ \left. - \delta_1 \delta_3 \cdot \bar{W} C \frac{\partial}{\partial z} (Y_2^2 - Y_1^2) = \frac{1}{2} \cdot \gamma_1 \cdot \gamma_2 \frac{\partial}{\partial x} \left\{ (D + \varepsilon_x) \cdot \frac{\partial \bar{C}}{\partial x} \right\} \cdot (Y_2^2 - Y_1^2) + \frac{1}{2} \cdot \theta_1 \cdot \theta_2 \frac{\partial}{\partial z} \left\{ (D + \varepsilon_z) \cdot \frac{\partial \bar{C}}{\partial z} \right\} \cdot (Y_2^2 - Y_1^2) \right.$$

(13)

where

\bar{C} is the average concentrations on the width b ($b = Y_2 - Y_1$); \bar{U} , \bar{W} are the average velocity components from the right bank Y_1 and the left bank Y_2 in x and z direction respectively; ε_x , ε_z are eddy viscosity; D is the molecular diffusion coefficient of tracer concentration; α_{12} , β_1 , β_2 , β_3 , γ_1 , γ_2 , θ_1 , θ_2 , δ_1 , δ_2 , δ_3 are the correction factors with values close 1 (**Figure 4**).

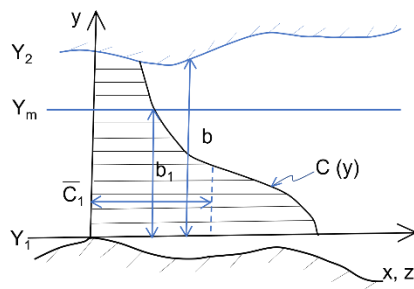


Figure 4. Sketch for constructing the 2DV solute transport equation using the dual approach

The 1D tracer transport equation is obtained from the duality approach (H. Nguyen The, 2020) as follows:

$$\frac{\partial}{\partial t} \{ \bar{C} (Z_s^2 - Z_b^2) \} + \frac{\partial}{\partial t} \{ \bar{C} (Y_2^2 - Y_1^2) \} + \frac{\partial}{\partial x} \{ \bar{U} C \cdot (Z_s^2 - Z_b^2) \} + \frac{\partial}{\partial x} \{ \bar{U} C \cdot (Y_2^2 - Y_1^2) \} = \\ \frac{\partial}{\partial x} \left\{ (D + \varepsilon_x) \cdot \frac{\partial \bar{C}}{\partial x} \right\} \cdot (Z_s^2 - Z_b^2) + \frac{\partial}{\partial x} \left\{ (D + \varepsilon_x) \cdot \frac{\partial \bar{C}}{\partial x} \right\} \cdot (Y_2^2 - Y_1^2)$$

(14)

where

\bar{C} is the average concentrations on the cross-sectional area A ($h = Z_s - Z_b$, $b = Y_2 - Y_1$); \bar{U} is the average velocity on the cross-sectional area A ; ε_x is the eddy viscosity; D is the molecular diffusion coefficient of tracer concentration;

b- The law of incompleteness or the duality in the universe

In the universe, most numerical methods have both advantages and disadvantages. What may be beneficial in one scenario may transform into a drawback in another. There are numerous situations where the integration of methods becomes essential for achieving a more efficient resolution to scientific or practical challenges. Some typical results that we have obtained by leveraging this property for research are as follows:

Combining the finite difference and finite element methods to solve specialized problems:

To solve some problems in fluid mechanics effectively, we have combined these two numerical methods to leverage the strengths of each (Huynh Phuc Hau et al., 2018; Huynh Van Hiep et al., 2017; Nguyen The Hung, 1990; Nguyen The Hung and Hoang Tu An, 1990; Nguyen The Hung, 1995; Nguyen The Hung, 2003; Nguyen The Hung and Thai Hoang Phong, 2006; Nguyen The Hung and Tran Van Minh, 2008; Le Van Nghi et al., 2004; Tran Van Minh and Nguyen The Hung, 2004). Specifically, the finite difference method excels in resolving the temporal dimension due to its simplicity, while the finite element method is used to resolve the spatial dimension. Some typical research results are as follows:

Combining the finite difference and finite element methods to solve the 2DH flow problems (Nguyen The Hung, 1995; Nguyen The Hung, 2003; Tran Van Minh and Nguyen The Hung, 2004; Nguyen The Hung and Tran Van Minh, 2008):

$$\begin{aligned} \frac{h^{n+1} - h^n}{DT} + \bar{u} \cdot \overrightarrow{\text{grad}}(h) + h \text{div}(\bar{u}) &= 0 \\ \frac{u^{n+1} - u^n}{DT} + \bar{u} \cdot \overrightarrow{\text{grad}}(u) &= -g \frac{\partial Z}{\partial x} + F_x + \frac{1}{h} \text{div}(h v_t \overrightarrow{\text{grad}}u) \\ \frac{v^{n+1} - v^n}{DT} + \bar{u} \cdot \overrightarrow{\text{grad}}(v) &= -g \frac{\partial Z}{\partial y} + F_y + \frac{1}{h} \text{div}(h v_t \overrightarrow{\text{grad}}v) \end{aligned}$$

(15)

where

In which u , v are the average velocity component from the bed to the water surface in x and y directions respectively; v_t is eddy viscosity; g is the gravitational acceleration; h is the water depth; Z is water surface level; F_x , F_y are the components of the resultant external force in the x and z directions respectively; DT ($DT = t^{n+1} - t^n$) is time step.

Combining the finite difference and finite element method to solve the two-dimensional vertical flow problems (Nguyen The Hung and Hoang Tu An, 1990; Le Van Nghi et al., 2004):

$$\begin{cases} \frac{\partial u}{\partial t} + u \frac{\partial u}{\partial x} + w \frac{\partial u}{\partial z} = -\frac{1}{\rho} \frac{\partial p}{\partial x} + \frac{\partial}{\partial x} \left(K_{xx}^M \frac{\partial u}{\partial x} \right) + \frac{\partial}{\partial z} \left(K_{xz}^M \frac{\partial u}{\partial z} \right) \\ \frac{\partial w}{\partial t} + u \frac{\partial w}{\partial x} + w \frac{\partial w}{\partial z} = -g - \frac{1}{\rho} \frac{\partial p}{\partial z} + \frac{\partial}{\partial x} \left(K_{zx}^M \frac{\partial w}{\partial x} \right) + \frac{\partial}{\partial z} \left(K_{zz}^M \frac{\partial w}{\partial z} \right) \\ \frac{\partial(b.u)}{\partial x} + \frac{\partial(b.w)}{\partial y} = 0 \end{cases}$$

(16)

where

b is the river width; u , w are the averaged velocity components along the river width in the Ox, Oz directions respectively; p is the average pressure component; ρ is the density of water; g is gravitational acceleration; K_{xx}^M , K_{xz}^M , K_{zx}^M , K_{zz}^M are the eddy viscosity coefficient.

Combining the finite difference and finite element methods to solve the system of equations for phreatic aquifer and confined aquifer (Huynh Van Hiep et al., 2017; Tran Van Minh and Nguyen The Hung, 2004), (Figure 5.) as follows:

$$\begin{cases} -\left[\frac{\partial}{\partial x} (\alpha T_x \frac{\partial f}{\partial x}) + \frac{\partial}{\partial y} (\alpha T_y \frac{\partial f}{\partial y}) \right] + \left[\frac{\partial}{\partial x} (\alpha T_{ax} \frac{\partial h}{\partial x}) + \frac{\partial}{\partial y} (\alpha T_{ay} \frac{\partial h}{\partial y}) \right] = I_f + I_s + q_f + q_s \\ S_0 \frac{\partial h}{\partial t} - \left\{ \frac{\partial}{\partial x} (\alpha T_{ax} \frac{\partial h}{\partial x}) + \frac{\partial}{\partial y} (\alpha T_{ay} \frac{\partial h}{\partial y}) \right\} + \left\{ \frac{\partial}{\partial x} (\alpha T_x \frac{\partial f}{\partial x}) + \frac{\partial}{\partial y} (\alpha T_y \frac{\partial f}{\partial y}) \right\} = -I_s - q_s \end{cases} \quad (17)$$

where

$$f = \frac{(1-\beta)h_f + \beta\phi_f}{\alpha}; \quad \alpha = \frac{\rho_s - \rho_f}{\rho_f}; \quad h_f = z + \frac{p}{\rho_f g} \quad (18a)$$

$$T_x = K_x [H_1 + (1-\beta)h_f - \beta H_2]; \quad T_y = K_y [H_1 + (1-\beta)h_f - \beta H_2] \quad (18b)$$

$$T_{ax} = T_x \frac{(H_1 - h)}{[H_1 + (1-\beta)h_f - \beta H_2]}; \quad T_{ay} = T_y \frac{(H_1 - h)}{[H_1 + (1-\beta)h_f - \beta H_2]} \quad (18c)$$

and

+ for the case of phreatic aquifer $\beta = 0$;

+ for the case of confined aquifer $\beta = 1$.

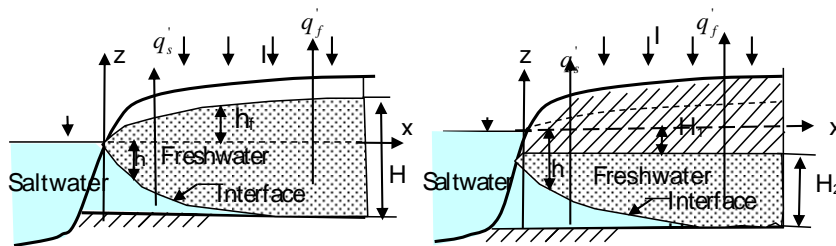


Figure 5. Coastal aquifer with fresh and salt groundwater

(a). Phreatic coastal aquifer; (b). Confined coastal aquifer

Combining Eastern and Western medicine to cure some complex diseases

Some incurable diseases cannot be effectively treated by either Eastern or Western medicine. This indicates that each approach individually lacks sufficient advantages to cure these diseases. Therefore, combining multiple methods is necessary to harness sufficient advantages to effectively cure these incurable diseases. Some typical research results for curing some incurable diseases are as follows:

+ Combining traditional medicine, such as berberine, with Western medicine, like direxioide, offers a promising treatment for chronic colitis induced by dysentery bacteria. Berberine used in this case is produced by a pharmaceutical factory in Binh Dinh province, Vietnam. Initially, Berberine is used to regulate dysentery amides and promote the healing of colon ulcers caused by them. Subsequently, direxioide is employed to eradicate the dysentery amides (Nguyen The Hung, 2024).

+ Combining traditional and Western medicine for comprehensive treatment of kidney stones involves using endoscopy, a Western medicine technique, to monitor the stone's location and size in the kidney. In conjunction, traditional medicine, primarily herbal remedies, requires consistent long-term intake (about 1.5 years) to gradually dissolve the kidney stones and restore normal kidney function; preventing further stone formation (Nguyen The Hung, 2024).

CONCLUSION

The research outcomes we have achieved above are a result of applying similar principles and philosophies of the universe, leveraging multidisciplinary scientific knowledge, integrating accomplishments from various domains, enabling to uncover novel scientific problems. The development of new fundamental equations in fluid mechanics, the resolution of problems through the integration of numerical methods such as finite difference and finite element methods, or the treatment of incurable diseases such as chronic colitis and kidney stones, all rooted in the combination of multidisciplinary science.

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HOW AGE AFFECTS THE EVALUATION OF THE CONCEPT OF BEAUTY

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Abstract

The concept of beauty is often expressed but, as yet, does not have a satisfactory definition. Its content remains the subject of ongoing research – one way to analyse the use of the concept of beauty is to examine its use in a natural language through the method of semantic differentials. Previous studies, however, have indicated the need to incorporate possible intervening variables into these analyses. A study with a sample of 2,095 adults examined the relationship between the evaluation of the concept of beauty, through twenty-one bipolar adjectives of the semantic differential (grouped into meta-categories of activity, evaluation, and potency), and the age of the participants. Based on the results from a Spearman's non-parametric correlation, it was found that the majority (eleven) of bipolar adjectives used to characterise the concept of beauty (particularly in the potency dimension) have a statistically significant correlation with age. With increasing age, the concept of beauty is characterised as simpler, more understandable, logical, knowable, orderly, balanced, and less impulsive, exciting, and inspiring. Interpretation of the results suggests a gradual tendency towards calmness and a greater degree of stability in older individuals, along with the possibility of a greater degree of self-knowledge or more accurate identification (based on a greater volume of experience) of the key characteristics that define beautiful objects. For further research, an examination of the cultural and societal preferences and trends that influence the formation of the content of the concept of beauty, as well as other possible intervening variables (e.g., gender) might prove to be important.

Keywords: beauty, concept, semantic differential, age, natural language.

INTRODUCTION

The concept of beauty belongs to the category of highly elusive and multidimensional concepts. Despite prolonged historical scrutiny (Eco, 2012), along with its frequent contemporary use, it still lacks a clear definition. The reasons lie in the multi-etiological character of its content, the concept of beauty is influenced, for example, by cultural (Ridley, 2022) and historical contexts (Dimitrov & Kroumpouzou, 2023), as well as evolutionarily conditioned heuristics (Little et al., 2011). The diversity of the concept of beauty is also determined by the preferred aspects of those investigating it, they depend on the scientific discipline of those carrying out the study, the language used within different scientific disciplines may differ, and similarly sounding terms may not carry the same content. Thus, within different areas of study the concept of beauty may acquire different meanings (Lellouche, 2013). A precise delineation of the concept of beauty also necessitates a consideration of the method of investigation through which the content of the concept was analysed. The method, from the Greek "methodos" = path to the goal (Králik, 2015), is both a path to and decisive tool for the acquisition of knowledge. However, the path, as a way to grasp the problem, simultaneously and

directly conditions the conclusions we reach about the object under investigation – the method used predetermines what we can learn about the object of study (Maul, 2013).

In addition to the general determinants of the concept of beauty, it is necessary to consider the influence of individually conditioned variables. In this regard, only a few studies have so far been conducted – for example, Demuthova & Demuth identified several gender related differences in the understanding of the concept of beauty; women perceive beauty as a concept that is significantly more strongly associated with evaluative judgments than men (Demuthova & Demuth, 2023^B) and women also differentiate the concept of beauty from related concepts (such as goodness) to a greater degree than men (Demuthova & Demuth, 2023^A). Content analysis of the connotations of the concept of beauty revealed that women more often associate this term with inner contentment and their role in the family, while men statistically more often mention connotations related to leisure activities (Vavrova & Demuthova, 2021). Demuthova & Demuth further examined differences in the semantic differential of the concept of beauty in respondents with academic or artistic educations (Demuthova & Demuth, 2024). Individuals with a lower level of academic education perceive beauty to be generally more active than those with a higher level of education. Individuals with an artistic education rated beauty as something that is highly inspirational, inviting, and pleasant. On the other hand, individuals without an artistic education perceived beauty to be less inspirational, inviting, and pleasant (Demuthova & Demuth, 2024). However, in interpreting the findings of these studies (for an overview, see Demuthova et al., 2024), the need to further investigate interacting variables emerged, with a need to focus attention on the age of the participants.

Throughout ontogeny, an adult individual naturally progresses towards the fulfilment of the developmental tasks that arise during specific ontogenetic periods (Seiffge-Krenke & Gelhaar, 2008). The initial phases of adulthood are primarily focused on maturation, young adulthood is characterised by an orientation towards intimate relationships and partnerships, midlife and late adulthood are typified by generativity, while in old age, the continuation of the line and fulfilment of life itself acquire specific significance (Erikson, 1966). An orientation towards these different domains brings about changes in activities, preferences, values, etc., within the individual; at different periods of life, the tastes of an individual changes, as do their preferences. Evolutionary psychology, in the context of an evaluation of the beauty of objects, explains why, for example, the attractiveness of others is particularly important during the reproductive periods of life and why these preferences decline with age (Maestripieri et al., 2014). These findings mainly relate to the assessment of the physical attractiveness of an individual – but does age also have an influence on the general concept of beauty? Research in this area is lacking – hence, research questions were formulated in relation to the outlined problem.

OBJECTIVES AND RESEARCH QUESTIONS

The main aim of the study is to analyse the relationship between age and the concept of beauty and to establish possible age-related determinations of areas/characteristics of the concept of beauty based on the results. In connection with these aims, the following research questions were formulated:

Research Question 1: Does the age of the evaluator affect the understanding of the concept of beauty?

Research Question 2: In which areas of the concept of beauty are age differences most prominently manifested?

METHOD

Instruments

The concept of beauty can be examined using various methods (for an overview, see Démuthová et al., 2024). For the purposes of our research, we chose to use the method of semantic differentials. This method allows the measurement of the subjective evaluations of individuals of a specific concept through a series of bipolar adjectives (Table 1). The participant rates, on a Likert scale, how close/far the concept of beauty is to one of the two opposing adjectives (e.g., good – bad, fast – slow, etc.) (Table 2).

Table 1. Bipolar adjective pairs within the activity, evaluation, and potency dimensions used to describe the concept of beauty

Dimensions	Activity	Evaluation	Potency
Bipolar Adjective Pairs	Exciting/Soothing	Inviting/Repulsive	Orderly/Chaotic
	Aggressive/Moderate	Inspiring/Boring	Balanced/Unbalanced
	Erotic/Romantic	Kind/Hateful	Understandable/Unintelligible
	Expressive/Inconspicuous	Calm/Restless	Logical/Illogical
	Strict/Lenient	Pure/Dirty	Knowable/Unknowable
	Impulsive/Judicious	Pleasant/Unpleasant	Familiar/Strange
	Fast/Slow	Good/Bad	Simple/Complicated

Source: Authors

Table 2. An example of the numeric adjective evaluation from the semantic differential method

Beauty is:								
	Strongly Agree	Agree	Slightly Agree	In the Middle	Slightly Agree	Agree	Strongly Agree	
Good	1	2	3	4	5	6	7	Bad
Fast	1	2	3	4	5	6	7	Slow

Source: Authors

The advantage of using the method of semantic differentials in comparison with other methods used to analyse concepts in language (for example, tracking connotations) is that in addition to providing information about the nature of the relationship between two concepts (in our case, the concept of beauty and a specific adjective), the result is quantifiable (indicating how closely the concept is associated with the given adjective) and, thanks to the bipolar nature of the scale, it measures both positive and negative variants of the relationship. By quantifying the evaluation it is also possible to make comparison – for example, between genders, or its relationship to other variables (e.g., age). For the evaluation of the concept of beauty, twenty-one bipolar adjective pairs were chosen, which were grouped into three higher-order categories – dimensions of activity, potency, and evaluation, in accordance with the original intent of the author of the method of semantic differentials, Ch. Osgood (1957). Previous studies have confirmed that these dimensions have relatively good internal consistency: ($\alpha_{\text{Activity}} = 0.698$; $\alpha_{\text{Evaluation}} = 0.751$; $\alpha_{\text{Potency}} = 0.771$) (see Demuthova & Demuth, 2023^B).

The variable, age, appeared in the results in two forms – as a scale variable, and to allow a better graphical representation of the development of the evaluation of individual adjectives at various life stages in adulthood, the participants were divided into six age groups: Group 1 – 18 to 25; Group 2 – 26 to 35; Group 3 – 36 to 45; Group 4 – 46 to 55; Group 5 – 56 to 65; and finally group 6, over 66.

Subjects and Procedure

The study was carried out with 2,095 participants from 18 to 89 years of age ($M = 41.34$; $SD = 16.46$); 46.6% of whom were male. The data collection was conducted in a standardised manner, through a questionnaire (paper-pencil format), which did not contain any sensitive information. The completion of the questionnaire by participants was voluntary and anonymous. The participants had the opportunity to withdraw from the study at any time without any need to provide a reason and there were no consequences. The data collection was made by opportunistic sampling based on the availability of potential participants in the vicinity of those who administered the questionnaires.

Statistical Processing

Data analysis was conducted using the IBM Statistical Package for Social Sciences (SPSS), version 28. Due to the non-normal distribution of the age data, a nonparametric Spearman correlation was used to determine the relationship between age and the evaluation of beauty through individual adjectives as well as between age and the three dimensions of semantic differential. The threshold for statistical significance was set at 95% (0.05).

RESULTS

Research Question 1

The correlations found between age and the adjectives used in the semantic differential to capture the concept of beauty (see Table 3) show that the evaluation of eleven out of twenty-one of the adjectives significantly correlates with the age of participants. Thus, age has a significant influence on the assessment of beauty for 52% of the adjectives in the semantic differential list.

Table 3. Mean values of adjectives describing beauty and their correlations with age (Spearman correlation) (part 1)

	Adjective	Adjective	Correlation with age	
	Beauty is:		Spearman's rho	sig.
Activity	Exciting	Soothing	0.093	< 0.001
	Aggressive	Moderate	0.017	0.425
	Erotic	Romantic	0.028	0.206
	Expressive	Inconspicuous	0.013	0.558
	Strict	Lenient	0.046	0.030
	Impulsive	Judicious	0.136	< 0.001
	Fast	Slow	-0.039	0.072

Source: Authors

Table 3. Mean values of adjectives describing beauty and their correlations with age (Spearman correlation) (part 2)

	Adjective	Adjective	Correlation with age	
	Beauty is:		Spearman's rho	sig.
Evaluation	Inviting	Repulsive	0.096	< 0.001
	Inspiring	Boring	0.101	< 0.001
	Kind	Hateful	-0.023	0.301
	Calm	Restless	-0.012	0.581
	Pure	Dirty	0.015	0.479
	Pleasant	Unpleasant	0.000	0.994
	Good	Bad	-0.032	0.148
Potency	Familiar	Strange	-0.041	0.061
	Simple	Complicated	-0.118	< 0.001
	Understandable	Unintelligible	-0.082	< 0.001
	Logical	Illogical	-0.110	< 0.001
	Knowable	Unknowable	-0.066	0.003
	Orderly	Chaotic	-0.091	< 0.001
	Balanced	Unbalanced	-0.098	< 0.001

Source: Authors

The majority of adjectives that correlated with age were found in the potency dimension; Table 4 shows a summary of the results of a Spearman's correlation of the individual dimensions of semantic differential and age. Besides potency, a statistically significant correlation was also found between age and the activity dimension.

Table 4. Dimensions of beauty (semantic differential) and their correlations with age (Spearman's correlation)

Dimensions	age	
	Spearman's rho	sig.
Activity	0.088	< 0.001
Evaluation	0.031	0.150
Potency	-0.143	< 0.001

Source: Authors

Research Question 2

Based on the values of rho from the Spearman's correlation, it can be stated that the assessment of beauty varies, depending on age, primarily in the adjective pairs: impulsive/judicious, simple/complicated, logical/illogical, inspiring/boring, and balanced/unbalanced. Figure 1 presents graphs that depict the development of the assessment of these adjectives across six age categories.

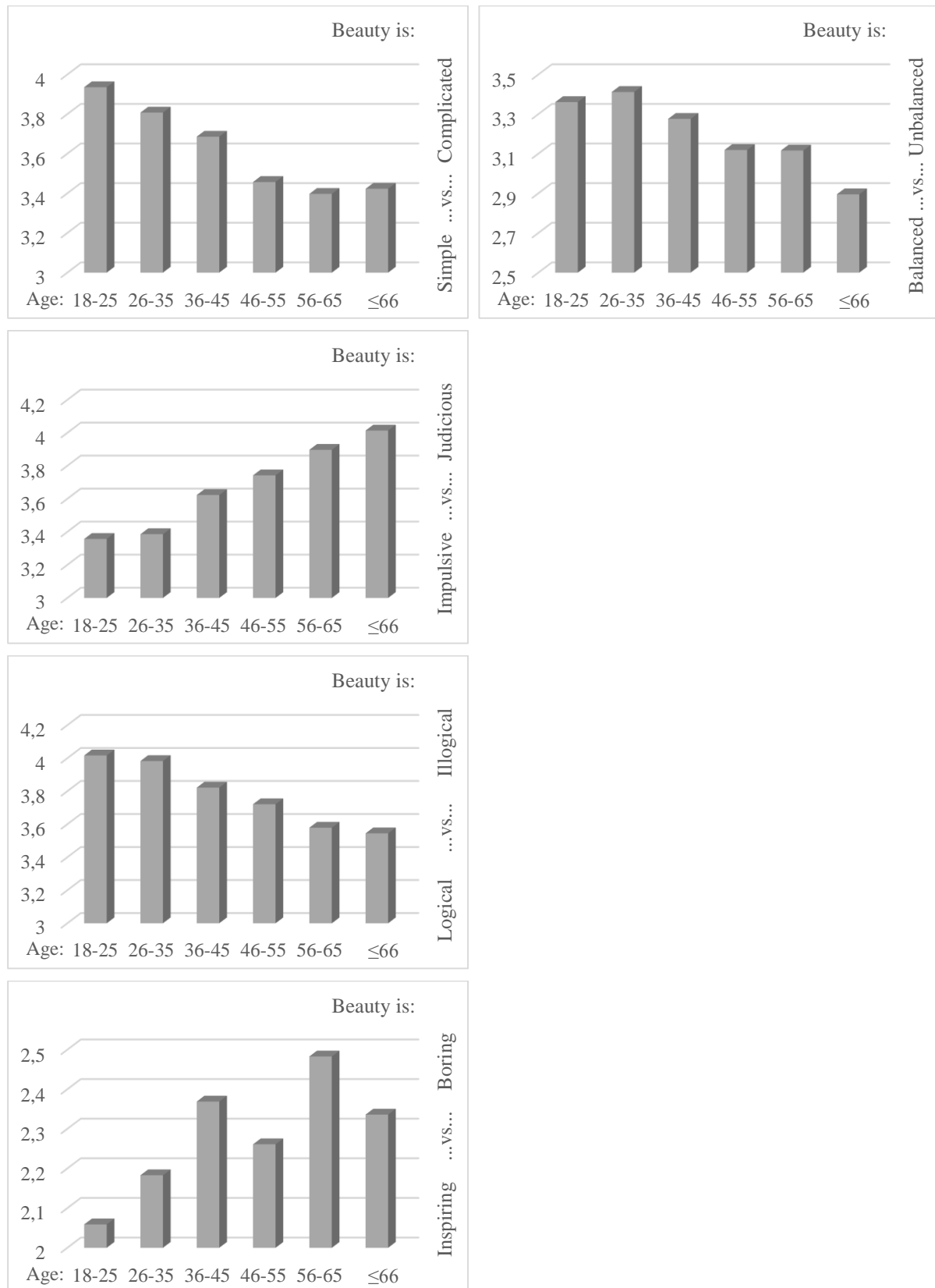


Figure 1. Graphical representation of the evaluation of selected bipolar adjective pairs in six age groups

From Figure 1 it can be seen that the older the participants, the more they perceive beauty to be simpler, more logical, balanced, judicious, and less inspiring. Additionally, within other statistically significant tendencies (see Table 3), it can also be noted that beauty is considered to be more soothing, lenient, repulsive, understandable, knowable, and orderly among the older age groups in comparison to the younger age groups.

DISCUSSION

The main intention of the research was to identify the possible influence of age on the assessment of the concept of beauty using the method of semantic differentials. Twenty-one bipolar adjectives were used to evaluate the concept of beauty, which were further grouped into the three classical dimensions (Osgood, 1957; Osgood et al., 1957) of activity, evaluation, and potency. Their suitability for evaluations of the concept of beauty has been validated by previous studies (see, for example, Demuthova & Demuth, 2023^A; 2023^B). The results highlighted eleven bipolar adjectives whose evaluation statistically significantly correlates with the age of the participants, indicating that certain aspects of the assessment of beauty are significantly influenced by age.

Analysis of the character of the adjectives whose evaluation changed with age showed that they were predominantly within the potency dimension (strength). The older the evaluator, the more they perceive beauty to be simpler, more understandable, logical, knowable, orderly, and balanced. From the content of these adjectives, it is evident that they relate to experiences and knowledge from many areas – the longer an individual encounters beauty and beautiful objects, the better they understand them, comprehend their logic (logical, orderly, balanced), and find them to be less complicated. Thus, it seems that in this context, the experience that an individual acquires with age significantly influences the content of the concept of beauty. These findings are difficult to compare with existing research – studies focused on an evaluation of the concept of beauty are rare; occasionally, there are papers regarding the influence of age on the assessment of facial beauty (e.g., Salehi et al., 2019; He et al., 2021). Some studies have shown a tendency for older participants to be more lenient when rating facial beauty, younger participants tend to be more critical in their evaluations of facial attractiveness (see, for example, Ebner et al., 2018; Kiiski et al., 2016). There are several studies that have examined the effect of experience on the assessment of beauty – for example, Ardizzi et al. (2023) found that even sensorimotor experience with a certain quality of an object leads to objects that possess that quality being evaluated as more beautiful. What is common, frequent, familiar, etc., is considered more beautiful (Demuthova et al., 2019). Thus, experience itself can be an important factor in the perception and evaluation of beauty.

It is evident, that there are differences between younger and older participants in the assessment of adjectives that describe the potency dimension of the concept of beauty. There are several possible explanations for this. The first group of explanations treat the differences as objective facts, assuming that these differences truly exist and would be demonstrable even in a real life evaluation of beautiful objects; thus, older participants indeed prefer beautiful objects that are simpler, more understandable, logical, knowable, orderly, and balanced. The second group of explanations leans towards the possibility that it is a rather subjective dimension that mainly understands the concept based on experience and knowledge, which become more abundant as age increases. In this case, it is not so much about objective differences in which objects are beautiful, but rather an awareness of the characteristics of beautiful objects, thus more about the recognition and understanding of what beauty is.

If we assume that the tendency of older people to evaluate the concept of beauty within the potency dimension as simpler, more understandable, logical, knowable, orderly, and balanced, in comparison to the younger age groups, reflects differences in preferences for beautiful objects, then there are several levels of interpretation open to us. The first can be found in Donald Symons' theory, it proposes that within cognitive processes, there is a so-called "averaging function" (Symons, 1979).

According to this concept, individuals organise and classify sensory information into categories (e.g., "houses," "cats," "cars," "faces," etc.). Cognitive averaging is a lifelong process where, based on individual examples within a certain category, a central representation of the category – a "prototype" – is created. An important consequence of this prototype formation is that humans find the prototype to be more attractive than any individual member of that category because the prototype, due to its familiarity, is easier (cognitively) to process (Pallet et al., 2010). Therefore, the prototypes are objects that are familiar, predictable, knowable; a perceiver understands their logic and order. Such prototypes are also preferred and considered to be more beautiful than individual exemplars in the categories of stimuli (Whitfield & Slatter, 1979; Martindale & Moore, 1988). The more experienced (older) an evaluator, the more the prototype reflects the average, and beautiful objects tend to be described as being simpler, more understandable, logical, knowable, orderly, and balanced.

Another possible explanation for the statistically significant correlation between age and adjectives within the potency dimension is that the concept of beauty may change with age as preferences change for objects that individuals consider beautiful. It is possible that older individuals mainly consider objects that are simple, understandable, logical, knowable, orderly, and balanced to be beautiful. These adjectives can be associated with stability, predictability, and a considerable degree of certainty. It is known that older individuals can better appreciate these characteristics – unlike younger individuals who prefer exciting and inspirational stimuli that better satisfy their higher degree of impulsiveness and the search for novelty (Chamorro et al., 2012). Individuals in middle and late adulthood (old age) are characterised by preferences for stability in various areas (Cornwell et al., 2021; MacCormack et al., 2021). Therefore, it is possible that the aforementioned results indicate changes in the understanding of the concept of beauty during ontogenesis. This assumption is supported by findings on the correlation between age and other adjectives that describe the understanding of the concept of beauty. The results of the Spearman's correlation indicate that younger participants perceive things that are exciting, impulsive, inviting, or inspiring to be beautiful, i.e., activating elements. This was confirmed by the correlation results – the activity dimension of the semantic differential correlated with age at a statistically significant level of 99% ($p < 0.001$).

Another perspective offers an interpretation focused more on the self-awareness of individuals rather than on objective differences that exist in the perception of beauty between younger and older participants. As they age, individuals not only gain information and experience of the surrounding world but also self-knowledge (Lodi-Smith & Roberts, 2010), including their preferences, what they like, and what they don't. Older people may therefore have a better understanding of which objects they typically prefer and why; they may better understand and predict their reactions to objects around them, have analysed their preferences (what they like) to a much greater extent, and also understand the reasons why they like some things more than others. As a result of such knowledge and experience, they may then evaluate beauty as simpler, more understandable, logical, knowable, orderly, and balanced. In this context, age acts as a variable that allows the better recognition and understanding of beautiful objects, which is subsequently reflected in the overall understanding of the concept of beauty.

The above explanations assume that the correlations between age and bipolar adjectives characterising the concept of beauty were caused by changing preferences or evolving awareness of beauty during ontogenesis. However, the results of the correlations do not only have to be interpreted as a result of maturation/aging. It is possible that different evaluations of adjectives related to beauty may be a consequence of the different conditions which led to the formation of perceptions of what is beautiful. The criteria and perspective of beauty change depending on the current socio-cultural preferences, strongly influenced by fashion trends and media intervention (see for example Anderson et al., 2022). In our recent history, periods can be identified when a more natural appearance was preferred (Meier et al., 2019), but there have also been periods characterised by numerous artificial interventions that were intended to enhance the characteristics of objects to make them beautiful

(Gottlieb, 2001); there have been periods that emphasised balance, peace, and harmony (de Leeuw, 2017), and periods when intense stimuli and excitement were preferred. It is therefore possible that the tendencies identified could have been influenced by these factors; however, since this intervening variable was not monitored, this interpretation would require further verification. Similarly, it might be beneficial to examine the influence of gender in the changes in understanding of the concept of beauty depending on age – it could be assumed that the influence of age on the concept of beauty differs between women and men. These and other stimuli could be an inspiration for further research in our understanding of the concept of beauty.

Acknowledgment

This work was supported by the Slovak Research and Development Agency under contract No. APVV-19-0166.

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**EXPLORING THE INFLUENCE OF TEACHER FAVORITISM IN A BENINESE
VOCATIONAL AND TECHNICAL SECONDARY SCHOOL'S CLASSROOMS**

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Abstract

Favoritism, also referenced as selective attention, can impact a learner's emotional, social and academic wellbeing. It is often observed in classrooms with teachers engaging in it through obvious and/or furtive activities. Often, such teachers seem actually unaware of this behaviour. In fact, classroom favoritism is attributable to a teacher's own background and determining how he/she relates to students. Favoritism can affect students for many years and possibly be liable for corrupting values, lowering student self-esteem, and exacerbating student's behavior problems. That is why this research aims to explore whether there is inadvertent selective attention in a Beninese vocational and technical secondary school: CFP Sè. The main research question was: do increased male students' interactions with the professor decrease the female students' interactions? Qualitative research tools such as interviews and class observations were observed. Results show that male students do benefit from more professor interaction during class time to the detriment of female students. However, it is unclear if—beyond teacher favoritism past student experiences—certain subjects, or class set up are in some way partially responsible for or exacerbate these findings. Therefore, teachers are encouraged to examine their behaviors to determine ways to counteract favoritism in the classroom.

Keywords: favoritism, selective attention, teachers and other actors, classroom management

HIV AND NUTRITION

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Abstract

HIV is an infectious virus that impairs the functions of the human immune system. When the immune system is compromised, microorganisms entering the body are more likely to cause diseases. It can be transmitted through various means such as blood transmission, from mother to baby through the placenta, or sexual contact, making it prevalent across different age groups. According to the 2022 data from the United Nations Programme on HIV/AIDS (UNAIDS), 39 million people worldwide have been diagnosed with HIV. Symptoms in HIV-positive individuals include nausea, enlarged lymph nodes, diarrhea, bone loss, and weight loss. Antiretroviral therapy, aimed at viral suppression, is employed in the treatment. This treatment helps maintain CD4 T lymphocyte cell counts, leading to improvement in immune functions, enhancement of quality of life, and an extension of life expectancy. Nutrition is crucial for addressing deficiencies in vitamins and minerals that may arise due to symptoms and the disease itself. Additionally, the effects of HIV medication and the virus on the body disrupt the lipid and glucose metabolism in HIV-positive individuals, resulting in the occurrence of other chronic diseases such as diabetes, metabolic syndrome, and dyslipidemia. Inadequate nutrition leads to clinical conditions like anemia, deficiencies in vitamins and minerals, and protein-energy malnutrition, while the virus and medications induce nausea and loss of appetite, contributing to inadequate nutrition. Studies suggest that micronutrients with antioxidant properties, such as Vitamins A, C, and E, strengthen the immune system, thereby improving the quality of life for HIV-positive individuals. Furthermore, research indicates that Vitamin D and calcium minerals support skeletal health in these individuals, particularly in cases of bone loss. Alcohol exacerbates the negative effects of HIV medication on bone marrow and the liver, accelerating the progression of the disease. Further research is needed on the relationship between HIV and nutrition.

Keywords: HIV, Nutrition, Vitamins, Minerals, Alcohol, Food Safety

**AT THE BEGINNING OF THE 20TH CENTURY, THE STRUGGLE OF THE QAJAR
STATE AND THE OTTOMAN EMPIRE FOR POLITICAL CONTROL OVER THE
SOUTH CAUCASUS**

**XX ƏSRİN ƏVVƏLLƏRİNDƏ QACARLAR DÖVLƏTİNİN VƏ OSMANLI
IMPERİYASININ CƏNUBİ QAFQAZA SIYASI NƏZARƏT UĞRUNDA MÜBARİZƏSİ**

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Açar sözlər: Osmanlı, Cənubi Qafqaz, Qacar, Azərbaycan

Dövlətdaxili siyasi hakimiyyətini möhkəmləndirməyə çalışan Fətəli Şah həmçinin Qafqaz bölgəsində də öz nüfuzunu gücləndirməyə çalışırdı. Bu arada Cənubi Azərbaycan xanlarından olan Xoy xanı Cəfərqulu xanın üsyanını yatırarkən İrəvan bölgəsinə də təhdid yaratmışdır. Bu ərazilərdə meydana gələn hadisələrlə bağlı olaraq 1800-cü ilin 3 oktyabr tarixində Qars qalasının mühafizə komandiri Numan Paşa tərəfindən osmanlı hökumətinə göndərilən hesabatda qeyd edilir ki, “Şah Azərbaycanda qayda-qanun yaratmaq üçün 20 minlik hərbi qüvvə ilə oğlu şahzadə Abbas Mirzəni Xoy xanı Cəfərqulu xanın üzərinə göndərmişdir. Abbas Mirzə Xoy xanını məğlub etdikdən sonra İrəvan üzərinə hücum edərək Məhəmməd xanı təzyiq altında saxlamışdır. Numan paşanın hadisələrə müdaxilə edərək məsələnin həlli üçün vasitəçi olmuşdur. Nəticədə Abbas Mirzə mühasirəni dayandıraraq Təbrizə geri dönmüşdür.

Qeyd edək ki, bu dövrdə Təbriz, Şirvan, Qarabağ bölgəsində kəşfiyyat fəaliyyətini davam etdirən Abbas Mirzənin komandanlığındakı hərbi birləşmələr Azərbaycanın şimal əyalətlərini ələ keçirmək və Gürcüstanda Qacar dövlətinin siyasi nüfuzunu bərpa etməyi düşünürdü. Qacar hakimiyyətinin Cənubi Qafqaza yönəlmiş bu siyasətini Osmanlı hökuməti ölkəsinin şərq əraziləri üçün ciddi təhlükə olaraq dəyərləndirirdi.

Osmanlı hakimiyyətinin Trabzon valisi Mahmud Təyyar Paşanın 1804-cü ilin iyun ayında paytaxta göndərdiyi bir məlumatda, “Abbas Mirzənin Qafqaz bölgəsində fəaliyyətinin gərginlik yaratdığını, gənc şahzadənin sadəcə İrəvanı deyil, Gürcüstan ərazilərini də ələ keçirmək niyyətində olduğunu” qeyd edirdi.

Belə bir mürəkkəb siyasi şəraitdə Osmanlı-Qacar münasibətlərini gərginləşdirən səbəblərdən biri də Qacar hakimiyyətinə üsyan etmiş Xoy xanı Cəfərqulu xanın osmanlı dövlətinə sığınması idi. Bu hadisə tərəflər arasında ciddi siyasi gərginlik yaratmış, Qacar hakimiyyəti Osmanlı dövlətinə göndərilən elçilər vasitəsilə Cəfərqulu xanın təslim edilməsini tələb etmişdir. Lakin bu cəhdlərə baxmayaraq Osmanlı dövləti onlara sığınan şəxsləri geri qaytarmamışdır.

Key words: Ottoman, South Caucasus, Qajar, Azerbaijan

Throughout history, the Caucasus, located in a favorable geographical position, has always been in the interest of both neighboring countries and big states located in other regions. The Ottoman state and the Qajar Shah had goals to strengthen themselves in the Caucasus. Fatali Shah, who tried to strengthen his domestic political power, also tried to strengthen his influence in the Caucasus region. Meanwhile, Khoi Khan, one of the khans of South Azerbaijan, posed a threat to the Iravan region

while suppressing Jafargulu Khan's rebellion. In connection with the events that took place in these areas, on October 3, 1800, the report sent to the Ottoman government by the guard commander of the Kars fortress, Numan Pasha, states that “Shah sent his son Prince Abbas Mirza to Khoi Khan Jafargulu Khan with a military force of 20,000 to establish order in Azerbaijan. After defeating Abbas Mirza Khoi Khan, he attacked Iravan and kept Muhammad Khan under pressure. Numan Pasha intervened in the events and became a mediator for solving the issue. As a result, Abbas Mirza stopped the siege and returned to Tabriz.

It should be noted that during this period, the military units under the command of Abbas Mirza, who continued intelligence activities in Tabriz, Shirvan, and Karabakh regions, were thinking of capturing the northern provinces of Azerbaijan and restoring the political influence of the Qajar state in Georgia. The Ottoman government assessed this policy of the Qajar government towards the South Caucasus as a serious threat to the eastern territories of its country.

In a report sent to the capital by Mahmud Tayyar Pasha, the governor of Trabzon, by the Ottoman authorities in June 1804, “noted that Abbas Mirza's activities in the Caucasus region created tension, and that the young prince intended to capture not only Yerevan, but also the territories of Georgia.

One of the reasons that strained the Ottoman-Qajar relations in such a complex political situation was the refuge of Khoi Khan Jafargulu Khan, who rebelled against the Qajar rule, in the Ottoman state. This incident created serious political tension between the parties, the Qajar authorities demanded the surrender of Jafargulu Khan through the envoys sent to the Ottoman state. However, despite these attempts, the Ottoman state did not return the people who took refuge in them.

England and France, one of the leading European countries, expressed their desire to become one of the power centers in the Caucasus region, and also looked for ways to realize these wishes. Because France and England had no border connection with this region, it was very difficult for them to implement a direct policy. Therefore, the only step of these states to weaken Russia's influence on the region and realize their strategic interests was to use the Ottoman and Qajar states.

XVIII əsrin sonu - XIX əsrin əvvəllərində Avropa və Yaxın Şərqdə baş verən siyasi hadisələr Qafqaz bölgəsi ilə bir başa bağlı idi. Böyük dövlətlərin Avrasiya məkanına nəzarət uğrunda apardığı ölüm-dirim savaşı, Qafqaz bölgəsi üçün də keçərlidir.

XVIII əsrin sonu – XIX əsrin başlanğıcında Avropada baş verən ictimai-siyasi hadisələrin təsiri nəinki Avropaya, həmçinin Şərq ölkələrinə də öz təsirini göstərirdi. Bu dövrdə Fransa, İngiltərə kimi ağılağa can atan dövlətlər dünyanı bölüşdürmək və geridə qalmış ölkələrin böyük və zəngin təbii ehtiyat mənbələrini ələ keçirmək üstündə rəqabət aparırdılar.

Məlumdur ki, Fransızların məqsədi Hindistanın böyük sərvətinə, xəzinəsinə sahib olmaq, İngiltərə üzərində qələbə çalmaq və beynəlxalq aləmdə Böyük Britaniyanın yerini tutmaq idi. Fransa istəyirdi ki, İngiltərə Hindistandan geri çəkilsin. Fransanın bu siyasəti onu istər-istəməz Qacarlar dövləti ilə yaxınlaşdırırdı. Qacarlar dövləti Hindistanın qonşusu və bu ölkəyə girmək üçün təbii bir yol idi. Digər bir tərəfdən isə Rusiyanın günü – gündən güclənməsi onun Şərq istiqamətində aktiv siyasət yürütməsinə imkan yaradırdı. Bu baxımdan İran – Rusiya müharibələri, İngiltərə və Fransanın İrana qarşı müttəfiqlik siyasətini gücləndirmək məcburiyyəti yaradırdı.

1800-cü ilin sonunda Ost – Hind şirkətinin Hindistan general-qubernatoru lord Uezli kapitan Con Malkomun başçılığı ilə diplomatik missiyanı Fətəli şahın yanına göndərdi. 1801-ci ilin yanvar ayının 4-də Malkom Qacar dövlətinin vəziri ilə apardığı danışıqlar nəticəsində bir siyasi, digəri ticarət olmaqla iki müqavilə imzalandı. Siyasi müqaviləyə görə Cənubi Qafqazda möhkəmlənmək üçün İngiltərənin Qacar dövlətinə yardım edəcəyi vəd olunurdu.

Türkiyə tarixşünaslığında İngilis-İran sazişi bu şəkildə öz ifadəsini tapmışdır: “XIX əsrin əvvəllərində İngiltərənin İran siyasəti fəallığı ilə seçilirdi. Çünki İngiltərənin bölgəyə siyasi

maraqlarla yanaşı İranın limanlarından ticarət məqsədləri də vacib faktorlardan idi. İngilis hökuməti 1800-cü ildə əfqanların Hindistana hücumlarının qarşısını almaq üçün general-qubernator Malkomu danışıqlar aparmaq üçün İrana göndərmişdir. 1801-ci ildə imzalanan sazişə görə, Əfqan hücumlarına qarşı birgə mübarizə aparmaq, həmçinin Əfqan hakimləri və fransızların İrana hücum edəcəyi halda İngiltərə hökumətinin İranı hərbi təchizatla təmin etmək, əgər fransız ordusu İran körfəzi sahillərində möhkəmlənməyə cəhd edərsə bu müdaxiləyə qarşı birgə mübarizə aparmaq nəzərdə tutulurdu.

1801-ci ildə Rusiyada hakimiyyət dəyişikliyi, dövlətin xarici siyasətində də dəyişikliyə səbəb oldu. Çar I Aleksandr (1801-1825) Fransa ilə yaxınlaşmaqdan imtina edib İngiltərə ilə müttəfiqliyə üstünlük verdi. 1804-cü ildə başlayan Rus-Qacar müharibəsində İngilislərin Rusiyanı müdafiə etməsi İngilis-İran müqaviləsinə təhlükə yaratdı.

1801-ci il sazişinə arxalanaraq 1804-cü ildə Rusiyaya müharibə edən Qacar hakimiyyəti bu müharibədə İngiltərədən hərbi kömək istəmişdi. Lakin İngilis hakimiyyəti hərbi kömək müqabilində bəzi şərtlər irəli sürmüşdür. Bu şərtlərə görə, İran bütün sahil ərazilərini və adaları boşaltmalı, Bəndər-Buşlurə bağlı ingilislərlə birgə hərəkət etməli, İngilis hərbi birliklərinin məsrəflərini qarşılmalı, İran hərbi birliklərinə komandanlığı İngilislərə həvalə etməli idi. Fətəli Şah bütün bu şərtləri rəddə etmiş, Napoleona bir məktub göndərərək müttəfiqlik təklif etmişdir.

İngiltərə və Rusiya arasında Fransaya qarşı birgə hərəkət barədə 1805-ci ilin 30 martında bağlanan müqavilə isə İngiltərənin Qacarlar dövləti ilə bağladığı siyasi müqavilənin kağız üzərində qalmasına səbəb olmuşdur.

Fətəli Şahın təklifinə cavab olaraq 1805-ci ilin mayında Napoleon öz emissarı Amadey Joberi Şərqi göndərir. Ona verilən təlimatda İran, Türkiyə və Azərbaycan ərazilərini öyrənmək, rus sərhədlərindəki vəziyyət haqqında məlumat toplamaq tapşırığı var idi. Digər bir fransa emissarı Romeyin Qacar Şahına təqdim etdiyi məktubda isə onlara Xəzər dənizində gəmilər inşa etməyə Fransanın yardımı təklif olunurdu.

Romeyin Tehtanda vəfat etdikdən sonra bu missiyanı fransız Joberi davam etdirmişdir. 1806-cı ilin iyun ayında Tehrana gələn Joberi Fransa hakimiyyətinin təkliflərini Şaha təqdim etmişdir. Bu təkliflər içərisində ən önəmlisi, Şahın İngiltərə ilə müttəfiqliyindən imtina edəcəyi təqdirdə Hindistanın müştərək ordu ilə fəth edilməsi və bunun müqabilində İranın Qafqazda itirdiyi torpaqların geri qaytarılmasına kömək ediləcəyi bildirilirdi. Danışıqlardan sonra fransız səfiri Parisə Şahın müsbət cavabı ilə dönmüş lakin Napoleon ittifaq bağlamağa tələsməyərək, Tehrana təkrar heyət göndərərək İranın mövcud vəziyyətini və Hindistanın istilasında İrandan gerçək kömək görüb görməyəcəyini öyrənmək istəmişdir.

Rus qoşunlarının 1806-cı ildə Bakını və Dərbəndi işğal etməsi Qacar Şahını Fransız hakimiyyəti ilə tezliklə ittifaq razılaşması əldə etməyə məcbur edirdi. Tilziddə Mirzə Rza xanla fransız nazir Mare tərəflər arasında müqavilə imzalandı. Bu müqavilə 1807-ci ilin may ayının 4 – də Finkensteyndə təsdiq olundu. Tərəflər arasında razılaşmaya görə, Napoleon İranın torpaq bütünlüyünə təminat verir, Gürcüstanı İranın bir parçası sayır, Rusiyanı Gürcüstandan və digər işğal olunmuş ərazilərdən çıxarmaq üçün nüfuzundan istifadə edəcəyini bildirir və İranın hərbi birliklərinin modernləşdirilməsinə və silahla təhciz olunmasını öhdəlik kimi üzərinə götürürdü. Həmçinin Napoleon Şahın istədiyi qədər ona silah-sursat verəcəyini vəd edərək, İrandan İngiltərə ilə siyasi və iqtisadi əlaqələri kəsməyi, hətta ingilislərə savaş açmağı istəyirdi.

XIX əsrin əvvəllərində İngiltərə və Fransa kimi böyük dövlətlərin Osmanlı dövləti ilə siyasi münasibətləri Cənubi Qafqaz məsələsində olduqca əhəmiyyətli faktorlardan biri idi. 1805-ci ilin mart ayından etibarən İngilis – Rusiya ittifaqı Osmanlı, Qacar və Fransa dövlətləri arasında diplomatik əlaqələrin intensivliyini artırır. Osmanlı və Qacar dövlətlərinin Rusiya ilə düşmənçilik siyasəti, Fransanın bu vəziyyətdən məharətlə istifadə etməsinə imkan yaradırdı.

1798-ci ildə Napoleonun Misiri işğal etməsi Osmanlı-Fransa münasibətlərinə ciddi ziyan vurmuşdur. Lakin 1801-ci ildə tərəflər arasında əldə olunan razılaşmaya əsasən fransızlar Misiri tərk etmişdir. Fransa ilə münasibətləri möhkəmləndirmək məqsədilə III Səlim 1802-ci ildə elçisi Qalib Əfəndini Fransaya göndərmişdir.

Tarixçi Cevat Eren qeyd edir ki, “Bu dövrdə Avropada baş verən hadisələri yaxından izləyən Osmanlı hökuməti Fransanın İngiltərə ilə mücadiləsində tərəfsiz qalmışdır. 1804-cü il ildə Napoleonun Fransada imperator elan edilməsi ilə İngiltərə, Rusiya, və Avstriya ittifaqı Fransaya qarşı müharibəyə başlamış və Osmanlı Sultanını da bu ittifaqa dəvət etmişlər. Lakin III Səlim bu ittifaq daxil olmamış, həmçinin hər üç dövlətlə balanslaşmış siyasət yürütmüşdür.

Fransanın Avropada rəqibləri üzərində qazandığı qələbələr yenidən Osmanlı hakimiyyətini Napoleonla yaxınlaşmaya sövq etmişdir. İstanbulda olan fransa nümayəndəsi Rofin Fransa imperyasının Osmanlı dövləti tərəfindən tanınmasının osmanlının xeyrinə olacağını bildirmişdir. O, qeyd etmişdir ki, Napoleonun Rusiya ilə əldə edəcəyi razılaşmada Osmanlı hakimiyyətinin maraqlarını da ifadə edəcəkdir. Qara dəniz bölgəsində və Qafqada Rusiya ilə ciddi problemləri olan Osmanlı hökuməti, bu problemlərin həllində Fransa hakimiyyətinin köməyinə ümid edərək, 1806-cı ilin mart ayının 30-da öz elçisi Mühib Əfəndini Parisə göndərmişdir.

Avropanın aparıcı dövlətlərindən olan İngiltərə və Fransa Qafqaz bölgəsində güc mərkəzlərindən biri olmaq istəyini ortaya qoyur, həmçinin bu istəklərini həyata keçirməyin yollarını da arayırdılar. Çünki Fransa və İngiltərənin bu bölgə ilə sərhəd əlaqəsi olmadığı üçün birbaşa siyasət həyata keçirmələri olduqca çətin idi. Buna görə də bu dövlətlərin bölgə üzərində Rusiyanın təsirini zəiflətmək və öz strateji maraqlarını həyata keçirmək üçün yeganə addımı Osmanlı və Qacarlar dövlətindən istifadə etmək idi.

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INVESTMENT FUNDS IN ALBANIA, A FRAGILE FINANCIAL PRODUCT

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Abstract

In Albania, Investment Funds as a financial product, have a lifespan of almost twelve years, during which they have seen growth and consolidation. However, 2022 was the most difficult year in their short lifespan, due to the rapid increase in interest rates and yields in the albanian financial market, as a result of high inflation, driven by increased uncertainty in the financial environment in the whole world because of the Russian-Ukraine war. This increase caused negative effects, over eleven thousand members left and the value of assets almost halved. It made even more tangible the problem of very limited investment alternatives for funds in albanian lek. The assets of the funds are invested to the overwhelming extent, in bonds of the albanian government. At the moment when the yields in the primary market started to grow strongly, the assets of the funds, measured by market value, suffered a sharp decline. However, even funds in foreign currency that have a wider spectrum of investments suffered a negative result.

The normalization of monetary policy has brought short-term negative effects for investment funds in Albania, but in a long-term horizon, it should be considered by investors as an opportunity to improve the returns of funds. Based on data from management companies, most funds have returned to positive territory in terms of annual return on investment.

The development of the capital market and a functional stock exchange are key factors for the future of Investment Funds in Albania. Introducing new instruments in the market, such as bonds issued by local governments, public enterprises and local corporations, would increase the range of investments, making the funds in albanian lek more diversified.

Keywords: government bonds, interest rates, investment funds, monetary policy.

INTRODUCTION

Like all over the world, banking investment in Albania, is considered an activity in the field of investments. An investment bank, is usually a private company that provides various financial and other services to individuals, corporations and institutions, such as creating financial capital by acting as the client's agent in issuing securities (corporate bonds). In order to establish a banking investment, it must first be created as a legal entity or a special joint of assets of several individual investors.

The widespread and functional forms in Albania are:

- a) Investment Fund, which is an activity with open participation, created on the basis of a contract through the public offer of quotas, and

- b) Investment Company, which is an activity with closed participation, established as a joint-stock company, based on the framework legislation in Albania, which can be with a public offer or a private offer and whose only commercial action is to carry out investments.

More widespread in the reality of recent years is the practice of the Investment Fund. The fund starts functioning, after it is registered at the National Center of Business, in the legal form as mentioned above and after the application to the Financial Supervisory Authority (FSA). In order for the fund, to be considered as part of the market, the approval decision from the Board of the FSA for the opening of it, must be taken. The fund is usually created for an indefinite period.

Investment Funds in Albania, are a cumulation of financial assets or money, which are managed by a company licensed by the Financial Supervisory Authority, with the primary objective of investing this money to produce profit for investors. All this money cumulated, forms the assets of the fund, which are then invested in financial markets at home or abroad, in bonds and other financial instruments.

Quotas in the Fund are generally issued in albanian lek. The fund decides that the purchase and redemption of shares can be carried out in another currency, after prior approval by the Financial Supervisory Authority.

Investment Funds represent an investment alternative to term deposits, and they aim to produce a higher return through a portfolio of instruments. Each fund invests in accordance with its investment objective, which is stated in the fund's prospectus. For example, The Prestige Fund (administered by Credins Bank) was created for investors who have savings in albanian lek and invests in treasury bills and bonds of the albanian government in the local market. By combining instruments with different maturities, the fund aims to provide higher returns than term deposits. While Raiffeisen Invest Euro, (administered by Raiffeisen Bank), is created for investors who have savings in euros and invests in bonds issued in euros, both in the local market by the albanian government, and in the european markets, issued by the largest european governments and corporations.

Every individual or institution has the opportunity to invest their money in an Investment Fund. Usually enter the fund, those investors who dare a rate of return of money higher than that of bank deposits. Investors choose the fund that fits their tolerance for financial risk. Investors in the fund are exposed to the risk that the assets in the fund carry.

Investment Fund is not considered a bank deposit, and as such is not insured by the National Deposit Insurance Agency.

DISCUSSION

The first Investment Fund in Albania, Raiffeisen Prestige, was established in March 2012 and currently manages about 310 million euros of assets. During these 12 years in the market, the number of funds, management companies and members have been gradually increasing. Currently, operate fourteen Investment Funds in the market, two alternative Investment Funds (recently introduced to the market), all of them administered by six companies.

The Investment Fund is one of the forms of collective investment enterprises, with open participation, created on the basis of a contract, through the public offer of quotas. Some of its advantages are:

- A low risk profile, as it is invested mainly in albanian state bonds;
- High liquidity: the possibility of withdrawal at any time within 7 days;
- Periodic investment or immediate sums;
- Professional investment management and diversification opportunities;
- 24/7 online fund account access.

Investment Funds in albanian lek, have concentrated their investments especially in treasury bills and bonds of the albanian government and to a lesser extent in liquid assets (bank account). Funds in foreign currency have a wider spectrum of investments, but even there, the financial instruments of debt of governments and commercial companies dominate in volume. Some of the funds are also engaged in investments in shares, but their specific weight in the market remains low.

The market is dominated by local currency (albanian lek) funds, which account for more than 91% of the funds' net asset value. In the last two years, the value of funds in foreign currency has also been negatively affected by the effect of the exchange rate (devaluation of the euro). For Investment Funds, the market risk, which comes mainly from interest rate fluctuations, constitutes the main activity risk, together with the liquidity risk. Fund assets are invested in financial instruments, the price of which may change daily. In the structure of their investments, about 80% of the total, belongs to treasury bills and government bonds.

Interest rate movements are inversely related to the value of these securities. In the case of an increase in interest rates, a revaluation of the portfolio of securities held by Investment Funds, would result in a decrease in the value of this portfolio and vice versa. Very important in this case is the duration of investments, understanding that the longer it is, the more sensitive the value of the fund is, as a result of movements in the interest rate.

Among the funds, the largest by a significant margin, remains Raiffeisen Prestige, which operates in albanian lek, with 62% of the market's net assets. Next comes the company's other fund in albanian lek, Raiffeisen Vision, with almost 17% of the net asset value.

Among foreign currency funds, the largest is Raiffeisen Invest Euro, with approximately 7% of the net value of assets. Raiffeisen Invest is the oldest actor in the market of investment funds, but its dominance in the market, is largely determined by the strategic decision of the parent company, Raiffeisen Bank Albania, to deliberately lead a large part of deposits of clients in investment funds. This shift originated roughly a decade ago, when the viennese banking group ordered its albanian subsidiary, to limit exposures to the albanian government. In these conditions, Raiffeisen Bank found the solution, setting up investment funds and encouraging a large part of its customers to move money from deposits to quotas in these funds. Other funds together make up approximately 14% of the total value of net assets.

The year 2022 was, undoubtedly, the most delicate for Investment Funds in Albania, in their short lifespan of approximately a decade.

The rapid increase in interest rates by Central Banks, had a negative effect on the existing investment portfolio of these funds, reducing returns and share prices. This negatively affected the net asset value and subsequently prompted some investors to liquidate the quotas and withdraw from the Investment Funds.

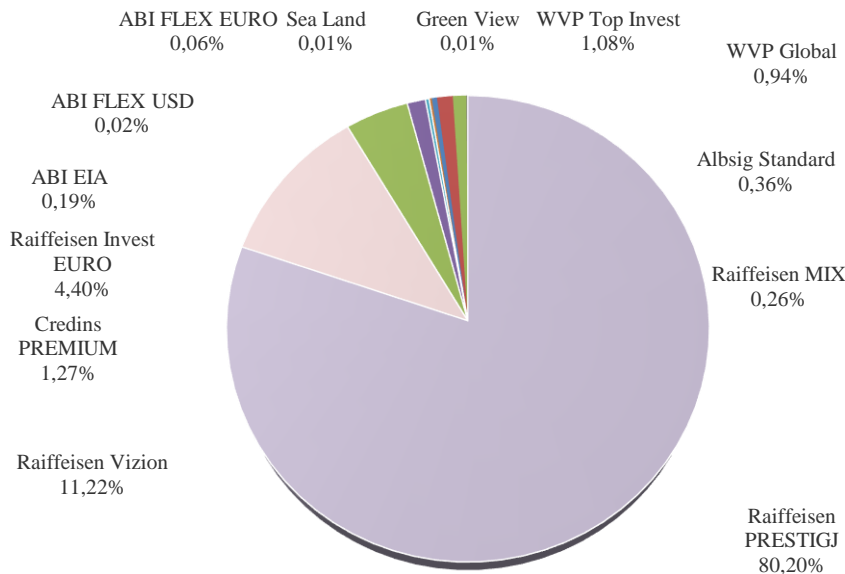


Figure 1. IFs' members (in %) 31.12.2023

Source: Financial Supervisory Authority Albania

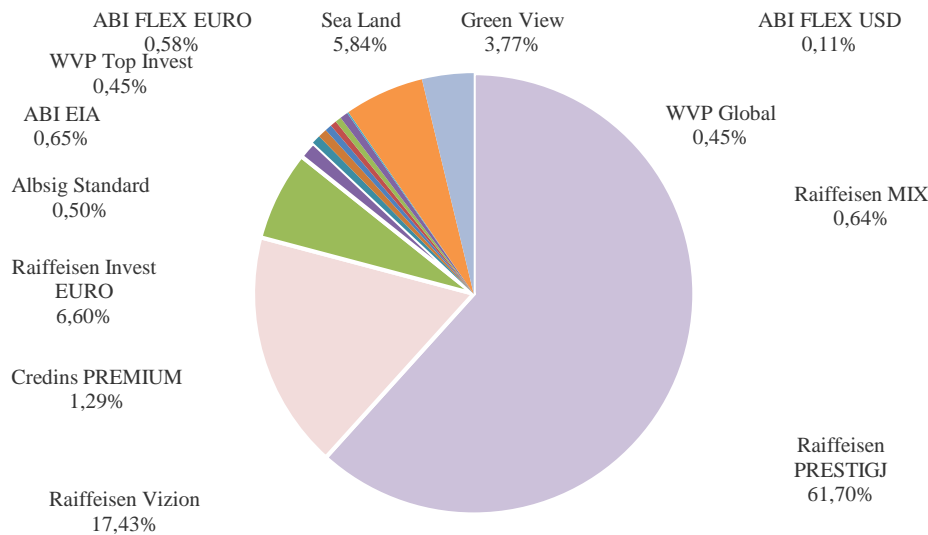


Figure 2. Net assets by IFs (%) 31.12.2023

Source: Financial Supervisory Authority Albania

In this new financial landscape, due to the inverse relationship between the interest rate and the price of a security (when the interest rates increase, the prices decrease and vice versa) and the way of evaluating the assets of the Investment Funds (the assets are held in the portfolio with the market value and this revaluation is done on a daily basis), Investment Funds had a decline in performance, which was followed by increased withdrawals from investors. In total, the Investment Funds market, shrank by around 43.8% in terms of net assets, losing 27.7% of its investors. In monetary value, it is calculated that during 2022, Investment Funds lost almost 34

billion albanian lek, or almost 300 million euros of assets. The negative effects of the rapid interest rates growth, were also clearly seen in the shrinking number of members, which fell to less than 29,000, almost 28% less compared to 2021. In one year, more than eleven thousand albanians chose to exit Investment Funds. This was due to the fall of rate of returns to negative values, but especially as a result of the lure from the strong increase in yields in the primary market of treasury bills and bonds of the albanian government. FSA data show that for 2022, purchases by individuals in the primary market of treasury bills and bonds reached 49.6 billion albanian lek, with a record increase of 216% compared to the previous year. This increase was a direct result of rapid increase of interest rates by the Central Bank of Albania. This led to a rapid depreciation of the assets of investment funds, consisting mostly of debt securities.

According to the law, fund members, have the right to withdraw at any time from the investment and the management company must return to them the money, within seven days. Usually this can be done without any penalty, but special funds may also provide for the payment of a penalty, for withdrawals up to a certain deadline, as is the case of Raiffeisen Vision. The ideal moment to exit the investment, is not when returns are falling, but it seems, has had a strong psychological effect on a large part of investors. According to managers of Investment Funds, albanian investors are very sensitive to the decline in investment returns.

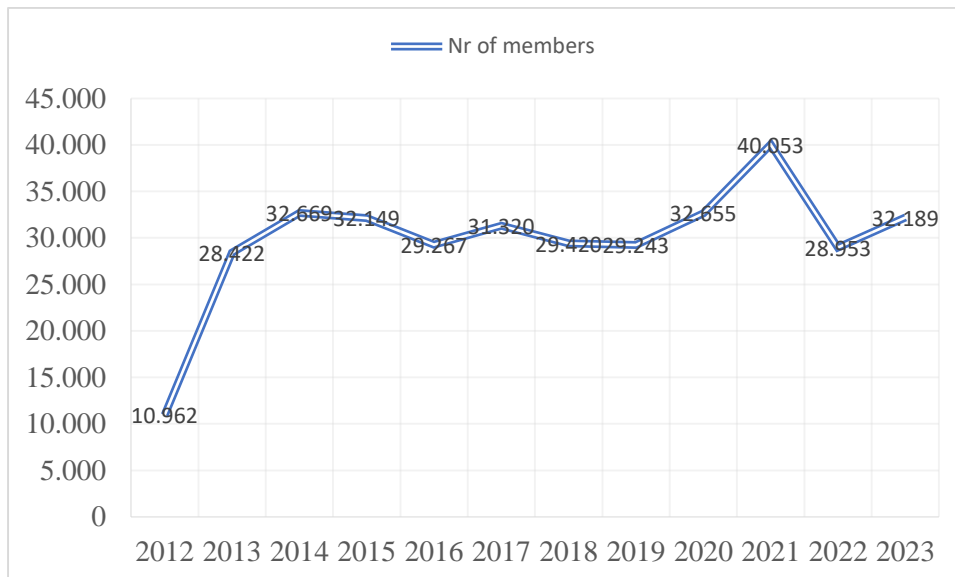


Figure 3: Progress of the number of members of IFs during the years

Source: Financial Supervisory Authority Albania, Author's calculation

The largest Investment Fund in albanian lek, Raiffeisen Prestige, in 2022, suffered a drop in return to -4.07%, from 2.43% the year before. Raiffeisen Invest's other Albanian lek fund, Raiffeisen Vision, also took a hit and the annual return fell to -8.82%, from 4.43% a year ago. The third fund, Credins Premium, fell to -6.77%, from 4.92% a year ago. Foreign currency Investments Funds also took an even deeper dive into negative territory.

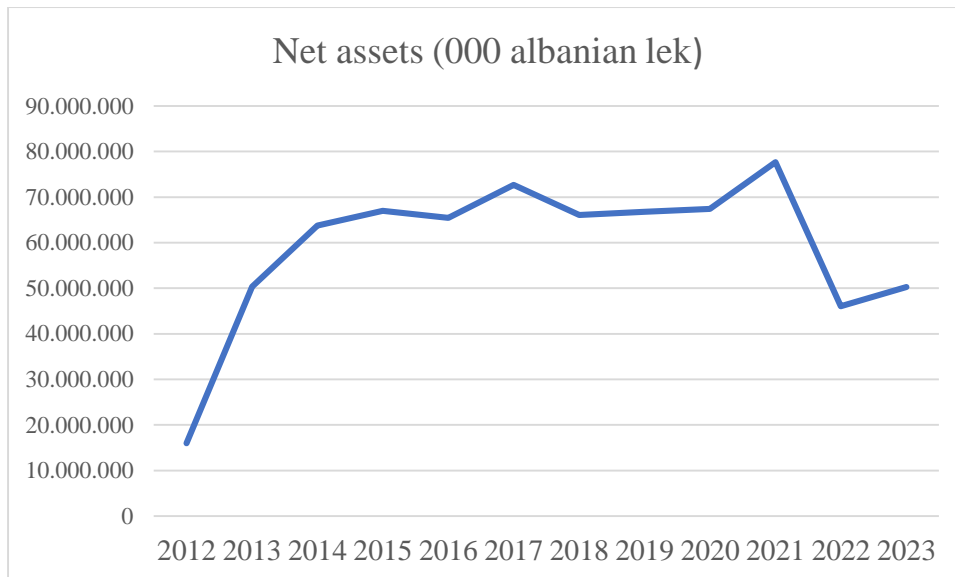


Figure 4: Performance of total net assets of IFs over the years

Source: Financial Supervisory Authority Albania, Author's calculation

To partially attenuate the strong shock that Investment Funds suffered from rising yields, management companies asked the Financial Supervisory Authority, to allow a change in the way funds' assets are accounted for.

More specifically, the companies requested that up to 30% of the investment funds' assets, should not be accounted for at fair value, but be classified as held-to-maturity, provided that they were invested in short-term financial instruments. However, the FSA rejected such a proposal, because the application of such a standard, even partially, would interfere with the liquidity feature of Investment Funds.

The year 2022 was not very good for Investment Funds in financial instruments, but it has brought positive developments for alternative Investment Funds. At the end of 2022, the total assets of alternative Investment Funds reached about 4.7 billion albanian lek, increasing by 10.6% compared to the previous year. Currently, two alternative Investment Funds are licensed in Albania, Sea Land Investment Fund and Green View Alternative Investment Fund. Both funds are managed by the management company, Credins Invest. The assets of these Funds are mainly invested in real estate and the increase in the value of these properties has had a positive effect on the total assets of these Funds. At Alternative Investment Funds, only professional and qualified investors can invest. These Funds create opportunities for further diversification of the financial market in Albania and provide more alternatives for professional investors.

According to the type of funds, even for 2023, the market of Investment Funds was dominated by Investment Funds in financial instruments, which owned about 90% of the total value of market assets, while Alternative Investment Funds owned about 10% of total assets. However, Alternative Investment Funds have increased their market share since their first opening at 2021, increase sustained from the appreciation of the value of their assets, but especially from the significant drop in the value of the assets of classic investment funds, in financial instruments.

The negative year for Investment Funds brought a decrease in the profits of management companies, but most of them nevertheless, managed to maintain a positive financial result for

2022. The decrease in profits came mainly from the decrease in income from the administration of funds.

During 2023, slowly but surely, the total of assets and the number of members of Investment Funds increased, despite the fact that these figures are far from the peak of 2021. The normalization of monetary policy has brought short-term negative effects for investment funds, but in a long-term horizon, it should be considered by investors as an opportunity to improve fund returns. Based on data from management companies, most funds have returned to positive territory in terms of annual return on investment.

CONCLUSIONS

In 2022, the financial environment all over the world was characterized by increased uncertainty, due to the war between Russia and Ukraine and extremely high inflation, which rose to historic levels. Central banks were forced to tighten monetary policy, aggressively raising interest rates to the detriment of economic growth. Also in Albania, during 2022 the Central Bank issued five interest rates growth, with a total increase of 2.25%. During 2023, the Bank of Albania has adopted a soft approach to interest rates. The base rate, so far, has only been raised twice, by 0.25 % each, capturing a level of 3.25%. It was more than obvious, that no one was prepared to face such a financial crisis, neither the public, nor the financial institutions, nor the regulators. This applies to all world financial markets, as well as to the fragile albanian financial market.

The strengthening of the albanian lek, has been one of the main factors of restraining the further increase of the base interest rate, in the conditions when the indicators of the labor market have been sustainable and that the internal inflation is showing to be more stable.

On the other hand, what is happening in Albania is a massive participation of individuals in the auctions of treasury bills and bonds of the albanian government, where due to the mechanism of organizing these auctions, bond rates are decreasing almost as much as they were raised in 2022.

The situation of 2022, made even more tangible the problem of very limited investment alternatives for funds in albanian lek. The assets of the funds, are invested to the overwhelming extent, in treasury bills and bonds of the albanian government. At the moment when the yields in the primary market started to grow strongly, the assets of the funds, measured by market value, suffered a sharp decline, because the increase in the interest rates of securities has a negative effect on the price of instruments/securities held in the portfolios of Investment Funds. This caused the Investment Funds to generate significant losses, which immediately brought the dissatisfaction of the investors, increased their uncertainty, causing the general behavior of withdrawal from funds.

A low tolerance of the albanian investor towards the volatility of the quota price has been noticed, which can be related to the negative experiences of the albanian society in the first years of the transition during the early 90's, but also to the level of financial education, where despite the obvious progress, much remains to be done by both market players and regulatory authorities. Also, the short lifespan of Investments Funds, is a factor that contributed to this behavior of the albanian investor.

The development of the capital market and a functional stock exchange are key factors for the future of Investment Funds in Albania. The actual valuation model, does not accurately reflect prices in real time. The Stock Exchange, would ensure at least real prices based on concrete transactions for a good part of the securities. Introducing new instruments in the market, such

as bonds issued by local governments, public enterprises and local corporations, would increase the range of investments, making the funds in albanian lek more diversified.

According to the analysts, Investment Funds are an important factor of the future of the financial market in Albania. They will be further developed to respond to the growing demands of the public, for more elasticity and profitability. Given the actual trend, why not, the time has come for the albanian investor to have access to investments with a focus on environmental protection.

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**PRESERVICE ENGLISH TEACHERS' SELF-EFFICACY BELIEFS TOWARDS
ENGLISH**

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Abstract

This study examines the self-efficacy of preservice English teachers towards English. The study, which used a mixed-methods approach, involves gathering quantitative and qualitative data sequentially. One hundred and sixteen preservice teachers were enrolled in the English Language Teaching (ELT) Department of the Education Faculty, who participated in the quantitative part of the study were selected with the convenience sampling, and English preservice teachers participated in the qualitative part of the study were participants who were determined as a voluntary. A Likert-type Self-Efficacy Scale for English was used as a quantitative data collection tool, and qualitative data was collected using a semi-structured interview form. The quantitative findings show no significant difference between preservice English teachers' self-efficacy beliefs in terms of gender, GPA, high school background, taking prep school, and self-efficacy beliefs of the preservice teachers. However, the study's qualitative findings show that exposure to English, participating in speaking activities, and interacting with international students contribute significantly to their self-efficacy beliefs toward English. This study investigates the importance of preservice teachers' self-efficacy beliefs and educational background. Further studies should be conducted to examine what can increase preservice teachers' self-efficacy beliefs and their success in the English language.

Key Words: English Language Teaching, Mixed Method Research, Preservice English Teachers, Self-Efficacy

**KOSOVO AND ITS PATH TOWARDS FULFILLING INTERNATIONAL STANDARDS
ON HUMAN RIGHTS – LGBTI COMMUNITY**

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Abstract

Kosovo is one of the newest country in the world and as such, it has had a lot of work to do in fulfilling the international standards on respecting human rights. As such also the Constitution of Kosovo is one of the guarantor of respect of such rights, including the LGBTI. But does that happen in practice, and how that is happening, having in mind that Kosovo is one of the countries with a society that has a lot of prejudices against this community. Putting that in front, there is a lot of work that has been done to fulfill the criteria of EU through Acqui, in order to fulfill the human rights protection, still there is a lack of evidence in practice that these laws do protect in the same line as other rights also the LGBTI community rights in Kosovo, which shows another reality in practice. It is very important for Kosovo society to change also the perception towards this community, and through that to make it possible and also understandable that LGBTI community in Kosovo is not just something, which was imported by “*Internationals*”, but that community is fighting for their fundamental rights. Whether Kosovo have done enough and what it will have to do, we will try to bring through this paper, which of course will not solve all the issues of LGBTI community in Kosovo, but will bring another perspective that Kosovo society has to do, in order to make these people not to live a double life in the society, but live their life as they are and not to be afraid from any persecution or discrimination. There will be a survey done in Kosovo, and also the results will be described in this paper, trying to show also the culture of Kosovo society towards LGBTI community. The paper will be finished with the conclusion about what we have found and also will bring the recommendations for future use, in support of the LGBTI community in Kosovo.

Keywords: Kosovo, LGBTI, Constitution, Acqui, Human Rights, Persecution, Discrimination,

LYME BORRELIOSIS OF PET DOGS IN BELGRADE AREA IN PERIOD 2019-2020

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Abstract

Lyme borreliosis is caused by infection with bacteria belonging to the *Borrelia burgdorferi* sensu lato species complex. Borreliosis is transmitted by ticks of the *Ixodes* genus. Ticks become infected with spirochetes on having a blood meal from a *Borrelia*-carrying host. In dogs, the most common clinical signs are intermittent, shifting lameness, fever, anorexia, lethargy, and lymphadenopathy with or without swollen, painful joints. Additionally, a renal syndrome has been attributed to *B burgdorferi* infection in dogs, though a causal relationship has yet to be established. This renal syndrome is characterized by uremia, hyperphosphatemia, and severe protein-losing nephropathy, often accompanied by peripheral edema. It is thought to be immune-mediated, and dogs typically present with either acute or chronic kidney failure, with or without additional cardiac or neurologic signs (eg, blindness, hypertension, heart murmurs, thromboembolic events). Most seropositive dogs are asymptomatic. The first cases of Lyme borreliosis in dogs in Serbia were recorded in 2011. During this examination in Belgrade area Lyme borreliosis was established in 1.33% of examined dogs. In our work, we present the results of research on Lyme borreliosis s in the Belgrade area in the period 2019-2020. We examined 356 blood samples of pets dogs from Belgrade area. Examinations were carried out in veterinary clinics where the dogs were suspected of having the disease based on the clinical picture and information about tick bites or the presence of ticks on them. Diagnosis is based on a combination of history, clinical signs, laboratory findings, exclusion of other diseases, and response to treatment. Blood samples were examined by the IDEXX 4Dx Plus Test. Lyme borreliosis was found in 1.56% of examined dogs. Clinical symptoms of the disease we occurred in les then 0.3% of positive animals. The most common clinical signs include fever and arthritis syndrome.

Keywords: dogs, Lyme borreliosis, Belgrade

**FROM SCRIPTS TO SYMPTOMS: ANALYZING ALZHEIMER'S DISEASE IN
INDIAN CINEMA**

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Abstract

Alzheimer's Disease (AD) is a progressive neurodegenerative disorder marked by cognitive decline and memory loss. Its global prevalence presents a significant public health challenge, impacting individuals, families, and healthcare systems. As populations age, the burden of AD is expected to grow, necessitating comprehensive approaches to improve detection, treatment, and support services for affected individuals and their caregivers. Within the rich tapestry of Indian cinema, which often mirrors societal norms and experiences, Alzheimer's is frequently depicted, offering a poignant exploration of human existence and the complexities of illness. However, despite its prevalence in India, scholarly research on how Indian films portray Alzheimer's remains notably sparse. This study seeks to bridge this gap by employing interdisciplinary approaches from medical humanities, cultural studies, and film theory to scrutinize the representation of Alzheimer's in Indian cinema. Through an analysis of narrative strategies, visual motifs, and socio-cultural contexts, the research aims to uncover the nuances and implications embedded within cinematic depictions of this neurodegenerative disorder. Central to the investigation is a critical evaluation of the accuracy, sensitivity, and impact of these representations. By delving into how Alzheimer's is portrayed on screen, the study not only enriches medical humanities scholarship but also enhances public comprehension of the disease. Looking ahead, the research extends its scope to include comparative analyses with global cinematic portrayals of Alzheimer's, exploring potential therapeutic and educational applications, and conducting longitudinal studies to track evolving trends in its depiction. Ultimately, these efforts strive to foster greater empathy, understanding, and dialogue surrounding Alzheimer's within the Indian context, contributing to the collective effort to address this pressing public health issue.

Key Words: Alzheimer's Disease, Indian Cinema, Medical Humanities, Cultural Studies

**AMERİKA BİRLEŞİK DEVLETLERİNDE BORSASINDA İŞLEM GÖREN
DOWJONES30 ENDEKSİNDE YER ALAN ŞİRKETLERİN FİNANSAL
BAŞARISIZLIKLARIN ÖLÇÜLMESİ**

**MEASURING FINANCIAL FAILURES OF COMPANIES INCLUDED IN THE
DOWJONES30 INDEX TRADED ON THE UNITED STATES EXCHANGE**

Erblin Xhoka

Finance, Universiteti I Tiranes ,Tirane ,Albania

Elda Hidri

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ÖZET

Dünya ekonomisine yön veren ülkelerin başında gelen Amerika Birleşik Devletleri başta olmak üzere dünya pandemi (COVID-19) ile ekonomik olarak daralmıştır. Bu daralma ve ekonomik kriz ile firmaların finansal sorunları ortaya çıkmıştır. Dünyadaki büyük global şirketleri finansal açıdan sorunlar ile karşı karşıya kalmıştır. Global firmaların finansal açıdan sıkıntıya girmesi, nakit akışlarının bozulması, tedarik zincirlerinde problemlerin ortaya çıkması, ekonomik ve pandemi nedeniyle finansal bazı sorunlar ortaya çıkmıştır. Global şirketlerin bozulan finansal tabloları finansal piyasalar için sorunlar doğurmuştur. Bu sorunlar firmaların finansal başarısızlıklarında önemli bir paya sahiptir. Finansal başarısızlıklarını ölçen ve bu doğrultuda önlemler alan şirketler bu tür olumsuzlukları daha kolay aştığı görülmektedir. Firmaların finansal başarısızlık riskini ölçmek için kullanılan yöntemler vardır. Bu çalışmada; Amerika Birleşik Devletlerinde işlem gören DOW JONES30 endeksinde (Dow Jones Industrial Average) DJIA işlem gören firmaların, mali performanslarının, finansal analiz yöntemleri Fulmer H skor modeli, Ohlson Skor modeli, Altman Z Skor modeli, Springate S Skor modeli ile analizleri yapılmıştır. Çalışmada şirketlerin 2001-2021 yıllarındaki bilanço ve gelir tablolarındaki verilerin Fulmer H skor modeli, Ohlson Skor modeli, Altman Z Skor modeli ve Springate S Skor modelleri kullanılarak iflas ve başarısızlık olasılıkları belirlenmeye çalışılmıştır. Şirketlerin Fulmer H skor modeli, Ohlson Skor modeli, Altman Z Skor modeli ve Springate S Skor modeli değerleri karşılaştırmalı olarak, finansal başarısızlık olasılığının sayısal değerlerini ve şirketlerin olumlu, belirsiz ve riskli alanda olması yorumlamalarını içermektedir.

Anahtar Kelimeler: Finansal Başarısızlık, DOWJONES30, DJIA, Altman Z-Skor Modeli, Springate Skor Modeli, Fulmer Skor Modeli, Ohlson Skor Modeli **Jel Kodu:** G01, G10, G15, G32

ABSTRACT

The world has shrunk economically with the pandemic (COVID-19), especially the United States of America, which is one of the leading countries in the world economy. With this contraction and economic crisis, the financial problems of the companies have emerged. Large global companies in the world have faced financial problems. Some financial problems have emerged due to the financial difficulties of global companies, the deterioration of cash flows, the emergence of problems in

supply chains, and the economic and pandemic. The deteriorating financial statements of global companies have created problems for financial markets. These problems have a significant share in the financial failures of companies. It is seen that companies that measure their financial failures and take measures in this direction overcome such negativities more easily. There are methods used to measure the financial failure risk of companies. In this study; Financial performances of companies traded in DJIA in the DOW JONES30 index (Dow Jones Industrial Average) traded in the United States were analyzed using the financial analysis methods Fulmer H score model, Ohlson Score model, Altman Z Score model, Springate S Score model. In the study, the probability of bankruptcy and failure was tried to be determined by using the Fulmer H score model, Ohlson Score model, Altman Z Score model and Springate S Score models of the data in the balance sheet and income statements of the companies for the years 2001-2021. Fulmer H score model, Ohlson Score model, Altman Z Score model and Springate S Score model values of companies include the numerical values of the probability of financial failure and the interpretations of companies being in a positive, uncertain and risky area.

Keywords: Financial Failure, DOWJONES30, DJIA, Altman Z-Score Model, SpringateScore Model, Fulmer Score Model, Ohlson Score Model .**Gel Code:** G01, G10,G15, G32

**A SECURE ALGORITHM FOR MANAGEMENT OF CLOUD BASED PICTURE
ARCHIVING AND COMMUNICATION SYSTEM USING LINEAR FEEDBACK
SHIFT REGISTER**

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Abstract

This work (A secure algorithm for management of cloud-based picture archiving and communication system using Linear feedback shift register) investigates the critical challenge of ensuring security within cloud-based Picture Archiving and Communication Systems (PACS), which are pivotal for the healthcare sector's shift towards digital medical image storage and communication. Despite the widespread adoption of Digital Imaging and Communications in Medicine (DICOM) standards, traditional PACS frameworks exhibit significant vulnerabilities, including poor security, scalability issues, and maintenance challenges. These deficiencies are attributed to the early-stage development of DICOM standards, which do not meet contemporary network security or efficiency requirements. Moreover, the outsourcing of patient medical data to cloud service providers introduces risks related to data breaches, theft, and unavailability, highlighting the necessity for robust security measures. Aiming to address these concerns, the study proposes a novel secure algorithm that leverages a hybrid cryptographic scheme, integrating Linear Feedback Shift Registers (LFSR) with the Advanced Encryption Standard (AES) for enhanced security. The research unfolds in several phases, beginning with the development of a PACS attack model to understand vulnerabilities and attack techniques. Subsequently, a new vendor-neutral architecture is designed to return system management control to the owner, ensuring holistic confidentiality and integrity of DICOM files. The study also presents an in-depth evaluation of the proposed system's security performance. The significance of this research lies in its potential to advance the security mechanisms of cloud-based PACS, thereby safeguarding sensitive medical information against unauthorized access and cyber threats. It contributes to the field by offering a comprehensive solution that not only enhances the security of medical image storage and communication but also addresses the key challenges of key management and patient data privacy within the DICOM standard. By ensuring the integrity, confidentiality, and availability of medical images, this work supports the healthcare industry's ongoing efforts to improve patient care through secure and efficient digital imaging technologies.

Keywords: Cloud-based PACS; Linear Feedback Shift Register (LFSR); DICOM standards; Hybrid cryptographic scheme; Medical image security.

**INDEPENDENT HYBRID POWER SYSTEM FOR RURAL AREAS (AL-HENIYAH,
LIBYA)**

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Abstract

Rural communities lacking access to the electricity grid primarily depend on diesel generators and wood as their main sources of energy. Nevertheless, these energy sources suffer from a lack of economic efficiency and pose detrimental effects on the community's health as a result of greenhouse gas emissions. Hybrid power systems are becoming increasingly popular in off-grid and rural areas because they offer improved efficiency, reliability, and sustainability compared to traditional renewable energy systems. The objective of this study is to investigate the feasibility of implementing a hybrid solar, wind, battery, and diesel system for the purpose of providing power to a rural community, specifically Al-Heniyah, which is situated in the Jebel Al-Akhdar District in northeastern Libya. To accomplish this objective, the study employs Homer Pro software, which enables precise modelling of energy supplies, load demand, and components. The most efficient option, as determined by HOMER simulation, is a hybrid system consisting of solar photovoltaic panels, wind turbines, and batteries. This configuration has a net present cost (NPC) of \$3.81 million and a leveled cost of electricity (LCOE) of \$4.88 per kilowatt-hour (kWh) for our specific situation. The results also showed a significant eradication of greenhouse gas (GHG) emissions, obtaining a complete elimination of 100%. The achievement was credited to the implementation of an optimal setup featuring a 100% proportion of renewable resources. Ultimately, the research strongly advocates for the adoption of a hybrid solar PV, wind, turbine, battery, and diesel system, as simulated by HOMER Pro software, for the purpose of supplying electricity to off-grid rural towns like Al-Heniyah in northeastern Libya. **Keywords:** Homer pro software, environmental impact, economic impact, hybrid power systems, Libya.

INTRUDACTION

The preservation of energy is crucial for the progress of a nation, and there is an increasing utilization of renewable energy sources. Reliability and efficiency are concerns associated with these technologies. Oil imports diminish foreign currency reserves, rendering renewable energy the optimal choice. Political conflicts hinder the majority of rural regions in developing countries, particularly in Africa, from obtaining access to the electricity distribution network [1,2].Regulative concerns and power supply outages also pose challenges in rural and non-electrified areas. These autonomous systems are unable to offer a consistent supply of energy due to their seasonal nature. For instance, an independent solar photovoltaic energy system is unable to deliver consistent electricity during periods of low sunlight. The autonomous wind system is unable to meet consistent power requirements due to substantial variations in wind speeds, which occur from hour to hour throughout

the year. Consequently, energy storage systems will be necessary for each of these systems to provide the power requirements. Typically, storage systems are costly, and it is necessary to minimize their size to make renewable energy systems economically viable. Hybrid power systems have the potential to decrease the amount of energy storage needed [3]. The escalating need for energy, particularly in developing nations, has led to increased focus on the energy crisis. The utilization of fossil fuels for electricity generation is a substantial human-caused contributor to the rise in CO₂ emissions and the worsening of environmental issues. As stated by Asheibi and Khalil [4], there will be a long-term growth in the demand for power, leading to a corresponding increase in the usage of fossil fuels for electricity generation. Hence, renewable energy sources, such as wind or solar power, have the potential to be the optimal remedy for curbing the nation's reliance on fossil fuels and mitigating carbon dioxide emissions. Libya possesses abundant renewable energy sources, specifically wind and solar energy. The country exhibits a wide range of wind power density, with values ranging from 164 to 426 W/m². Additionally, the annual average photovoltaic (PV) power varies from 1753 kWh/kWp in coastal strip regions to 2045 kWh/kWp in southern regions, as indicated by wind and solar atlas maps. In addition, the yearly average of sunshine duration ranges from 3100 to 3900 hours. Many scientific studies have evaluated the capacity of renewable energy, such as solar and wind energy, throughout the nation. Mohamed et al. [5] examined the present usage and future prospects of renewable energy in Libya. It was determined that renewable energy has the capacity to meet the energy requirements of the nation. This study provides a feasibility analysis on the utilization of a hybrid PV-wind-battery system, supplemented by a backup generator, for the purpose of providing electricity to rural areas. While numerous studies have been conducted in Libya to evaluate the viability of utilizing hybrid renewable energy sources, there remain certain regions where such studies have not yet been undertaken. The primary objective of this study is to examine the potential for utilizing wind and solar energy in the northeastern region of Libya to provide electricity for rural areas. The meteorological data included in this study is acquired from the NASA website, while the feasibility analysis is conducted using the Hybrid Optimization Model for Electric Renewable (HOMER) Pro program. The HOMER Pro software conducts optimization and determines the ideal configuration of the renewable energy sources included in the study. The structure of this document is as follows: In Section II, the objectives of this study area are presented. Section III outlines the technique, which contains the study location, the load profile, and the steps that follow. Section IV contains the results and discussions, while Section V provides the conclusion.

LITERATURE REVIEW

Alweheshi et al. [6] Explored the use of renewable energies as a means to enhance the energy situation in Libya. The findings suggested that these energies have the potential to decrease the reliance on fossil fuel consumption.

Khalil et al. [7] Examined the practicality of substituting the grid-connected HPS (high pressure sodium) lamps street lighting system with a solar-powered LED (light-emitting diode) street lighting system for a 4-km road in Libya. The findings demonstrated that the suggested system effectively decreased CO₂ emissions and fuel consumption, while also being economically viable.

Zuheir et al. [8] The proposal suggests implementing photovoltaic (PV) solar water heating and PV-thermal systems as alternatives to electrical heaters in households. This would effectively decrease the maximum energy demand on the Libyan electric grid. The results demonstrated that the PV-thermal system exhibits superior efficiency in comparison to the alternative system under consideration.

Kadem et al. [9] Evaluated the technological and economic factors of a 14 MW photovoltaic (PV) plant in Houn city, Libya. The findings indicated that the photovoltaic power plant is both economically viable and environmentally sustainable.

Embirsh and Ikshadah [10] Calculated the average monthly solar radiation and duration of sunlight to analyze the specific attributes of radiation and sun ray duration in Tripoli, Libya. The authors' conclusion states that solar energy is widely recognized as a primary and sustainable source of energy in Libya.

Although existing studies have emphasized the promising potential of renewable energy solutions in Libya, there are still several important research gaps that need to be addressed: 1) Thorough examination of the practicality of hybrid systems, 2) Emphasis on contrasting urban and rural environments, 3) Evaluation of the financial and ecological effects, 4) Actual application and potential for expansion, and 5) Contrasting with conventional energy systems. By filling these knowledge gaps, future research can offer a comprehensive comprehension of the possibilities and obstacles of hybrid renewable energy systems in rural Libya. This will help in creating more efficient and sustainable energy solutions for off-grid communities such as Al-Heniyah.

MATERIALS AND METHODS

This study investigates the economic and environmental viability of introducing a Hybrid Renewable Energy System (HRES) for electricity production in a particular rural village situated in Al-Haniya, Libya. The selected hamlet acts as the central location for the evaluation, where the optimization process includes factors such as solar photovoltaic (PV) systems, wind turbines, generators, and batteries. The HOMER optimization program is used as the analytical framework for this optimization study. It plays a crucial role in conducting a thorough comparative examination of different configurations and designs. This program facilitates a methodical assessment of the technical and economic advantages of various components, hence enabling an educated decision-making process for the designer. The next portions of this study offer comprehensive analysis of the geographical setting of the selected area, the implementation of the HOMER optimization program, and a thorough examination of the Renewable Energy Sources (RES) employed in the study. This research intends to provide significant insights into the possible benefits, obstacles, and sustainability aspects of adopting a Hybrid Renewable Energy System in rural areas, namely in the Al-Haniya region of Libya.

1.1. Study location

This research will focus on the Al-Haniya area, Coordinates: latitude $32^{\circ}50'28''N$ longitude $21^{\circ}31'15''E$ as presented in figure 1, situated in the eastern region of Libya along the coast of Jabal Al-Akhdar [11]. Table 1 shows the presents a monthly average wind speed of 6.56 m/s, and Table 2 shows the clearness index and solar radiation profile of the research area, which was determined using HOMER. The research area experiences an average solar radiation of 5.02 KWh/m²/day, as determined by NASA.



Figure 1: A map showing the rural area of Al-Haniyah

1.2. Wind Resources

The village benefits from a significant abundance of wind energy. The data obtained from NASA using the HOMER software shows that Al-Haniya village has an average wind speed of 6.56 m/s over a period of 10 years. The wind speed varies between 5.600 and 7.850 m/s, as shown in Figure 2 and Table 1. The highest wind velocity is attained in February, whereas the lowest speeds are observed in September and October, typically corresponding to the autumn season.

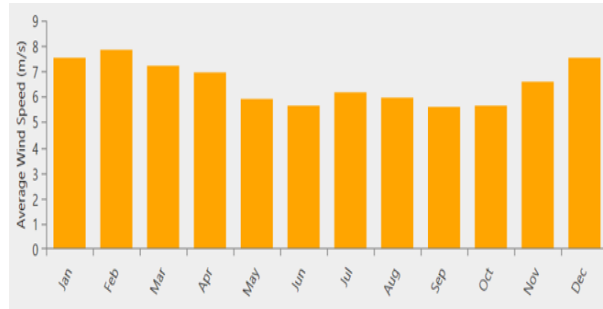


Figure 2: Wind speed variation during the year.

Based on the documented wind speeds, it is clear that wind energy can be harnessed for an independent power system in Al-Haniya village. Table 1 displays the mean wind speed and clearness index on a monthly basis for the research area. From [12] The operational range for wind power typically falls between a cut-in speed of 2.5 m/s and a cut-out speed of 25 m/s.

Table1: Monthly average wind speed data

Month	Average(m/s)
Jan	7.560
Feb	7.850
Mar	7.200
Apr	6.970
May	5.910
Jun	5.660
Jul	6.190
Aug	5.970
Sep	5.600
Oct	5.660
Nov	6.570
Dec	7.550

1.3. Solar Potential

The sun irradiation data of Al-Haniya village was acquired from the NASA website using the HOMER software. The mean solar irradiation of Al-Haniya village during a period of 22 years is 2.340 kilowatt-hours per square meter per day and 7.570 kilowatt-hours per square meter per day. The peak solar irradiance occurs in June, while the lowest levels are observed in December, typically during winter, and in January, which coincides with the rainy season. Figure 3 illustrates the fluctuations in solar irradiance based on the months of the year, while Table 2 displays the average monthly solar irradiance at the study site. The measured solar irradiance confirms that Al-Haniya village possesses the necessary solar irradiance to harness solar energy for power generation.

Table2: Monthly average solar global horizontal irradiance GHI data

Month	Clearness Index	Daily Radiation (kWh/m ² /day)
Jan	0.468	2.550
Feb	0.511	3.440
Mar	0.555	4.700
Apr	0.600	6.050
May	0.620	6.890
Jun	0.659	7.570
Jul	0.665	7.500
Aug	0.642	6.690
Sep	0.614	5.520
Oct	0.564	4.080
Nov	0.507	2.900
Dec	0.464	2.340

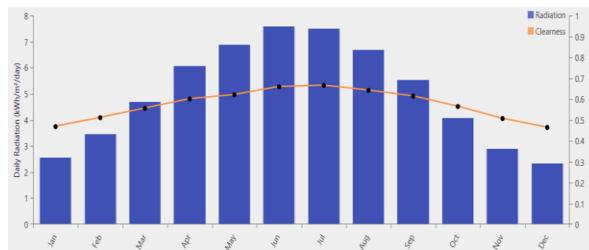


Figure 3: Solar radiation variation during the year

1.4 Diesel generator

There is an expectation that the cost of fuel in Libya would rise, reaching an average of \$1 a liter. The escalation is intricately connected to the oscillations in crude oil prices, since the costs of diesel rise in parallel with the increases in crude oil prices and, conversely, decrease when crude oil prices reduce. Moreover, the possibility of incurring extra expenses for transporting diesel to remote regions could lead to an increase in the price of diesel, potentially reaching approximately \$1 per liter. The interplay between global oil dynamics and local logistical constraints emphasizes the volatility character of diesel pricing in the regio.

1.5 HOMER software

Multiple software applications are utilized for doing feasibility studies of energy producing systems. The software mentioned includes RET Screen, iHOGA, Hybrid 2, and HOMER. Regarding in this study, the HOMER program has been chosen to do the feasibility analysis because of its excellent capabilities. The HOMER program was developed by the National Renewable Energy Research Laboratory (NERL) specifically for optimizing renewable energy systems that are connected to the grid or operate independently. HOMER software offers a significant benefit in terms of its ability to efficiently handle important optimization, simulation, and sensitivity analysis activities [13,14]. Figure 4 illustrates the various functions of HOMER.

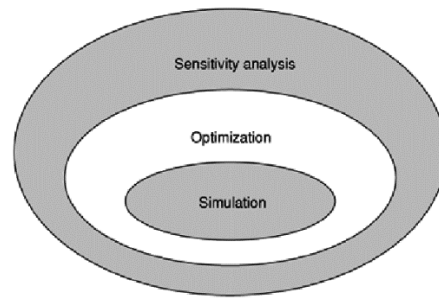


Figure 4. HOMER three core capabilities.

The HOMER software employs a range of renewable energy sources, including hydro turbines, wind turbines, photovoltaic systems, diesel generators, and fuel cells. The simulation is conducted by utilizing inputs such as load profile, meteorological data, components data, system economics, and technical constraints. The HOMER software generates the Net Present Cost (NPC) as its output [15], Total Capital Cost (TCC), fuel consumption, Cost of Energy (COE), excess energy, Renewable Fraction (RF), and the optimal system configuration that determines the most suitable arrangement [16].

ASSESSMENT OF RENEWABLE ENERGY RESOURCES AND ANALYSIS OF LOAD PROFILE

This section provides an overview of the community's load profile, which is a crucial component of the study. The load profile provides insights into the temporal patterns of electricity consumption within a community, thereby revealing the specific energy requirements. Subsequently, the study thoroughly presents comprehensive data on Photovoltaic (PV) components. This entails an examination of the specifications, efficiency, and various parameters of the solar energy system that impact the performance of the PV components in the proposed hybrid renewable energy system. In order to comprehend the wind turbine system that is incorporated into the energy infrastructure, comprehensive data on Wind Components is provided. In order to comprehend the role of wind energy in the system, it is necessary to take into account wind speed patterns, turbine capacity, and efficiency. Subsequently, the battery, a crucial element of the energy storage system, is examined. This encompasses factors such as battery type, capacity, charging and discharging rates, and efficiency, underscoring the significance of energy storage in maintaining power supply stability. The specifications, fuel type, capacity, and efficiency of the Generator are also assessed. This section aims to elucidate the underlying principles that enable the proposed Hybrid Renewable Energy System to function by thoroughly analyzing each individual component.

2.1. Load estimation

The primary utilization of power in the Al-Haniyah area is for heating, lighting, and various applications including air conditioning, cooling, and electronics. The Al-Haniyah compound has residential units, a dining facility, an educational institution, and an administrative facility. Heating, Air Conditioning, and lights account for a significant portion of power use, comprising around 80% of the overall load. Furthermore, Electronics account for around 18% of the whole burden. The Al-Haniyah experienced a peak load and yearly average demand of 2.8 MW and 2.8 million kilowatt-hours (kWh) per day, respectively, with a load factor of 0.3. The load data is inputted into the HOMER programmer to generate graphical representations of the daily and monthly load profiles, as seen in figures 5 and 6.

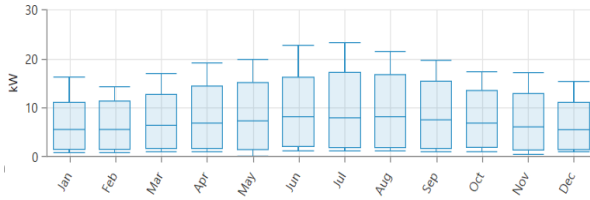


Figure 6. Monthly Load Profile

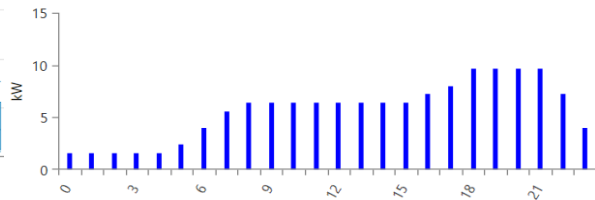


Figure 5. Hourly Load Profile

2.2. The PV data specifications

The PV's technical data utilized in this study is displayed in Table 4, while the cost parameters are presented in Table 6. The derating factor and the lifespan of the photovoltaic (PV) system employed. They are 90% and 25 years, respectively. The PV panel has an annual power output of 6,108 kilowatt-hours. PV power output as shown in Figure 7.

Table 4. Technical specifications of the generic flat plate solar PV

Parameter	Value	Units
Rated capacity	3.42	kW
Mean output	0.697	kW
Mean output per day	16.7	kWh/day
Capacity factor	20.4	%
Hours of Operation	4,359	hrs/yr
Total production	6,108	kWh/yr
Dedicated converter	4.00	kW

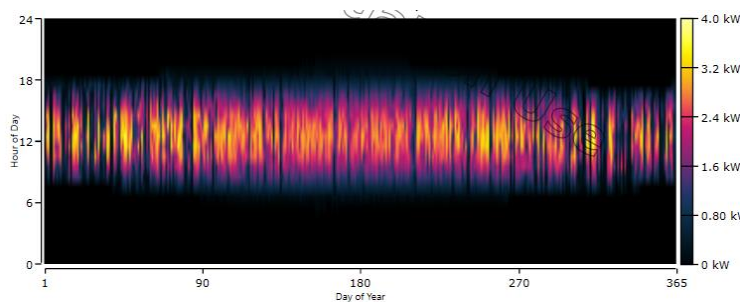


Figure 7: PV power output

2.3 Wind turbine specifications

The wind turbine technical parameters used for this study is shown in Table 5 provides a detailed summary of the technical parameters related to the wind turbine used in this study. These parameters include important details such as the rated capacity, average output, maximum output, capacity factor, and total production. Each of these specifications is crucial in defining the performance and efficiency of the wind turbine in the proposed Hybrid Renewable Energy System. The cost parameters related to the wind turbine are thoroughly outlined in Table 6. These parameters include a range of financial factors, such as the costs associated with setting up the wind turbine, ongoing maintenance expenses, and other important financial metrics that are necessary for a thorough economic evaluation of the component. The cost-related specifics are essential for evaluating the overall financial feasibility and

long-term sustainability of incorporating the wind turbine into the hybrid energy infrastructure. This study seeks to gain a comprehensive understanding of the role and economic consequences of integrating a 1.5 MW wind turbine into the proposed Hybrid Renewable Energy System by analyzing technical and cost-related factors. A thorough examination is essential for making well-informed decisions about incorporating wind energy into an off-grid power system that is both sustainable and efficient for the chosen community. Wind turbine power output as shown in Figure 8.

Table 5. Technical specifications of the generic wind turbine

Parameter	Value	Units
Total Rated capacity	1,500	kW
Mean output	717	kW
Maximum output	1,500	kW
Capacity factor	47.8	%
Hours of Operation	7,424	KWh/yr
Total production	6,278,967	kWh/yr

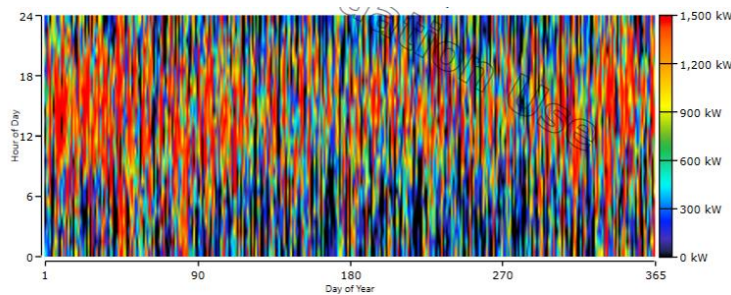


Figure8: Wind Turbine Power Output

2.4 Diesel generator specifications

The diesel generator employed for this research is the standard 500 kW fixed capacity genset. The upfront and subsequent expenses of this generator are outlined in table 6. The minimum load ratio of the generator is 25% and has 15000 hours longevity operation.

2.5 Battery specifications

The battery utilized in this research is a Generic 1kWh Lead Acid battery with specifications of 83.4 Ah, 12 V, and a capacity of 1 kWh. The system comprises a parallel configuration of 259 batteries, resulting in a 3108V bus. It achieves a round trip efficiency of 100% and maintains a minimum state of charge (SOC) of 40%. The battery has a life span of 10 years, with a total energy output of 800 kilowatt-hours (kWh). It has a nominal capacity of 1 kWh and can operate independently for 22.5 hours. The battery cost is displayed in Table 6.

2.6 Converter specifications

The study utilized a 16.9 kW inverter with a rectifier relative capacity of 100% and a rectifier efficiency of 95%. The device has a lifetime of 15 years and an inverter efficiency of 95%. The cost specifications of the converter are outlined in Table 6.

Table 6. Data of components in a hybrid system

Parameter	Value	Units
	Solar PV	
Ground reflection		%
Capital cost/kW	3,000.00	\$
Replacement cost/kW	3,000.00	\$
O&M cost	10.00	\$
Lifetime	25	Years
	Wind Turbine	
Capital cost/kW	3,000,000.00	\$
Replacement cost/kW	3,000,000.00	\$
O&M cost	30,000.00	\$
Lifetime	20	Years
	Diesel Generator	
Capital cost/kW	150,000.00	\$
Replacement cost/kW	150,000.00	\$
O&M cost/hr	5.000	\$
Lifetime	15,000.00	Hour
Minimum load ratio	25.00	%
	Battery	
Initial cost	300	\$
Replacement cost	300	\$
O&M cost	10.00	\$
Roundtrip efficiency	80	%
Lifetime	10	Years
Minimum state of charge	40	%
	Converter	
Capital cost/kW	300.00	\$
Replacement cost/kW	300.00	\$
O&M cost	0.0	\$
Lifetime	15	Years
Efficiency	95	%
Rectifier capacity	100	%

RESULT

The initial phase of the inquiry involves evaluating the available renewable energy sources. The second phase entails approximating the electricity consumption of the Al Hanya area. Subsequently, the HOMER software was employed to ascertain the energy composition and cost outcomes by utilizing many input factors and accessible renewable energy supplies. Figure 9 illustrates the comprehensive approach used in the pre-feasibility analysis of the Al Hanya area energy mix. The design was formed using the HOMER software, taking into account local factors, cost parameters, energy resources, and other significant simulation characteristics. The optimization in HOMER was

simulated over a period of 25 years in order to get the lowest NPC while satisfying the power demand. Various configurations involving the generator, solar PV, wind, and batteries were suggested. Therefore, three combinations, labeled as scenarios 1–3, were simulated as shown in Table 7.

Table 7. Scenarios that have been simulated

Architecture						
Scenarios	Vario Track VT-65 (kW)	Vario Track VT-65-MPPT (kW)	Wind turbine G 1500	500Kw Gen (kW)	Battery 1kWh LA	Converter (kW)
Scenario 1	107	4.00		500	765	105
Scenario 2				500	828	105
Scenario 3	3.42	4.00	1		259	16.9
Cost						
Scenarios	NCP \$		LCOE (\$/kWh)		Operation Cost \$	
Scenario 1	\$469,310		\$0.601		\$21,647	
Scenario 2	\$578,205		\$0.740		\$30,559	
Scenario 3	\$3.81M		\$4.88		\$62,473	
System						
Scenarios	Total Fuel (L/yr)					
Scenario 1	18,638					
Scenario 2	25,350					
Scenario 3	0					

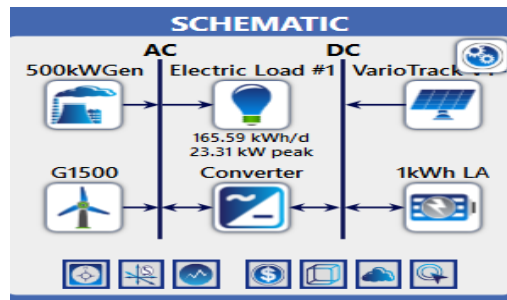


Figure 9. Hybrid solar-wind-battery-diesel system

DISCUSSION

The photovoltaic (PV) system comprises solar PV panels with a capacity of 111 kW, 765 batteries arranged in parallel, and an inverter with a conversion capacity of 105 kW. The generator utilized a combined amount of 18,638 liters of fuel annually. The system's electricity cost, referred to as the cost of electricity (COE), amounts to \$0.601 per kilowatt-hour (kWh). Furthermore, the overall net present cost (NPC) of the system is \$469,310. The hybrid system incurs an operational expenditure of \$21,647. Hence, if the generator consumes a cumulative amount of 18,638 liters of gasoline per year, it would release an estimated 42,926.4 kilograms of CO₂ on an annual basis.

In this scenario, by solely depending on the generator and not utilizing any other forms of energy, the operational costs increased by \$30,559 in this situation. Furthermore, there was a \$578,205 increase

in the Net Present Cost (NPC) and a \$0.740 increase in the Cost of Energy (COE). In addition, the fuel consumption increased to 25,350 liters annually. Not using alternative energies leads to a significant environmental impact. Generators typically run on fossil fuels, which are widely recognized for their contribution to air pollution and the release of greenhouse gas emissions. It would release around 58,155 kilograms of CO₂ per year. These activities cause environmental damage and contribute to the occurrence of climate change.

The PV system comprises solar PV panels with a 4.42 kW capacity, 259 batteries arranged in parallel, and an inverter with a 16.9 kW conversion capacity. Furthermore, there is a wind turbine that has a power output of 1.5 megawatts. The electricity cost (COE) for this system is \$4.88 per kilowatt-hour (kWh), and the total net present cost (NPC) is \$3.81 million. The hybrid system incurs an operating cost of \$62,473. It is crucial to emphasize that the electricity provided by this hybrid system is entirely derived from renewable sources and does not produce any emissions.

CONCLUSION

In conclusion, the research emphasizes that hybrid renewable energy systems, utilizing HOMER Pro software, are a practical and effective solution for meeting the energy requirements of rural regions in northeastern Libya. Although the initial expenses may be substantial, the long-term economic and environmental advantages validate the financial commitment. Implementing such systems can effectively mitigate CO₂ emissions, decrease operational expenses, and foster sustainable development in the region.

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HEALTHY FOODS AND DRINKS AND THEIR HIDDEN DANGERS

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Abstract

In the last decades, a plethora of research has been published in the fields of food and nutritional sciences. Multiple *studies have demonstrated unequivocally* that eating processed foods increases our risk of obesity, type 2 diabetes, cancer, heart issues, and early death. Among the food and drinks that are currently classified as unhealthy, we can remember meats from the grill and other burnt foods, snacks such as microwave popcorn, chips, pretzels, sweetened dairy products, French fries, and potato chips), sugary drinks, alcoholic drinks and so forth. On the contrary, a lot of papers discussed several foods and drinks that are rich in essential nutrients and antioxidants and have a protective effect against a lot of diseases. Many people believe that if they consume large amounts of healthy foods, they will have additional benefits. This paper aims to explore some of the healthy food and drinks and their hidden dangers. The healthy foods and drinks subjected to our analysis are avocado, olive oil, honey, dark chocolate, green tea, and water. We will emphasize the unexpected side effects of high levels of consumption of each of the above-mentioned foods and drinks. Thus, we will discuss about:

- Potential high-calorie intake, weight gain, gastrointestinal issues, and risks for allergy as side effects of eating an avocado every day.
- Weight gain and obesity, heart disease, and medication interactions as risks associated with excessive olive oil intake.
- Weight gain and obesity, increased blood sugar level, hypotension, gastrointestinal effects, tooth decay, and allergies when you consume a lot of honey.
- The content of cadmium and lead in dark chocolate are two heavy metals that are dangerous to overall health.
- Drinking green tea in high doses, a situation which might lead to liver injury, headaches, and irregular heartbeats.
- The water intoxication symptoms include headaches, nausea, vomiting, increased blood pressure, and difficulty breathing.

Last, the paper discusses the adulteration of products such as olive oil and honey. As a conclusion of this paper, even in the case of healthy food and drinks, we must consider the dose and the brand.

Keywords: avocado, olive oil, honey, dark chocolate, green tea, water

**FROM CAFFEINE TO ETHANOL: COMMON AND UNEXPECTED CHEMICAL
COMPOUNDS ON WHO'S ESSENTIAL MEDICINES LIST**

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Abstract

The World's Health Organization (WHO) Model List of Medicines is a register of minimum medicines considered most effective and safe to meet the most critical needs of every healthcare system. First published in 1977, the list is updated every 2 years by a committee of experts from around the world.

It is not at all surprising to find very well-known drugs on this list: antihypertensive medications such as amlodipine, bisoprolol, and enalapril, medicines used in heart failure such as hydrochlorothiazide, digoxin, antithrombotic medicines such as acetylsalicylic acid, lipid-lowering agents such as simvastatin, non-opioids and non-steroidal anti-inflammatory drugs (NSAIDs) such as paracetamol, ibuprofen, beta lactam medicines (antibacterials) such as amoxicillin, amoxicillin + clavulanic acid, ampicillin, cytotoxic and adjuvant medicines such as doxorubicin and carboplatin.

Moreover, the WHO Model List of Essential medicines, includes a lot of unexpected, at first glance, simple chemical compounds, organic or inorganic, synthetic or natural, found in most chemistry laboratories.

The aim of this paper is to discuss about some of these compounds, apparently trivial, but so important for the medical system.

Thus, the paper discusses about:

- gaseous compounds such as oxygen (O_2), nitrous oxide (N_2O) halothane $C_2HBrClF_3$;
- inorganic compounds such as potassium ferric hexacyanoferrate (II) $-2H_2O$ (Prussian blue), sodium thiosulfate, magnesium sulfate, potassium iodide, arsenic trioxide, ferrous salt, selenium sulfide, potassium permanganate, barium sulfate, chlorine-based compounds, calamine, zinc sulfate, sodium nitroprusside;
- organic compounds such as urea, benzyl benzoate, fluorescein, dextran, lactulose, ethanol, propanol, and benzoyl peroxide;
- natural alkaloids such as quinine, atropine, morphine, and codeine;
- carbon-based compounds such as activated charcoal, coal tar,

Each compound is discussed in a larger perspective. For each of them, the methods of synthesis, their general uses, and the reasons why they were included in the list of essential medicines are presented.

Keywords: WHO Model List of Essential Medicines

TARGETING METABOLIC PATHWAYS FOR THERAPEUTIC INTERVENTION: A PROMISING APPROACH IN PRECISION MEDICINE

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Abstract

Numerous diseases, such as metabolic disorders, cancer, and neurodegenerative ailments, are characterized by metabolic dysregulation. As a potentially effective and less side effect-prone therapeutic intervention approach, targeting metabolic pathways has gained traction. This review examines current developments in our knowledge of metabolic pathways and how they contribute to the etiology of disease. We talk about cutting-edge treatment strategies meant to alter important metabolic functions like amino acid metabolism, fatty acid metabolism, and glycolysis in order to maintain cellular homeostasis and stop the progression of disease. We also emphasize the significance of customized medicine in detecting metabolic vulnerabilities and customizing treatment plans for each patient. Optimizing metabolic targeting has the potential to transform the way diseases are treated and enhance patient outcomes.

Keywords: metabolic pathways, therapeutic intervention, precision medicine, metabolic disorders, cancer, personalized medicine

Introduction

Life is supported by the intricate web of biochemical processes known as metabolism, which produces energy and the building components needed for cellular functions. The pathophysiology of many diseases is influenced by the dysregulation of metabolic pathways, which makes them appealing candidates for therapeutic intervention. With an emphasis on treatment approaches meant to restore metabolic balance, this article examines recent developments in our knowledge of metabolic pathways and how they contribute to the development of disease.

Glycolysis and Cancer: The Warburg effect, which is characterized by increased glucose uptake and glycolytic flux, is one example of how altered metabolism is present in cancer cells. It has been demonstrated that targeting glycolytic enzymes, such as pyruvate kinase and hexokinase, can prevent the spread and multiplication of cancer cells [1]. Moreover, lactate dehydrogenase inhibitors—which stop pyruvate from being converted to lactate—are being researched as possible anticancer drugs [2].

Fatty Acid Metabolism in Metabolic Disorders: Type 2 diabetes and obesity are examples of metabolic diseases linked to dysregulated fatty acid metabolism. Potential therapies for metabolic syndrome include therapeutic strategies that target enzymes involved in fatty acid production and oxidation, such as carnitine palmitoyltransferase and acetyl-CoA carboxylase

[3]. Furthermore, it has been shown that AMP-activated protein kinase (AMPK), a crucial regulator of energy metabolism, can be stimulated to enhance lipid metabolism and insulin sensitivity [4].

Amino Acid Metabolism and Neurodegenerative Diseases: Neurodegenerative disorders such as Parkinson's and Alzheimer's disease have been linked to changes in amino acid metabolism. It may be possible to avoid neurotoxicity and neuronal death by therapeutically targeting enzymes involved in amino acid synthesis and catabolism, such as glutaminase and branched-chain amino acid transaminase [5]. Furthermore, controlling the kynurenine pathway, which breaks down tryptophan, offers a potential strategy for controlling oxidative stress and neuroinflammation in neurodegenerative diseases [6].

Personalized Medicine and Metabolic Targeting: Metabolomics, proteomics, and genomics are examples of omics technologies that have advanced and made it possible to identify metabolic signatures linked to the development and susceptibility of disease. These signals are used by personalized medicine techniques to categorize patients according to their metabolic profiles and modify treatment plans accordingly [7]. Improved patient outcomes may result from more effective medicines with fewer side effects when metabolic pathways are precisely targeted.

Conclusion

A promising strategy for therapeutic intervention in a variety of diseases, including cancer and neurological disorders in addition to metabolic disorders, is to target metabolic pathways. We can transform the way we treat diseases and open the door to personalized medicine by comprehending the metabolic weaknesses of diseased cells and taking advantage of them with targeted medicines. In the end, new treatment targets and approaches will surely be found through ongoing study into metabolic pathways and their control, which will enhance patient care and quality of life.

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INVESTIGATION OF PLANAR AIR JET IMPINGING ON CONCAVE AND CONVEX SURFACES

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Abstract

In engineering, solving the problem of cooling systems that reach high temperatures efficiently and in accordance with the purpose is one of the main research topics. There are a wide variety of cooling methods suitable for the structure of the system. For example, keeping the temperature of high-temperature engines in automobile engines at reasonable values with the help of ventilators, cooling houses with the help of air conditioners and so on. This study has been prepared in two dimensions. It is a theoretical review of impinging jet studies in the literature and an experimental study of jet impingement on convex-concave surfaces. In the study the temperature distribution of the planar air jet generated in a suction air tunnel experimental chamber was tried to be determined experimentally by impinging on concave and convex surfaces. The experiments were carried out in the form of finding the temperature distribution on the surface by impinging the hot jet stream on cold surfaces.

Keywords: Impinging jet, Heat transfer, Air tunnel.

INTRODUCTION

Jet cooling systems are a system that has been used for a long time in gas turbines and is used in many industrial areas such as cooling turbine blades heated by high-temperature combustion gases in modern airplanes with jet engines, as well as tempering glass sheets, dyeing and drying textile and paper products, and cooling of electronic circuits. For maximum heat transfer, the turbulence level of the impinging jet, the distance of the nozzle from the surface center, and the angle of the nozzle are important problems. In addition, the shape of the nozzles (single, multi-row, long, narrow, slit, two-dimensional, etc.), size, height, distance between the nozzles, velocity, temperature, density of the impinging fluid, the way it hits the surface (rotating, angled, oblique, perpendicular, etc...) are the parameters that affect the transfer phenomenon. The first studies on this subject are related to the determination of the flow regime regions of the free jet discharged to the external environment, the flow characteristics and the static pressure measurements created on the plate by the impinging jets [1,2].

Since 1970, studies have been carried out on the measurement and calculation of the velocity fields and turbulence intensity of the crashing jet, depending on the development of measurement

techniques and computer technology. In today's studies, effective parameters such as heat transfer, flow regime and turbulence magnitude have been considered together and their interactions with each other have begun to be examined in more detail [3-5]. One of the objectives of studies on the behavior of the nozzle system and jets is to provide heat transfer data. Regarding the experimental data and the applicability of a theoretical solution, researchers have concluded that the structure of the flow is very complex; the flow characteristics vary along the flow; the number of parameters required to determine the exact problem is very large [6,7].

This study is presented in two dimensions. The first is a theoretical review of the impinging jet studies that have been conducted in the literature. The second is an experimental study of jet impingement on convex-concave surfaces.

In study, the temperature distribution of the planar air jet generated in a suction air tunnel experimental chamber was attempted to be determined experimentally by impinging on concave and convex surfaces. The experiments were conducted by measuring the temperature distribution on the surface by impinging the hot jet stream on cold surfaces.

MATERIAL AND METHODS

The jet flow is provided by the constriction cone with an outlet section of $3 \times 30 \text{ cm}^2$ placed inside the air tunnel. Flow uniformity is achieved with cage systems placed at the inlet of the cone. The current air tunnel installed in our laboratory consists of a resting chamber with a cross-section of $800 \times 800 \text{ cm}^2$, a new cone (jet outlet) placed inside a constricting cone with a cross-section of $300 \times 300 \text{ cm}^2$, a diffuser and a suction fan. At the mouth of the resting chamber, 7 heaters in series are placed horizontally to heat the jet stream. The heaters are driven by a variac.

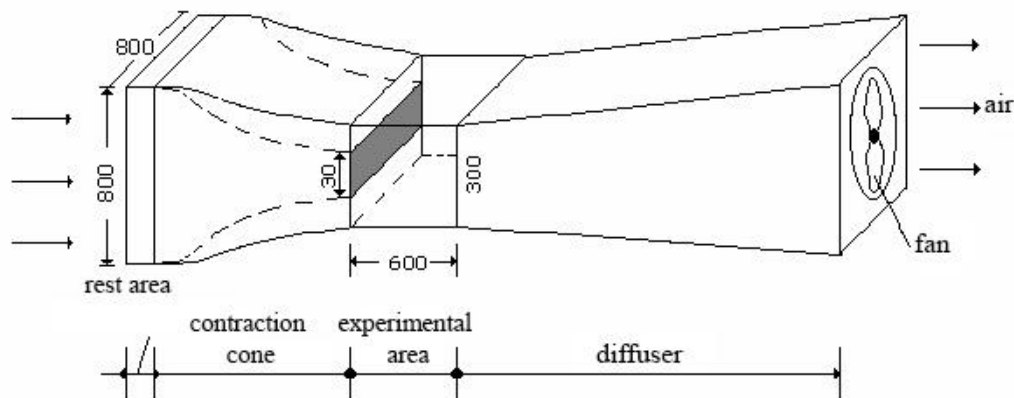


Figure 1. Experimental setup

In the first stage of the experiments, surface temperatures were measured by impinging a hot jet on a convex surface placed inside the experimental chamber. In the second stage, the surface was inverted and a concave geometry was obtained. In the same way, the jet stream was sent and the temperatures on the surface were measured. The target surface was placed 170 mm away from the jet. Target shapes are given on figure 2.

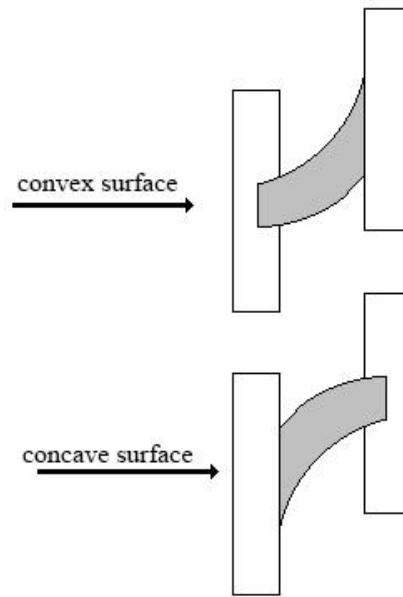


Figure 2. Convex and concave target surfaces

The target surface is formed by bending a 1 mm thick, 100 mm high sheet metal until it reaches a width of 300 mm from the center at an angle 15°. The bent piece is welded to two supports on the sides. Concave-convex surfaces were formed by inverting a single piece. In order to take measurements on the surface, 5 points were determined, one at the center and the others symmetrically along the vertical distance of the center. The experiments were started by supplying current from the power supply to the heaters. When the absorber fan was switched on, the hot stream heated by the heaters exited the jet nozzle and hit the plate. The heating on the plate due to the effect of hot air was determined by measuring the plate temperature with thermoelements.

RESULTS AND DISCUSSIONS

The measured temperatures are expressed by “ θ ”. θ_j ($T_{jet} - T_{environment}$), is the difference between the jet temperature and the ambient temperature. θ_w , ($T_{surface} - T_{environment}$) is the difference between the surface temperature and the ambient temperature. Thus θ_j/θ_w will be calculated as the dimensionless ratio of these two values. Dimensionless distance x is the ratio of the distance of each point measured on the surface to the center point of the surface to the entire plate height. According to this, the heating effect on the convex surface is given in the table.

Table 1. Experimental Results

$T_{jet}=33,3\text{ }^{\circ}\text{C}$ $T_{environment}=20^{\circ}\text{C}$					
	$T_1(^{\circ}\text{C})$	$T_2(^{\circ}\text{C})$	$T_3(^{\circ}\text{C})$	$T_4(^{\circ}\text{C})$	$T_5(^{\circ}\text{C})$
Convex	28,8	29	29,5	29	29,1
Concave	26,9	26,7	47,1	26,7	26,9

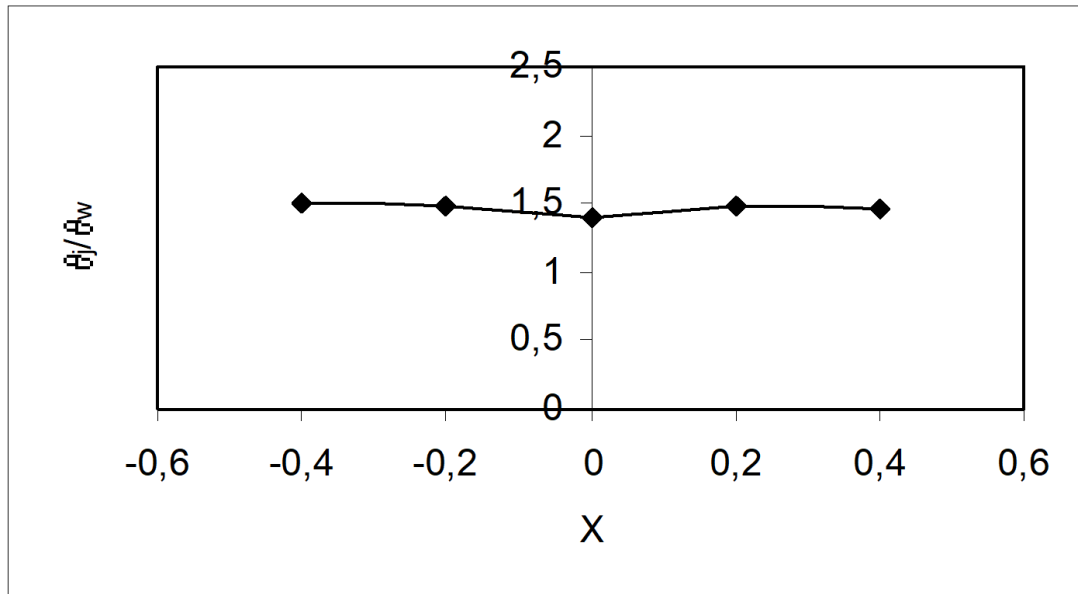


Figure 3. Temperature distribution on convex surface

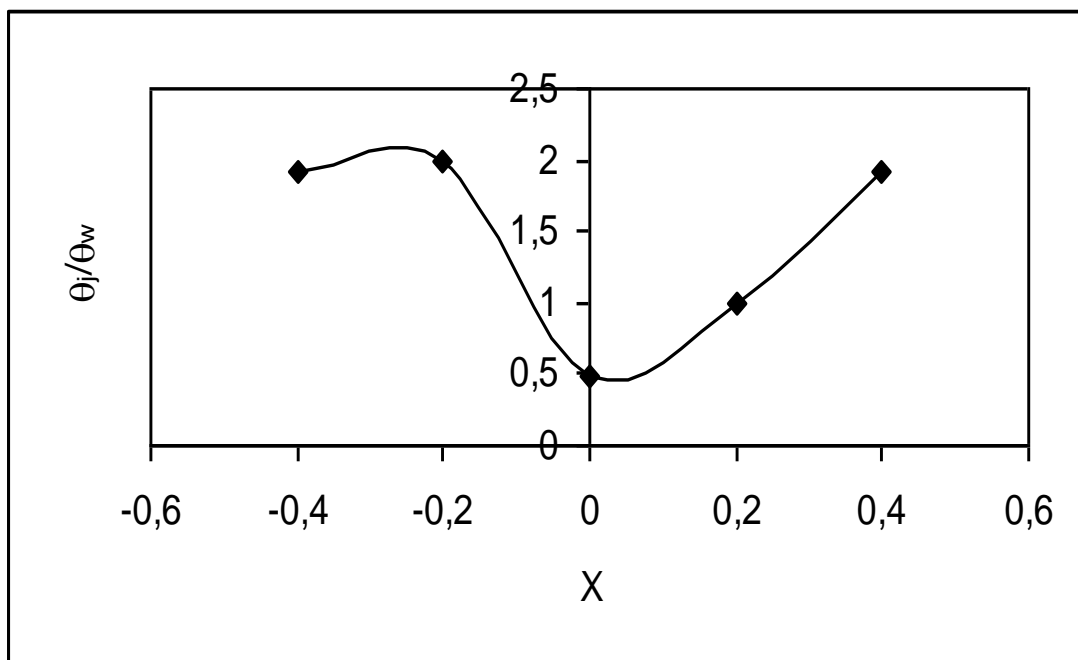


Figure 4. Temperature distribution on concave surface

In this study, the impinging jet, which has a wide range of applications in technology, has been extensively investigated on a theoretical basis. Following the theoretical analysis, the phenomenon of jet impact on non-planar surfaces is experimentally investigated. In particular, the thermal and fluid dynamics behavior of jet impingement on concave and convex surfaces has been

studied in detail in comparison to jet impingement on plane surfaces. The findings have shown significant differences:

Heating at the Stagnation Point: In the case of jet impact on plane surfaces, it has been observed that the heating at the midpoint, called the stagnation point, reaches a maximum on the convex surface. This can be explained by the concentration of the jet flow in the center due to the outward tendency of the surface. On the other hand, it was found that the heating at the stagnation point was not maximum on the concave surface. This is due to the jet flow spreading over a wider area due to the inward tendency of the concave surface.

Temperature Distribution: The effect of the surface geometry was evident not only at the stagnation point but also in the temperature distribution along the surface. On the convex surface, the temperature increased with distance from the center and decreased at the edges after a certain distance. This can be attributed to the jet flow intensifying at the center and weakening towards the edges. On the concave surface, the temperature distribution was more homogeneous and a less pronounced temperature drop was observed from the center to the edges.

Impact of Experimental Findings on Applications: These findings have important practical implications, especially in applications requiring heat transfer and flow control. It is concluded that convex surfaces are more efficient in heating applications, but concave surfaces can provide more uniform heat distribution in certain applications. This information provides valuable clues for optimizing surface geometry in engineering design.

In conclusion, the theoretical and experimental analyses performed in this study have made significant contributions to the literature in this field by investigating the behavior of the impinging jet at different surface geometries in depth. In future research, similar analyses under different flow and heat transfer conditions will allow a wider range of findings to be validated and used more effectively in applications.

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CULTURAL DIFFERENCES IN EMOTION EXPRESSION

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Abstract

The origins of emotional expression have been debated for centuries. Research conducted by mental health experts can summarize the factors that affect people's verbal and non-verbal expressions as social norms, evolutionary instincts and type of emotion. Therefore, it was thought that emotional behavior patterns may emerge with universal roots depending on the type of emotion, or they may be shaped by the influence of the cultural environment. Scientists, who thought that one side was dominant, were divided between these two views as universalist and social structuralist until about the mid-twentieth century. After the mid-twentieth century, the impact of culture g more attention and a new approach has been developed as The Neurocultural approach, which emphasizes that emotions have evolutionary origins but are shaped by social norms. Research conducted in recent years has intensively observed that culture determines a person's "normal" perception, the way he sees the world and, as a result, his emotional communication with the world. Then, it can be said that culture may not be only a part of the way of emotional expressions, it also has a touch on the way people feel. Neurocultural approach has brought those scientists who were splitted into two poles closer and encouraged further research on the contact of culture with the instinctual nature of emotions. Thus, the characteristics of individualist-collectivist community structures, the meaning attributed to power in different societies, the display rules that enable us to control emotions in the social environment, the frequency and quality of trigger events that determine the effect of precursor events, dependent-independent self-modeling, emotional statements in children books and neurocultural approach issues have become the most important research areas of both the social structuralist and universalist approaches.

Key words: Cultural differences in emotions, Individualism-collectivism, Emotional display rules, Neurocultural approach, Self-modeling styles

ERGONOMIC FACTORS INFLUENCING THE HEALTH OF SANITATION WORKERS

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Abstract

Sanitation workers in urban areas play a very important role in collecting garbage to ensure public hygiene. However, many areas in Vietnam, small residential areas, large motor vehicles are inaccessible, so the use of rudimentary means to collect garbage and rely on manual labor to collect garbage is necessary. This job greatly affects the health of workers. In this study, based on surveys of workers and observations of sanitation workers' activities, we analyzed factors affecting workers' health related to musculoskeletal disorders, due to repetitive movements, awkward posture and heavy lifting with hands. The study also examines the role of personal protective equipment (PPE) and its adequacy in protecting workers from occupational hazards. The findings suggest that ergonomic interventions, including redesigning tools and machinery, implementing appropriate lifting techniques, and providing ergonomically designed PPE, are necessary to mitigate health risks. This research aims to contribute to the development of improved occupational health standards and practices for sanitation workers.

Keywords: Ergonomic Factors, Sanitation Workers, Musculoskeletal Disorders, Occupational Health, Protective Equipment.

1. INTRODUCTION

The backbone of our communities' cleanliness and hygiene, sanitation workers, or as they are commonly known, garbage collectors or waste collectors, play an indispensable role in maintaining a healthy and pleasant environment. These dedicated individuals diligently gather waste from residential neighborhoods, bustling commercial establishments, and public spaces, ensuring that our streets remain pristine and free from litter. Their unwavering commitment to their craft not only enhances the aesthetic appeal of our surroundings but also safeguards public health and environmental well-being.

Occupational health of garbage collectors is a primary concern in developing countries (Kandasamy et al., 2013). Garbage collection workers face a high risk of developing musculoskeletal disorders due to the physically demanding nature of the job, which involves repetitive lifting, carrying, pushing, and pulling of heavy objects in awkward postures (Choi et al., 2017; Rushton, 2003). However, musculoskeletal disorders are a burning issue globally due to the increase in ageing population and obesity (Hoy et al., 2014).

The critical importance of improving the health and well-being of waste collection, achieved through preventing work-related accidents, injuries, and illnesses. Ergonomic interventions serve as a preventive transformation aimed at improving occupational well-being (Westgaard and Winkel, 1997). These interventions are broadly categorized into engineering controls, behavioral interventions like ergonomic education/training, and administrative controls such as job rotation and the utilization of personal protective equipment (Kumar and Kumar, 2008). According to Volinn (1999), workplace interventions have proven effective in preventing occupational hazards.

The implementation of ergonomic procedures resulted in reduced muscular and cardiovascular load among cleaners. Regular exercise acts as a practical preventive intervention for musculoskeletal disorders, particularly addressing back and neck pain issues. Therefore, the need for low-cost interventions specifically tailored to waste collection workers is increasingly evident.

Musculoskeletal disorders (MSDs) among sanitation workers are closely linked to the inadequacy of labor training practices. These workers often lack comprehensive training on musculoskeletal injury risk factors and proper work techniques. Furthermore, their low educational attainment limits their ability to effectively absorb job skills training, exacerbating the issue. Therefore, this paper delves into the factors that adversely impact the musculoskeletal system of sanitation workers during their daily tasks. By analyzing these factors, the study will employ ergonomic principles to formulate guidelines for safe and appropriate work practices, thereby minimizing musculoskeletal injuries.

2. ERGONOMICS STUDY

The human body comprises 206 bones of varying shapes, accounting for 60% of body weight. These bones serve crucial functions of support, protection, and blood production. The spine, the most significant structure, consists of 32-35 vertebrae, including 7 cervical vertebrae, 12 thoracic vertebrae, 5 lumbar vertebrae, 5 sacral vertebrae, and typically 4 coccygeal vertebrae. Muscles are the power source that drives various tasks and maintains human postures. The design of work tools should strive to minimize muscle fatigue, and this requires a thorough understanding of human muscles and bones. Work tools should be designed to match the anatomical characteristics of the human body. The musculoskeletal limitations of humans in working postures are illustrated through Figure 1-2.

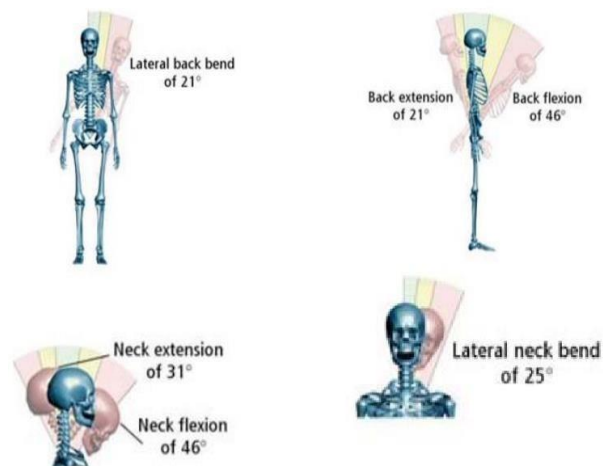


Figure 1. Range of motion limitations of the neck and back (*Guastello 2014*)

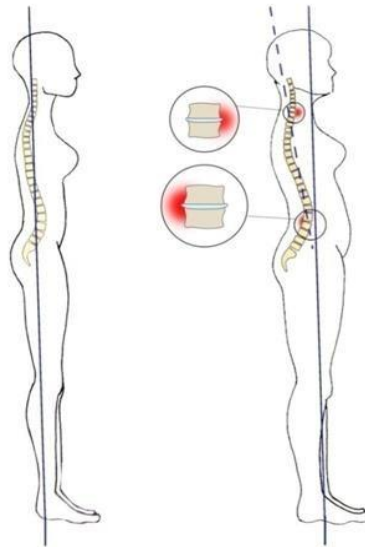


Figure 2. Spinal injury due to improper body posture (*Guastello 2014*)

We conducted a survey with a group of 15 sanitation workers. The workers were all male and within the working age range of 22-55 years old (see Table 1). They had work experience ranging from 2 to 20 years. However, the workers had not received any training on proper procedures for loading garbage into collection bins. Workers frequently bend forward to pull the trash bin, and then bend down to lift and lower the bin. The task is repeated every 5 minutes. Workers must lift the trash bin to an awkward position relative to their body structure to perform the emptying task. The height of the worker and the work support equipment is also not suitable.

Table 1. Demographic information of respondents

Age		Number
	22-39	10
	40-55	5
Level of education		
	None	0
	Secondary school	15
Duration of employment		
	<3 years	3
	3-6 years	5
	>6 years	7
Working duration per day (hours)		
	4	6
	8	9
	12	0

3. DISCUSSIONS

By examining the musculoskeletal structure and human movement capabilities, we can identify factors that can affect the musculoskeletal system during sanitation workers' movements, as discussed in the following article (Nguyen et al. 2020). Waste collection tasks require workers to lift trash bags from curbs (vertical bag handle height approximate 80 cm) and deposit them into a waste hopper at the back of the cart at a handle height of 120 cm. When collecting trash bags, workers typically carry one bag in each hand, but they may lift to four bags at a time. If the package is too bulky or heavy, they usually lift it with both hands. The average weight of a trash

bag is 8 kg, with a maximum recorded weight of up to 30 kg; however, this varies considerably. Workers perform approximately 2 lifts per minute, lifting two bags on average per lift. Workers typically toss the bags into the waste hopper instead of walking all the way to the truck. Workers are also responsible for collecting oversized and bulky waste items. This waste collection task poses significant musculoskeletal risks due to several factors. Firstly, some workers may be unable to perform the task safely due to exceeding their calculated strength capacity. Secondly, the high back load during lifting significantly increases the risk of injury. Additionally, the weight of the garbage bags often exceeds the maximum permissible limit, further exacerbating the risk. Furthermore, the bags are frequently positioned outside the acceptable lifting zone, necessitating awkward postures that strain muscles and increase injury risk. Moreover, the high frequency of lifting motions can lead to muscle fatigue, potentially compromising proper lifting technique and increasing injury risk. Finally, the repetitive and awkward postures required for the task place excessive strain on muscles and joints, further elevating the risk of musculoskeletal injuries.



Figure 3.

High backloads increase the risk of spinal injury. Biomechanical human modeling highlights concerns about spinal loading and worker strength limitations to perform the job (Guastello 2014). Lifting garbage bags places high loads on the back exceeding the action limit. These high spine loads increase the risk of injury for some workers.

"The risk assessments of sanitation workers' tasks suggest several measures that managers can implement to minimize the identified risk levels. Firstly, thorough training should be provided to workers. This should involve explaining proper work procedures to avoid incorrect and unscientific approaches that can lead to varying risk levels. Secondly, lower-height truck containers should be used to reduce worker fatigue during the process of emptying trash bins into the container. Figure 2 illustrates how lower truck containers can minimize hand lifting and, consequently, reduce the need for twisting and bending the back during this task. During rainy months, workers should be instructed on essential techniques to reduce lifting weight as rainwater accumulation in trash bins increases the lifting load. Thirdly, work pressure on sanitation workers should be alleviated by establishing standard work quotas and task durations for each route, ensuring an equitable distribution of workload. Finally, additional assistive lifting devices should be designed and implemented to minimize lifting forces for workers. These devices, employing a lever mechanism, can effectively reduce lifting heights and forces.

4. CONCLUSIONS

This article reflects the working conditions of waste collectors in Da Nang, Vietnam. This work requires workers to use their strength to lift waste. Poor working postures can lead to musculoskeletal injuries, including neck injuries from excessive head flexion, shoulder injuries from lifting heavy objects with improper posture, and back injuries from lifting heavy objects with improper posture. Additionally, surveys have shown that workers lack the necessary knowledge to

ensure occupational safety. A thorough study of workers' anthropometric characteristics is necessary to establish standard work procedures for waste collectors. Trash bins are often not of uniform size, and their weight can vary greatly depending on the type of waste, whether dry or wet. Therefore, to minimize spinal injuries among workers, it is necessary to provide additional lifting and lowering assistance equipment. Workers should have work time standards to ensure a fair distribution of work. There should be breaks to allow for physical recovery during long workdays with a high frequency of work, with an average of 3 minutes spent lifting and moving waste.

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APPLICATION OF STRATEGIC MANAGEMENT PRACTICES BY HOTEL STRUCTURES IN THE REGION OF SARANDA, ALBANIA

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Abstract

Tourism stands as a vital sector for development in the Saranda region, with its economy intricately intertwined with the progress of this industry. Given this sector's pivotal role, effective and sustainable management of tourism-related structures becomes imperative for long-term growth and prosperity. This study aims to assess the adoption of strategic management practices among hotel establishments in Saranda. Extensive scholarly literature attests to the importance of strategic management in driving organizational progress and ensuring enduring success, particularly within the tourism sector.

Following a comprehensive theoretical exploration, drawing on diverse studies and frameworks, a structured questionnaire was employed as the primary research instrument. This questionnaire was administered to a sample comprising 105 hotels of varying sizes, facilitating a thorough examination of strategic management practices within the region.

Findings from the study reveal a notable discrepancy in the implementation of strategic management practices among the surveyed hotel structures. A significant proportion of respondents indicate limited familiarity with strategic principles, highlighting potential challenges such as the absence of trained professionals and organizational constraints. This underscores the need for targeted interventions aimed at enhancing strategic capabilities within the local hospitality sector.

The implications of these findings extend beyond the immediate scope of the study, signaling the importance of addressing systemic barriers to strategic management adoption. Strategies to bolster managerial competency and cultivate a conducive organizational culture are paramount in overcoming these challenges.

In conclusion, this study offers valuable insights into the strategic management landscape of hotel structures in the Saranda region. By shedding light on existing gaps and barriers, it provides a foundation for informed decision-making and targeted interventions aimed at fortifying the strategic capabilities of the local hospitality sector, thereby fostering sustainable growth and competitiveness in the region's tourism industry.

Keywords: Strategic management, strategic practices, Albania, tourism sector

Intraducion

Tourism has experienced significant growth in recent decades, facilitating accessibility of visitores to diverse destinations and cultures worldwide. This surge in visitation necessitates the development of infrastructural facilities to cater to the needs of travelers. Comprising

various interrelated sectors, the tourism industry operates within a global framework, with businesses such as hotels, restaurants, transportation agencies, travel agents, tour operators, gift shops, taxis, and guides among its key players.

Beyond these direct contributors to employment, ancillary sectors play a vital role in fulfilling tourists' needs, securing services, and meeting demands. These businesses, although not directly operating within the tourism sector, provide products and services integral to the tourist experience (Zaei, 2013).

One of the most important sectors of providing these services is accommodation. Accommodation is the basis of the tourism industry as it is an essential part of tourism services. Before deciding to travel to their preferred destinations, tourists look for a location where they can rest and relax during this trip (Poudel, 2013). So it is a physical place which enables the individual to shelter and rest during his visit to a certain destination.

The tourism industry and technological developments have made it possible for travelers to have a choice of a considerable number of accommodation structures and facilities. Accommodation types and structures vary in terms of size and facilities, but the main goal is to serve their customers.

The hotel sector plays an important role in developing countries not only in economic development, but also in poverty alleviation and job creation (Okumus, 2010). The economic impact of this sector varies from one country to another and depends on several factors including the availability of suitable materials and equipment, the availability of skilled personnel, the need for imported labor, and the level of various taxes that apply to the hotel or the tourist (Cain, 2012).

Accommodations must be promptly reserved, as any unsold units within the specified timeframe result in a permanent loss of selling opportunity. Guests must physically be present to enjoy the services offered by accommodation facilities, underscoring the inherent rigidity observed in hotel structures (Koja & Gorica, 2007). Because these services are immediately consumed, they cannot be transferred temporally or spatially, distinguishing them from goods that may be stored or relocated.

One of the characteristics of an accommodation structure that differs from other industries is the lack of reservation policy, those accommodation services that are not consumed immediately are considered as lost production (Bakiu, 2010). Lost income cannot be recovered for past days. Even in the other case when there is more demand than the hosting capacity, the clientele will leave because there is no way to be served. Therefore the demand for accommodation plays a vital role in its provision. Since demand cannot be maintained, maintaining accommodation supply and demand is one of the challenges of managing these structures (Cooper, Fletcher, Fyall, & Gilbert, 2008).

Literature Review

In the tourism industry, strategic management emerged as a field of study in the mid-1980s, which aims to develop studies in organizations operating in this field (Okumus, 2010). In the 1990s, globalization led to the emergence of network strategies, and strategic alliances became the reference points around which researchers developed the literature (Goeldner & Richie, 2009). This would translate into more effort and a resource-based perspective. Which would help in the conception of the characteristics related to the internal competencies of the organization that enable them to gain competitive advantages. From the 2000s, progress

continues using the knowledge perspective, with particular emphasis on corporate social responsibility (Okumus, 2010).

Today, organizations operate in an unpredictable and competitive environment (Koja & Gorica, 2007) (Barney J. et al., 2006), their aim is to maintain success by creating and providing higher value to customers, while adapting to this environment. Like any organization in other industries, those in tourism face major competitive obstacles and challenges (El-Said & ElMakkawy, 2017), due to the complex nature of this industry and their activity in global environments. This makes strategic management and its practices indispensable. Okumus in his book points out that strategic management can provide an important contribution to organizations in the tourism sector (Okumus, 2010), addressing competitive challenges, regardless of their type and size.

Accommodation structure, mainly hotels (Kapiki, 2012), as one of the main sectors of the tourism industry, are particularly emblematic of the competitive landscape within this sector. Fierce competition is one of the main challenges of the accommodation sector, since, if customers remain dissatisfied with the service in one hotel, they are allowed to choose among many other hotels to meet their needs (Chen, 2010).

Based on what we cited in the paragraphs above, it is clear that tourism organizations operating in today's business environment must implement contemporary strategic management practices for many reasons (Chen, 2010). First, hotel operations must use strategic approaches to technology adoption, which can allow them to respond to changes in customer expectations and needs caused by information technology and the Internet.

Second, the use of strategic management approaches can enable hotels to gain a competitive advantage over competitors. Due to the great expansion that this industry has had, as well as the important impact it has on the economies and developments of countries, there are a large number of researchers who develop their research in relation to certain topics. This industry also looks tempting for strategic management studies, as a field of particular importance in the management of organizations. Many researchers have brought their research in relation to various issues, practices and elements of strategic management, applied in organizations of the tourism industry.

Olanipekun describes strategic management as a necessary condition as it involves the development and formulation of strategies to face the ever-increasing competition in the tourism industry (Olanipekun W. D., 2015). This approach would ensure the survival and growth of these organizations in the long term. On the other hand, it will ensure that a competitive advantage is created so that the organization not only dominates the competition, but also leads it successfully in the changing environment. The study that this author presents proves that strategic management not only creates a competitive advantage, but also shows the way to increase organizational performance. Based on the findings of this study, it is recommended that strategic management practices require continuous monitoring and improvement if necessary.

Metodology

This study employed a mixed-method approach, incorporating both primary and secondary data. Theoretical frameworks from various authors, exploring the application of these practices across diverse destinations, were synthesized. Additionally, a questionnaire served as the primary instrument for data collection, with 106 surveys administered within hotel establishments of varying sizes. Data analysis involved processing responses through software, utilizing averages to address the research question.

To determine the sample size, the Taro Yamane formula was applied. Stratified sampling was adopted to accommodate the heterogeneous nature of the target population, categorizing different layers based on income (business size) as units for selection.

RESULTS

As we cited above the survey was conducted among 105 hotels of different size in Saranda. The questionnaire used for collecting data was organized in two sections. The first section requires for general data related with hotels, information of responders and knowledge on the concept of strategic management. The second section requires information about strategic management and its elements.

Table 1: General data collected from questionnaire

	Frequency	Percent	Cumulative Percentage
Annual revenue:			
Under 5 million ALL	28	27%	27
5-8 million ALL	24	23%	50
8-14 million ALL	23	22%	72
Over 14 million ALL	29	28%	100
Number of employees:			
Under 15 employees	81	78%	78%
16-30 employees	17	16%	84%
31-50 employees	5	4%	88%
Over 50 employees	2	2%	100%
Is your hotel a family business?			
Yes	88	84%	84%
No	17	16%	100%
If Yes, are you one family member?			
Yes	83	94%	94%
No	5	6%	100%
Are you familiar with the strategic management concept?			
Yes	76	72%	72%
No	29	28%	100%
The hotels were you work, draft strategic plans?			
Yes	53	51%	51%
No	52	49%	100%
If Yes, who drafts strategic plans?			
Administrator	10	19%	19%
Owners	19	35%	54%
Manager	18	33%	87%
Experts	7	13%	100%

The indicator that shows the size of the business is the annual revenue. Most of the interviewed businesses, precisely 28% of them, belonged to the ALL 5 million range and 25% of respondents belonged to the range 5-8 million ALL. This means that most of them are small business. According to the literature mentioned in the section above, in most cases small business does not have the resources needed to draft strategic planning and use strategic tools. Another demographic data collected was number of employees. According to respondents the major hotels included in the study, about 78% of them have fewer than 15 employees. Only 2% of them have more than 50 employees in their business.

To the question if their hotel was a family business, 82% of the respondents answered yes”, indicator which is related to the person interviewed who was either the owner or administrator of the hotel. In response of the question of whether the person completing the questionnaire is a family member, 78% answered “yes”. This figure is approximate to the answers to the above question, which means that family businesses in leading or management positions in their business employ family members.

The question whether they were familiar with the term of “strategic management”, the respondents answered that yes, 71% of respondents accept that were familiar with the strategic management concept, while only 49% of them stated that they drafted strategic plans. According the questions who draft strategic plans in their hotel, the responders admit that in 54% of them was the owner or administrator of the hotels. The results show that the quantity of their plans depend of the knowledge of the owners and they relatives.

Research question: Are strategic management practices applied by hotel structures in the region of Saranda?

According the above question, the respondents were asked to evaluate practices that represent different stages of the strategic management process. The results of these questions are presented in Table 2. Regarding the strategy formulation phase, it is important to note that this phase includes four sub-phases, namely the strategy formulation process, the mission statement, the vision statement and the objectives and goals. Analysis of respondent feedback showed that the measure of their use varied from practice to practice. The Strategy Formulation process has an average of 3.48 which is the highest application rate in this phase, followed by objectives and goals with an average of 3.41. However, it is essential to note that not all sub-phases demonstrate uniform implementation; where the Mission statement had the lowest measure of use. This value is in the range in which it indicates disagreement with the given questions. This means that respondents do not agree that they have a written mission statement

Even the vision statement changes by a very small amount. The answers have been neutral in terms of having a vision of the hotel, knowing it and trying to achieve it.

As for the strategy implementation phase, the overall implementation average was measured by calculating the averages of all variable values of this phase. From Table 2 it can be seen that the overall average of the application of this phase was high, which for all indicators recorded 3.47, where the average values for the indicators vary from 2.71 for the lowest application to 3.91 for the highest application.

Regarding the results of the application of the last stage of strategy evaluation and control, the table shows that the majority of respondents agreed with the use of strategy evaluation

practices, where the overall average for all indicators was 3.35, having average values for the indicators ranging from 2.5 for the lowest to 3.59 the highest value.

Table 2: Strategic management elements

Strategy management practices	Mean
Strategy formulation	3.48
Mission	2.56
Vision	2.77
Objectives and goals	3.37
Strategy implementation	3.47
Strategy evaluation/control	3.35

Regarding the answer to this question, the results of the last five questions of the first section also help us. The fact that 82% of surveyed businesses were family businesses and in 78% of cases the contact person was a relative of the family, shows that the level of application of strategic management methods and practices depends on their knowledge and skills. This is reinforced by the answers to the next questions, in which 49% of the respondents admitted that they draft strategic plans, as well as over 55% of these plans are drawn up by their owners. This proves once again what was quoted above.

Conclusion

Strategic management and its development stages are considered very important not only for organisation growth but also for helping them achieve competitive advantage. The literature helps us understand the importance of strategic management practices in the development and profitability of these organizations. Adopting a systematic approach to strategic management practices is instrumental for organizations to navigate and effectively address the challenges and threats present in their operating environments. By embracing structured methodologies for strategy formulation, implementation, and evaluation, organizations can streamline their operations, making them less complicated and more responsive to dynamic market conditions. Such an approach ensures a coherent alignment between organizational goals and actions, enabling proactive responses to emerging challenges and threats. Ultimately, by integrating strategic management practices into their operations, organizations can enhance their resilience and effectiveness in an ever-evolving business landscape.

More and more researchers are convinced that strategic management and its practices are vital to the long-term success of organizations. In recent decades, a large number of researchers have been interested in studying the effects of strategic management practices and elements in different areas of business.

The results of the study showed that the accommodation structures in the Saranda region did not agree that they had a written mission and vision.

- Regarding the use of these practices, the study again showed that the measure of their use varied from practice to practice, where the lowest measure of use was the mission statement with an average use of 2.56, Table 2, which shows a their low usage as this value is

in the range in which it indicates inconsistency with the given questions. Appellants do not agree that they have a written mission statement.

- To a very small extent, the vision statement 2.77 also changes, which is located in the interval of the neutral zone (2.6-3.4). Again this shows that the respondents gave negative answers regarding the use of these practices. The answers have been neutral in terms of having a vision of the hotel, knowing it and trying to achieve it.
- Continuing with the establishment of objectives and goals which are also located in the neutral range, to finally move to the formulation of the strategy which is located in the range of agreement (I Agree) with a value of 3.48.
- Regarding the use of these practices, the study again showed that the measure of their use varied from practice to practice, where the lowest measure of use was the mission statement with an average use of 2.56, Table 2, which shows a their low usage as this value is in the range in which it indicates inconsistency with the given questions. Appellants do not agree that they have a written mission statement.

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**UNVEILING THE UNTOLD: THE IMPACT OF COVID-19 ON MARGINALIZED
GROUPS IN INDIAN CINEMA**

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Abstract

The global outbreak of Covid-19 has unearthed deep-seated disparities prevalent in societies worldwide, with India being no exception. This paper delves into the impact of the pandemic on marginalized communities within the vibrant Indian film industry. Despite India's renowned cinematic heritage, marginalized groups, including lower castes, religious minorities, tribal communities, and the economically disadvantaged, have long been misrepresented or entirely overlooked in mainstream cinema. This absence perpetuates stereotypes and reinforces social hierarchies on the silver screen. Against the backdrop of the Covid-19 crisis, this essay critically analyzes the marginalization of these communities in Indian cinema. It explores the reasons behind their lack of representation, examines the consequences of such exclusion, and suggests pathways toward fostering more inclusive storytelling. Despite the substantial influence of Indian cinema, the voices and stories of the most vulnerable sections of society remained conspicuously absent during the pandemic, raising questions about the industry's responsibility in reflecting societal realities. Through this examination, we aim to stimulate discourse, catalyze change, and advocate for a more equitable and just cinematic landscape in India. By shedding light on this issue, we seek to inspire filmmakers, industry stakeholders, and policymakers to embrace diversity and promote narratives that authentically represent the rich tapestry of Indian society, particularly in times of crisis.

Keywords: Covid-19 Pandemic, Indian Cinema, Marginalized Groups, Social Justice, Representation

INTEGRATION OF 'DESIGN FOR SUSTAINABILITY' IN DESIGN EDUCATION: PATTERNS AND TRENDS IN CURRICULAR APPROACHES"

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Abstract

This study synthesizes the data collected within the scope of the literature research of the thesis titled "Circular Design in the Context of Graphic Design Activism and Its Impact on Design Education." The research delves into the dynamic shift from conventional eco-design paradigms towards sustainable design frameworks, contextualizing the evolution from environmental consciousness to holistic sustainability considerations and from singular "product design" to comprehensive "system design" methodologies in recent years. The main goal is to explore the prevalence of sustainable design practices in design education while identifying common threads among programs integrating these concepts into their curricula. Through a comprehensive review of relevant academic programs, this research highlights the emerging nature of sustainable design education, emphasizing the need for greater integration within conventional design teaching methodologies.

Keywords: sustainability, design, design education

INTRODUCTION

Design, long under scrutiny for its role in the traditional 'take-make-use-dispose' pattern of global consumption, is now at a critical juncture, aiming to shift towards sustainability. As a result, the integration of sustainability into design education has become increasingly important.

In December 2002, prompted by the United Nations General Assembly's announcement of the "Decade of Education for Sustainable Development" starting January 1, 2005 (UNESCO, 2002), the United Nations Economic Commission for Europe introduced the "Education for Sustainable Development Strategy" (UNECE, 2005). However, literature and documented experiences regarding sustainability in Graphic Design education are limited (Dritz, 2014). This highlights concerns about graphic designers' slow adoption of sustainability, emphasizing the urgent need to explore ways to foster sustainable practices in education for innovative solutions.

This study examines the prevalence of sustainable design initiatives in design education and identifies common patterns across programs integrating sustainability into their curricula. Specifically, it seeks to align with six of the United Nations' seventeen sustainable development goals, as Bonsu, Chisin, and Cronjé (2020) outlined. The investigation encompasses transitioning from conventional eco-design to sustainable design, shifting from an environmental focus to a broader sustainability perspective, and moving from traditional 'product design' to holistic 'system design' approaches in recent years. Thus, the study seeks to shed light on the evolving landscape of Graphic Design education amidst the imperative of environmental sustainability.

CONCEPTUAL FRAMEWORK

The study is related to design education and aims to explore the context of sustainable design. It briefly highlights some gaps in the literature on eco-design education while outlining a framework of core competencies. It aims to discuss how mainstream design education can integrate it.

Shifting Environmental Focus to Sustainable Context In Design

The evolution of the field of Sustainable Design has expanded into three pillars of sustainability over the years, both theoretically and practically, depending on the changes taking place on a global scale.

While new economic contexts require the development of new competencies in terms of design management, innovation, design thinking, service, and strategic design (Brown, 2008; Manzini, 2015), new social contexts mean new competencies in terms of transformation and participatory design and user-centered design (Norman, 2013; Sangiorgi & Prendiville, 2017). New environmental contexts mean designers require new competencies in eco-design, sustainable innovation, and responsible design (Papanek, 1985; Thackara, 2005). This new design approach aims to affect the entire system, from the physical product to the socio-technical level, thus redefining design as a field, process, and attitude (Buchanan, 1992).

In the literature, improving the environmental and social performance of products and services is often described using terms such as eco-design, green design, sustainable design, and design for sustainability. These concepts underscore the necessity of considering the entire lifecycle of a product, from raw material extraction through manufacturing, distribution, usage, and end-of-life disposal (Manzini, 2015). This holistic approach identifies and mitigates environmental and social impacts at each stage, embedding sustainability benefits and facilitating remanufacture and reuse (McDonough & Braungart, 2002). In this context, designers must adapt their practices and thinking, directly impacting design education.

Approaches to Incorporating Sustainability into Mainstream Design Education

Debates about how to best incorporate sustainability into design education typically revolve around what constitutes effective design education, the role of higher education in society, and the skills and qualifications provided by universities (Gough & Scott, 2009).

In the UK, sustainability is well-integrated into design education. Undergraduate modules specifically focus on sustainability, and several leading international universities offer postgraduate courses in this area. The main question is whether sustainability should be embedded within mainstream design curricula or offered as separate modules in postgraduate programs.

The UK Higher Education Academy reports that research has revealed four main barriers to the successful embedding of sustainability across many subject disciplines in higher education (Sterling & Witham, 2008): Overcrowded curricula, Perceived disinterest by academic staff, Limited staff awareness and expertise, Limited institutional drive and commitment.

Various researchers have explored other perspectives on this challenge. Dewulf (2009) draws on experiences from three European degree programs in Belgium, the Netherlands, and Norway to examine how sustainability can be truly integrated into a program beyond a single module. Similarly, Eyto (2013) investigated the impact of integrated teaching on the professional careers of designers and engineers across multiple programs. In addition, Wever (2015) explored how the skill set required for sustainability differs from traditional design by gathering insights from educators on teaching a circular economy perspective to designers based on the experiences of various institutions.

There is evidence that design plays a crucial role in equipping graduates with sustainable literacy as an integral part of their undergraduate skills (de Eyto, 2010). However, many educators hold differing views on how to implement this topic effectively. One of the most radical views is redesigning the curriculum to support sustainable development (Mulder et al., 2012).

Sustainability in Graphic Design Education

Changes in design, which hold a leadership role by encompassing various disciplines, are transformative in fields such as Industrial Design, Textile, and Fashion Design. This transformation is driven by qualities such as design thinking, systems thinking, integrativeness, and human-centeredness.

Graphic design, previously criticized for promoting widespread consumerism, misunderstandings, and excesses in contemporary society (Papanek, 1985), is evolving. Traditionally focused on using text and images for communication, it is now embracing more action-based processes and experiential or system-oriented design solutions (Triggs, 2011).

From a sustainability perspective, graphic designers need to incorporate sustainability into both upstream activities, such as promoting products and services through concepts aligned with marketing plans, and downstream activities, including considering materials, production, and distribution of products (McDonough & Braungart, 2002).

While the field of graphic design has managed to keep pace with transformations in the product life cycle by adopting sustainability principles in production methods and using materials such as recycled paper stocks and less harmful inks and adhesives (Madge, 1997), the practice of sustainable graphic design is still in its infancy. Dritz (2014) highlights that despite these efforts, there remains a significant sustainability gap in the field.

Achieving true sustainability in graphic design requires a fundamental shift in practices. In educational institutions, this requires a shift from traditional production line models to more engaging and experiential methods that integrate sustainability into everyday actions (Reed, 1997). The current educational vision for sustainable design extends beyond raising awareness about ecological issues and climate change. It encompasses social, environmental, and economic issues, encourages critical thinking, tests ideas of sustainable technology, and explores the contradictions inherent in sustainable living.

Evaluating these perspectives reveals that the concept of sustainability needs to be addressed in graphic design education both within our country and globally. Given that education involves the transfer of knowledge, faculty members in graphic design departments should incorporate sustainability into their curriculum, particularly emphasizing the content of packaging design courses.

Graphic Design Education for Sustainability in Turkey

To overcome these obstacles, some universities in Türkiye have taken proactive steps to integrate sustainability into their design curricula (see Table 1). For instance, at Hacettepe University ((Hacettepe University, Faculty of Fine Arts, Department of Graphics, n.d.), sustainable graphic design is offered as an elective course in the second semester. This course covers a wide range of topics, from the introduction to sustainability to eco-design application proposals, encompassing discussions on solutions for sustainability in print material production and international sustainability debates.

Haliç University (Haliç University, Faculty of Fine Arts, Department of Graphic Design, n.d.) offers a required course on sustainability and design in the fifth semester, emphasizing design theories, life cycle thinking, social responsibility, and systems thinking. The course aims to integrate sustainability into various aspects of design education, preparing students for the challenges they will face in their professional careers. Additionally, to deepen the sustainability and design course, Haliç University offers a circular economy and design course as an elective in the sixth semester.

University*	Course Title	Type of Course	Semester	Credit/ECTS
Hacettepe Uni.	Sustainable Graphic Design	elective	2	3T2P / 9
Haliç Uni.	Sustainability and Design	required	5	3T0P / 4
İstanbul Gelişim Üni.	Sustainable Design	elective	5	3T0P / 4

* Within the scope of the Faculty of Fine Arts, Graphic Design Department, the courses related to the concept of 'Sustainability' at the undergraduate level and their contents weretaken into consideration.

Istanbul Gelişim University (Istanbul Gelişim University, Faculty of Fine Arts, Department of Graphic Design, n.d.) also includes a required course on sustainable graphic design in the fifth semester. This course covers topics such as the historical development of sustainability, environmental externalities, market failures, and green economy practices. By integrating these diverse topics, the course provides students with a comprehensive understanding of sustainability's role in design.

These attempts and examples from Türkiye illustrate how different institutions embed sustainability into their curricula, offering valuable insights into effective educational strategies. By incorporating sustainability into their courses, these programs equip future designers with the knowledge and skills to address environmental and social challenges through innovative design solutions. However, while these efforts are commendable, they are not sufficient on their own.

There is still a need for a more comprehensive and widespread integration of sustainability principles across all levels of design education. To fully address the sustainability gap in design education, more significant institutional commitment, enhanced staff awareness and expertise, and continuous curriculum updates are essential.

METHOD and CASE SELECTION

A three-stage method was implemented, including case selection, analysis, and interpretation of results. The sample group of design educational institutions was selected based on three main criteria: the inclusion of all educational levels (undergraduate, master's, and doctoral programs), the focus of the programs (irrespective of specific design areas, selected based on their titles and content), and the geographical location of each institution, considering the global origins of Sustainable Design.

The sample group of design educational institutions was selected based on three main criteria. The first criterion included all levels of education, acknowledging that Sustainable Design is now integrated into design practice and education. Therefore, this study encompassed not only graduate-level (master's and doctoral) programs that provide specialization but also undergraduate-level samples. The second criterion was the program's focus; programs were chosen based on their titles and content, regardless of specific design areas. The third criterion was the geographical location of each institution, recognizing Sustainable Design in developed countries through the influence of design and designers on society and industry.

The primary research method was qualitative content analysis, using keywords such as design, sustainable design, and design for sustainability.

Although some relevant institutions and programs may have been overlooked, the programs included in this study are deemed sufficient to draw meaningful inferences.

Our data analysis led to the identification of several vital codes, including circular economy, eco-system innovation, design thinking, systemic design, and holistic understanding. These codes helped us pinpoint the themes that reflect the focus areas of sustainable design education programs, highlighting the diverse approaches. By examining the specific focus areas, we identified how different aspects of sustainability are addressed within these programs, providing insights into the educational strategies employed to incorporate sustainability into design education.

This research aimed to explore the integration of sustainability into design education programs across various universities and to identify common points and trends between programs.

We employed a general survey model to describe current practices in design education, focusing on sustainable design. Data collection was carried out using document analysis, a technique that involves summarizing existing data, categorizing it to make sense of critical variables, and allowing for comparison and transformation into a standardized form (Karasar, 2014; Ekşioğlu et al., 2014).

A three-stage method was implemented, including case selection, analysis, and interpretation of results. The sample group of design educational institutions was selected based on three main criteria: the inclusion of all educational levels (undergraduate, master's, and doctoral programs), the focus of the programs (irrespective of specific design areas, selected based on their titles and content), and the geographical location of each institution, considering the global origins of Sustainable Design.

Qualitative content analysis was used as the primary research method, employing keywords such as design, sustainable design, and design for sustainability. Through this analysis, we identified several critical codes representing the core elements of sustainable design education. These codes include circular economy, eco-system innovation, design thinking, systemic design, and holistic understanding. These elements were further refined into themes that reflect the focus areas of sustainable design education programs, highlighting the diverse

and innovative approaches employed by different institutions (see Table 2). By examining these focus areas, we identified how various aspects of sustainability are incorporated into design education, providing valuable insights into effective educational strategies.

Table 2. Sustainable Design Education Program Focus Areas (Themes)

University	Degree	Env. Issues	Econ. Issues	Soc. Issues	Sustainability	Circularity	System Thinking	Innovation
TUDelft Uni.	MD	✓	✓			✓		✓
	MD	✓	✓			✓	✓	
	MD						✓	✓
Aalto Uni.	BA	✓		✓	✓		✓	✓
	MD	✓		✓	✓		✓	✓
School of Sustainability	MD	✓	✓	✓	✓	✓		✓
Sustainable Design School	BA	✓			✓			✓
	PHD	✓			✓			✓
Linnaeus Uni.	BA	✓			✓		✓	
Autograph	BA	✓		✓	✓			
DAE Academy Eindhoven	MD	✓		✓	✓			
Norwegian Uni.	PHD	✓			✓			✓
Linköping Uni.	MD	✓			✓		✓	✓
Nuova Accademia	BA	✓		✓	✓			
	MD	✓		✓	✓			
Design Academie Berlin	MD	✓		✓	✓		✓	

RESULTS and DISCUSSIONS

Analysis of design education programs revealed several key focus areas that highlight how sustainability is being integrated into design education programs across different institutions. The identified themes include environmental issues, economic issues, social issues, sustainability (directly addressed), circularity in design and economy, design and system thoughts, and innovation.

Environmental issues emerged as a prominent focus area, with a significant number of programs (15 out of 20) incorporating sustainability into their curriculum. This finding underscores the widespread recognition of the urgent need to address environmental challenges within the design field.

Interestingly, while environmental sustainability receives considerable attention, economic and social sustainability aspects are less emphasized. Only a few programs (3 out of 20) specifically address economic sustainability, indicating a potential gap in integrating economic principles into design education. Similarly, social issues are addressed in a smaller subset of programs (7 out of 20), suggesting room for improvement in incorporating social sustainability considerations.

An encouraging finding is the explicit integration of sustainability principles into the core teachings of several programs. Eleven of twenty programs have taken proactive steps to embed sustainability into their curriculum, indicating a strong commitment to fostering sustainable design practices among students.

Furthermore, the analysis revealed specific thematic focuses within the realm of sustainability. Circular economy principles are explored in a select few programs (3 out of 20), highlighting a growing awareness of the importance of resource efficiency and waste reduction in design. Similarly, systemic design thinking is integrated into a subset of programs (5 out of 20), emphasizing holistic approaches to addressing sustainability challenges.

Innovation emerged as a key focus area, particularly in programs emphasizing design thinking methodologies. Eight out of twenty programs prioritize innovation, underscoring the crucial role of creativity and forward-thinking in developing sustainable design solutions.

These findings suggest that while there is a strong emphasis on environmental sustainability in design education, there is an opportunity for further development in incorporating economic and social sustainability aspects into curricula. Moving forward, educational institutions should explore innovative approaches to sustainability integration, ensuring that future designers are equipped with the necessary skills and mindset to address complex global challenges effectively.

CONCLUSION

Our study offers valuable insights into trends and tendencies in design for sustainability education. Although environmental sustainability is a clear focus, there is room for improvement in integrating economic and social sustainability aspects into design curricula. Educational institutions should explore innovative approaches to sustainability integration in design education, preparing future designers to address complex global challenges effectively.

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**DESIGN AND IMPLEMENTATION OF OPTIMIZING PHOTOVOLTAIC POWER:
M.P.P.T COMPARISON BETWEEN - PERTURB AND OBSERVE (P&O) VS PARTICLE
SWARM OPTIMIZATION (PSO)**

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Abstract

In recent years, the prominence of renewable energy has grown significantly, with a focus on various sources such as hydro, solar, marine waves, and wind energy. Among these, solar energy, harnessed through photovoltaic (PV) systems, stands out as a crucial and evolving domain in power generation. The selection of an appropriate Maximum Power Point Tracking (M.P.P.T) technique is pivotal for optimizing the performance of PV systems. This study addresses the need for accurate and efficient power generation by comparing two widely used M.P.P.T techniques: Perturb and Observe (P&O) and Particle Swarm Optimization (PSO). Utilizing historical data and performance metrics, the study evaluates the effectiveness of each technique in maximizing power output. The analysis extends to considerations of system efficiency, response time, and adaptability to varying environmental conditions. By employing a comprehensive comparison, this report aims to provide insights into selecting the most suitable M.P.P.T technique for enhanced photovoltaic power generation.

An investigation of the financial effects of applying Particle Swarm Optimization (PSO) and Perturb and Observe (P&O) techniques has been included to expand the research's purview. This entails investigating the upkeep needs for every technique and performing thorough cost-benefit assessments. An analysis of new developments in the sector and their prospective effects on PV systems in the future serves to further support this inclusive viewpoint. The main objective of this extensive study is to offer useful information to decision-makers so they may choose a Maximum Power Point Tracking (M.P.P.T.) approach that maximizes solar power output in a way that is both competitive and economically feasible.

Keywords: Perturb and Observe (PO); Particle Swarm Optimization (PSO); Photovoltaic Systems; Maximum Power Point Tracking (M.P.P.T)

INTRODUCTION

Since the middle of the 1990s, there has been a movement toward renewable energies that seems to be becoming stronger every year. The five elements—earth, water, air, fire, and sun—are the main sources of these energy, which have been utilized by humans for the longest time. Since the beginning of time, renewable energy has been utilized because they are endless. These days, the term "renewable energies" covers a wide range of industries whose use does not result in the depletion of the original resource. Electricity is produced via renewable energy sources.

The decentralized production of electricity through renewable energy sources offers greater supply security for consumers while respecting the environment. However, the unpredictable nature of these sources requires us to establish rules for the design and use of these systems to exploit them to the fullest.

In this chapter, we will extend our exploration to the domain of photovoltaic systems, specifically focusing on the optimization of power generation. Our study delves into the critical aspect of Maximum Power Point Tracking (M.P.P.T) techniques, aiming to evaluate and compare the effectiveness of two widely used methodologies: Perturb and Observe (P&O) and Particle Swarm Optimization (PSO). The examination considers their performance in enhancing power output, system efficiency, and adaptability to varying environmental conditions. This investigation is vital in navigating the complexities of harnessing solar energy efficiently.

Researchers worldwide have developed a plethora of M.P.P.T algorithms to extract maximum power from PV panels. These algorithms range from commonly used techniques such as Perturb and Observe (P&O) and Hill Climbing (HC) to more intricate approaches like the sliding control (SC) method. Notably, the comparison between traditional algorithms and global (M.P.P.T) (G.M.P.P.T) methods utilizing meta-heuristic algorithms, such as Particle Swarm Optimization (PSO) and Cuckoo Search (CUS), underscores the superior tracking performance of the latter. Additionally, innovative methodologies like the model-free spline-guided Jaya algorithm and temperature-based M.P.P.T techniques demonstrate efficiency under partial shading conditions and cost-effectiveness [1].

Enhancing Photovoltaic Power Generation Efficiency: A MATLAB Simulink-Based Comparative Study of M.P.P.T Techniques - Perturb and Observe (P&O) vs. Particle Swarm Optimization (PSO)"

PHOTOVOLTAIC SYSTEMS

In photovoltaic panel modeling, many solar or photovoltaic cells are modeled. These cells are made up of two semiconductor layers that come together to form a p-n junction. Light energy that is incident is absorbed by this junction and transformed into electrical energy. Table I illustrates this relationship between the production process and the efficiency of these cells by listing the major components and their respective efficiencies. The behavior of photovoltaic cells may be described by a variety of mathematical models [2].

A photovoltaic cell is shown as a current source parallel to a diode in simpler forms. On the other hand, a current source, a diode, and two resistors make up the model of the solar module used in this study. As seen in Fig. 1, these elements stand for the non-ideal properties of the cells. The parallel resistance shows the leakage currents (parasites) flowing through the solar module, whereas the series resistance accounts for the losses in the metal contacts of the module [3].

The mathematical formulation of a non-ideal model, as shown in [4], takes into account the solar cell's ability to generate current.

$$I = I_{ph} - I_r \left[e^{q(V+IR_s)/\eta kT} - 1 \right] - (V + IR_s)/R_D \quad (1)$$

In the above equations, I and V stand for the current and voltage at the solar cell's output terminals, I_{ph} for the photocurrent, I_r for the diode's reverse saturation current, and R_s and P for the parallel and series resistors. In addition, η is the p-n junction ideality constant, k is the Boltzmann constant (1.3806503 x 10⁻²³ J/K), T is the ambient temperature in Kelvin, and q is the electron charge (1.60217646 x 10⁻¹⁹C).

As explained in (2), the photovoltaic cell's temperature and the amount of solar radiation both affect the photocurrent I_{ph}. Moreover, (3) and (4), respectively, provide descriptions of the parameters I_r and I_{rr}.

TABLE1: Efficiency of photovoltaic cells

Technology	Efficiency (%)
Si (crystalline cell)	25.6 ± 0.5
Si (multicrystalline cell)	21.3 ± 0.4
Si (thin film minimodule)	10.5 ± 0.3
GaAs (thin film cell)	28.8 ± 0.9
Multijunction (Five junction cell)	38.8 ± 1.2

$$I_{ph} = [I_{cc} + \alpha (T - T_r)] \frac{G_{sum}}{1000} \quad (2)$$

$$I_r = I_{rr} \left(\frac{T}{T_r} \right)^3 e^{\left[\frac{qE_g}{\eta k} \left(\frac{1}{T_r} - \frac{1}{T} \right) \right]} \quad (3)$$

$$I_{rr} = \frac{I_{cc} - \frac{V_{ca}}{R_p}}{\frac{qV_{ca}}{\eta k T_r - 1}} \quad (4)$$

The IV and PV curves present non-linear behavior resulting from the equations of the mathematical model described, as shown in Fig. 2, respectively.

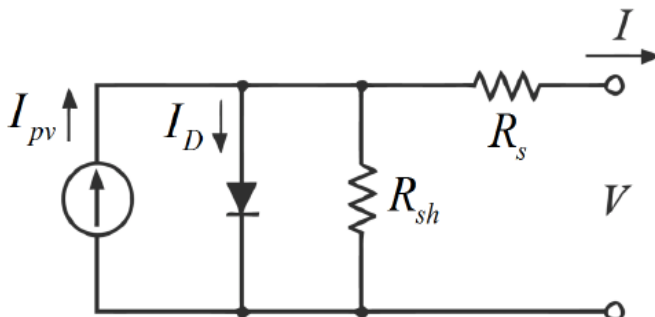


FIGURE1: Equivalent photovoltaic cell circuit characteristic curves IV and PV

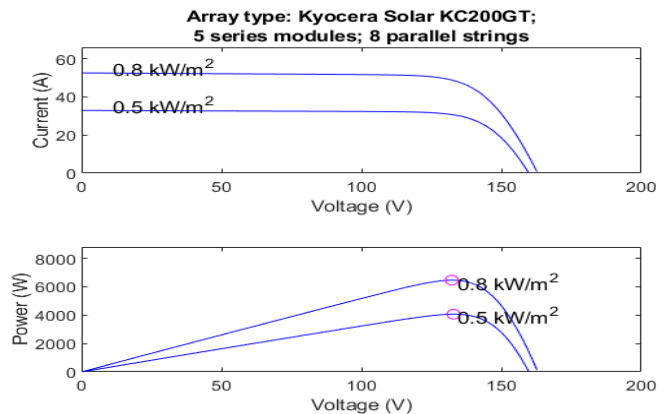


FIGURE2: The photovoltaic cell's characteristic curves IV and PV

PHOTOVOLTAIC POWER MAXIMUM POWER POINT TRACKING (M.P.P.T)

Maximum Power Point Tracking (M.P.P.T), sometimes simply referred to as Power Point Tracking (P.P.T), is a commonly used technique with wind turbines and photovoltaic solar systems (PV) to maximize power extraction under various conditions.

While solar energy is primarily covered, the principle generally applies to variable power sources such as optical power transmission and thermos photovoltaics.

The configuration of photovoltaic solar systems varies depending on whether they are connected to external grids, battery banks, inverter systems, or other electrical demands. The main obstacle to

Maximum Power Point Tracking (M.P.P.T.) is that power transfer efficiency from the solar cell depends on both the electrical characteristics of the load and the amount of sunlight that reaches the solar panels, regardless of where the solar energy is directed.

The load characteristic that guarantees the best power transfer efficiency varies in tandem with variations in sunshine levels. As a result, to retain the maximum energy output while maintaining optimal system efficiency, the load characteristic must be adjusted. The Maximum Power Point (M.P.P.) is the term used to describe this essential load feature.

M.P.P.T METHODS

There are methods for maximizing device performance to meet requirements even in the absence of prior knowledge about these points or understanding of the circumstances surrounding changes that had place. Maximum Power Point Tracking is the name given to this type of control (M.P.P.T). In order to enable the transmission of maximum power, the fundamental idea behind these directives is to find the maximum power point (M.P.P.) while maintaining ideal alignment between the generator and the load [5, 6].

Thus, we may conclude that variables like temperature, illumination, and panel location affect a solar panel module's output power. Additionally, it depends on the voltage times current ($V_{CELL} \times I_{CELL}$) product. Either the voltage or the current can be changed to enhance the power output."

PHOTOVOLTAIC POWER M.P.P.T (P&O)

The P&O algorithm is the most widely used in PV systems due to its simplicity and ease of implementation. As its name suggests, the P&O method is based on perturbing the system by increasing or decreasing the operating voltage of the PV module with a fixed step or by directly acting on the duty cycle of the DC-DC converter. Subsequently, its effect on the module's output power is observed [1]. As illustrated in Figure1, we can deduce that if a positive increment of the voltage V_{PV} results in an increase in power P_{pv} , it means that the operating point is to the left of the MPP. Conversely, if the power decreases, it implies that the system has surpassed the M.P.P on the other hand, a drop in power indicates that the system has exceeded the (M.P.P) [7].

Various maximum power point tracking (M.P.P.T) algorithms are proposed for photovoltaic (PV) applications, offering different levels of complexity and efficiency. The simplest method involves maintaining the PV array at a constant voltage, while the perturb and observe (P&O) technique, though slightly costlier, significantly improves energy efficiency. P&O perturbs the PV system's operating point and adjusts based on power variations, making it a widely used algorithm.

The P&O technique's disadvantage is that it loses some of its available energy when the operating point oscillates about the M.P.P in a stable (equilibrium) condition. Furthermore, the P&O algorithm responds as though the impact of the preceding disturbance is the reason for the abrupt rise in radiation. It deviates from the actual maximum power point as a result of continuing in the same direction, which is wrong [8] as shown in Fig. 3, Fig. 4 and Fig. 6

FIGURE3: System Approaches in P.P.M, V.P.P.M, and AP for P.P.M Communication

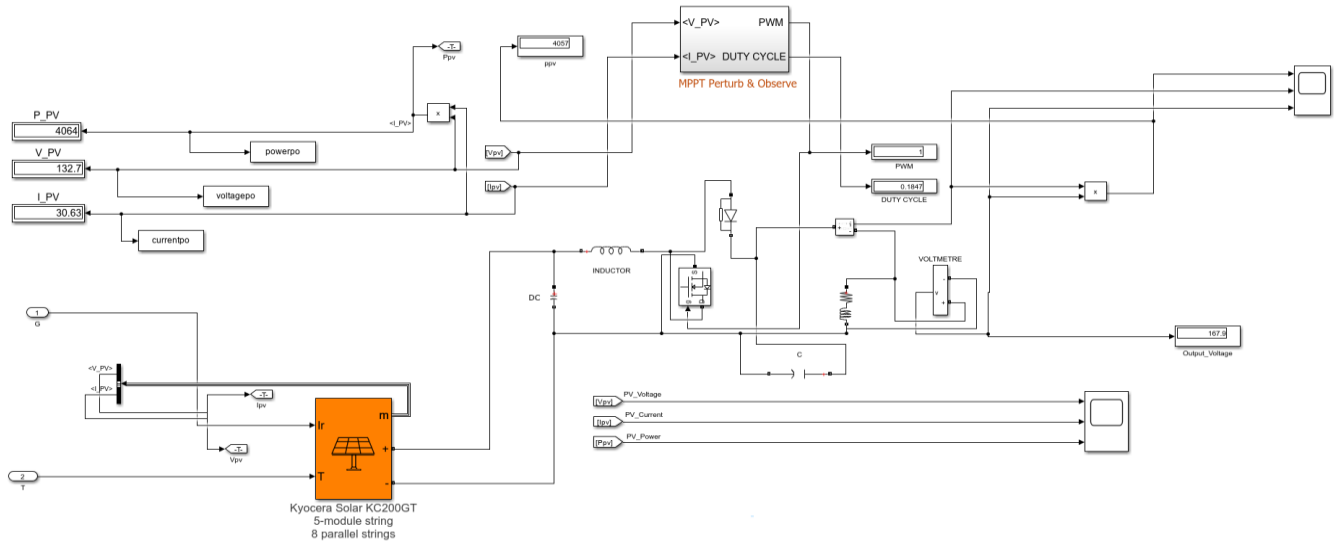


FIGURE4: Photovoltaic Power M.P.P.T Perturbation and Observation (P&O) method MATLAB Simulink

PHOTOVOLTAIC POWER M.P.P.T (PSO)

When it comes to photovoltaic (PV) systems, maximum power point tracking (M.P.P.T) algorithms, dealing with partial shade (PS) circumstances offers tremendous obstacles. During the search of the global maximum power point (G.M.P.P), these problems include things like becoming caught in local maximum power points (L.M.P.P), long tracking periods, and power swings. This research addresses these issues by presenting an improved PSO-based M.P.P.T method created especially for PS situations. First, a thorough examination of the stability and steady-state behavior of the conventional

PSO-MPPT approach under PS circumstances reveals its flaws. The requirements that must be met in order to obtain a steady reaction are then determined. Finally, a new method using two voltage bounds is shown for calculating the convex area of the power against voltage (P-V) curve. is presented, using two voltage limits to identify the GMPP. The suggested M.P.P.T technique's effectiveness is demonstrated by the experimental validation, which shows quick convergence and little variation in finding the G.M.P.P. The suggested M.P.P.T's adaptability to a wide range of PV inverters demonstrates its suitability for use in various PS scenarios [9].As shown in Fig. 5, Fig. 7

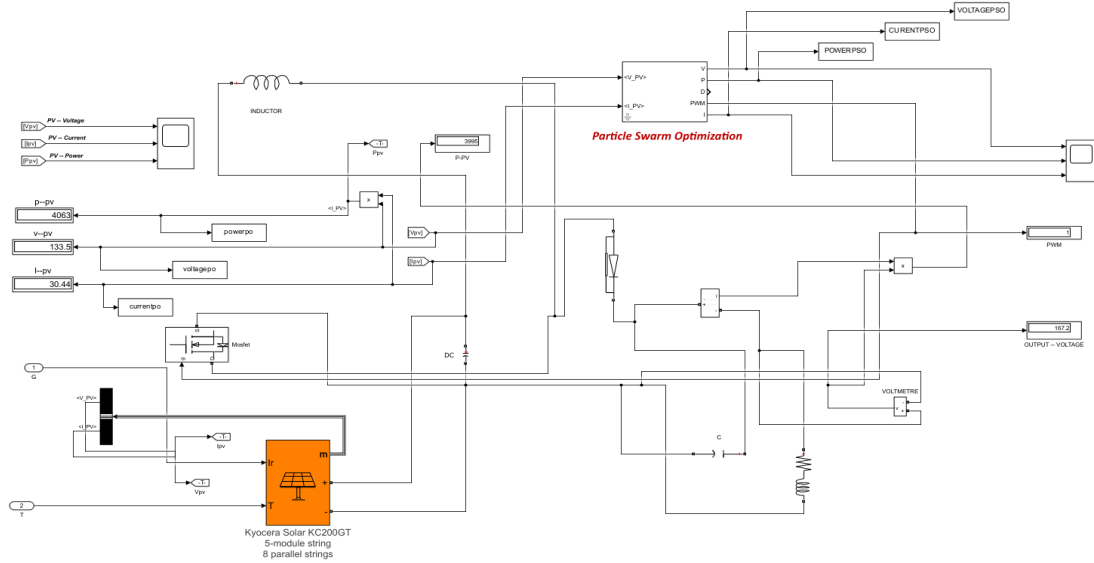


FIGURE5: Photovoltaic Power M.P.P.T Particle Swarm Optimization (PSO) method MATLAB Simulink

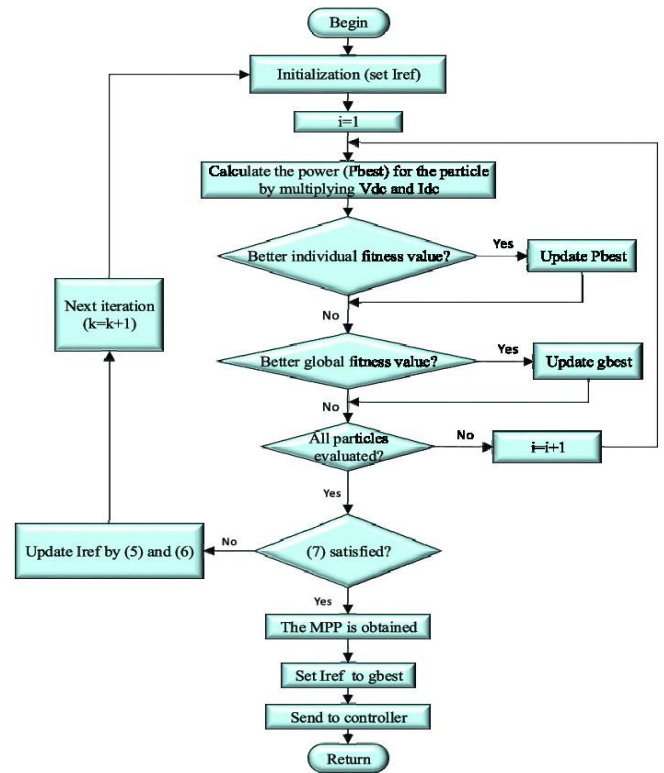
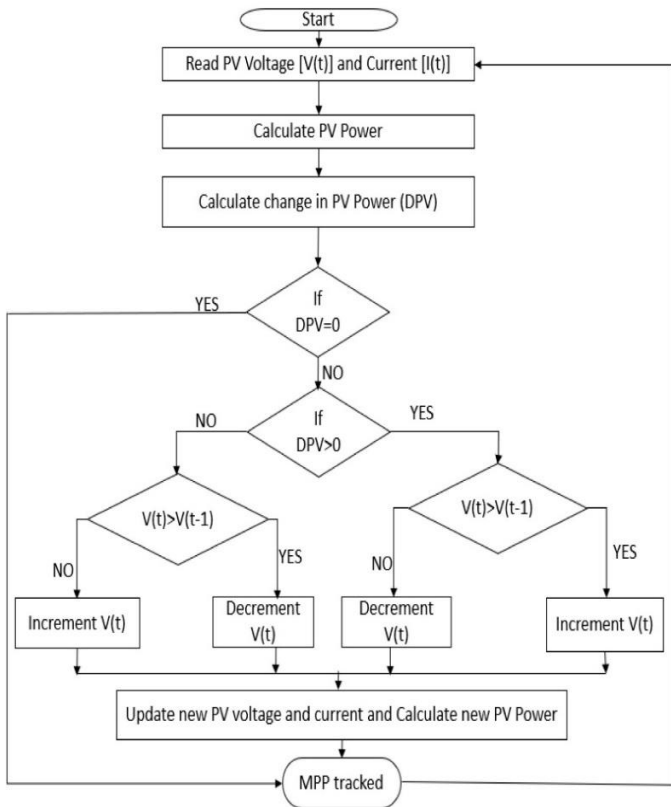


FIGURE6: Flowchart for the Perturb & Observe technique [11] **FIGURE7:** Flowchart for the Particle Swarm Optimization technique [11]

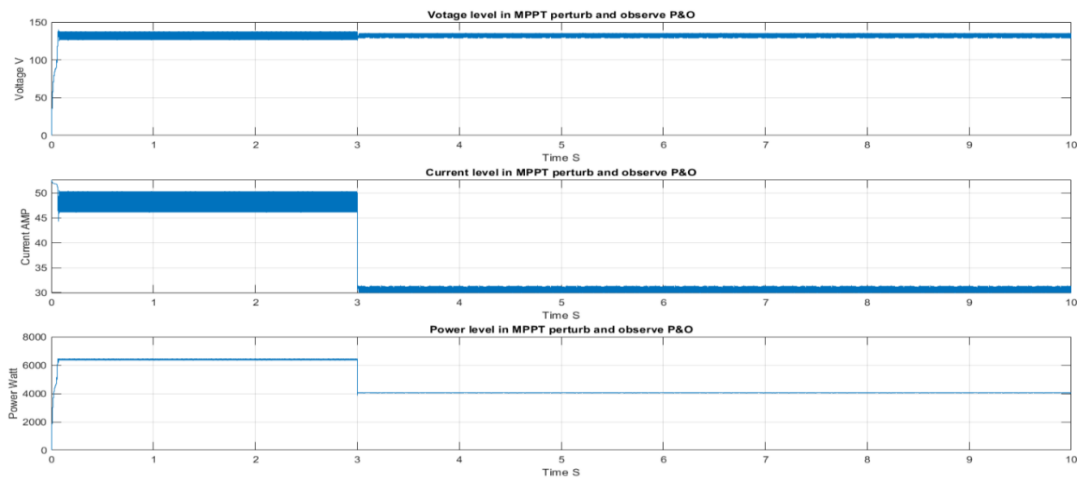
RESULT

Photovoltaic Power M.P.P.T Perturbation and Observation (P&O) and Particle Swarm Optimization (PSO)

1- Photovoltaic Power M.P.P.T Perturbation and Observation (P&O)

Upon the completion of our Simulink simulation, three distinct curves have materialized, each with a specific focus. The first graph intricately details the voltage dynamics, providing a visually insightful representation of its behavior. Following suit, the second curve succinctly captures the current flow within the system. The third, and notably crucial, curve reveals the intricate power characteristics. Importantly, these curves are specifically tailored for Perturbation and Observation (P&O) analysis in the Simulink environment. They play a vital role in deciphering the dynamic responses of the system under varying conditions. Together, these curves form a comprehensive analysis, unraveling the nuanced performance of the simulated system through the lens of P&O methodology.

Regarding the first figures of voltage, oscillations are observed. As for the power curve, there is a notable distortion of the waveform oscillation between 3950 to 4060 watt, as shown in Fig. 8, Fig.



9

FIGURE8: Voltage, current and power curves of in Perturbation and Observation (P&O)

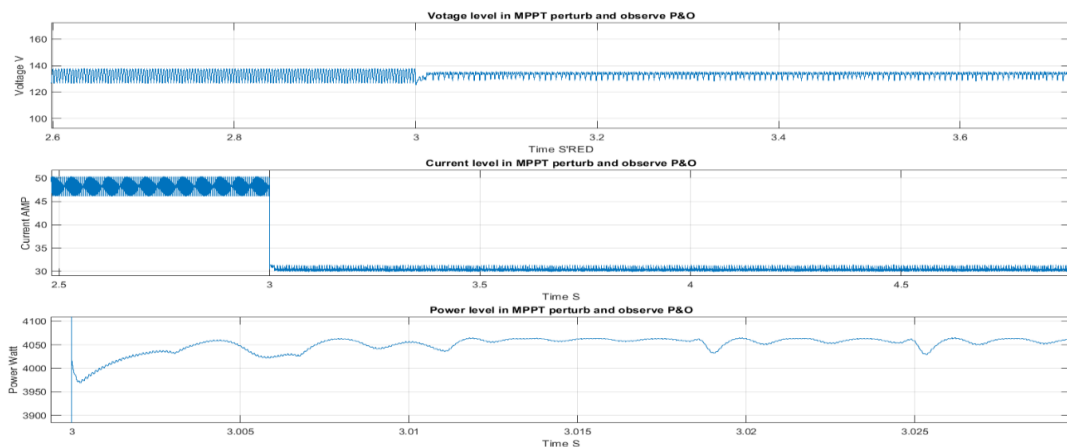


FIGURE9: A section showing the voltage, current, and power curves for disturbance and monitoring (P&O)

2- Photovoltaic Power M.P.P.T Particle Swarm Optimization (PSO)

The initial graph intricately details the voltage dynamics, providing a visually insightful representation of its behavior. Following suit, the second curve succinctly captures the current flow within the system. The third, and notably crucial, curve reveals the intricate power characteristics. Significantly, these curves are specifically tailored for Particle Swarm Optimization (PSO) analysis in the Simulink environment. They play a pivotal role in deciphering the dynamic responses of the system under varying conditions. Together, these curves form a comprehensive analysis, unveiling the nuanced performance of the simulated system through the lens of PSO methodology.

In the first voltage waveform, there is a notable distortion observed for both voltage and current during the initial fraction of a second. However, it subsequently stabilizes at the required level, coinciding with the stabilization of power at 4064 watts. Specifically, the voltage and current stabilizes approximately at 140 volts, and the current at 30 amperes, as shown in Fig. 10, Fig. 11

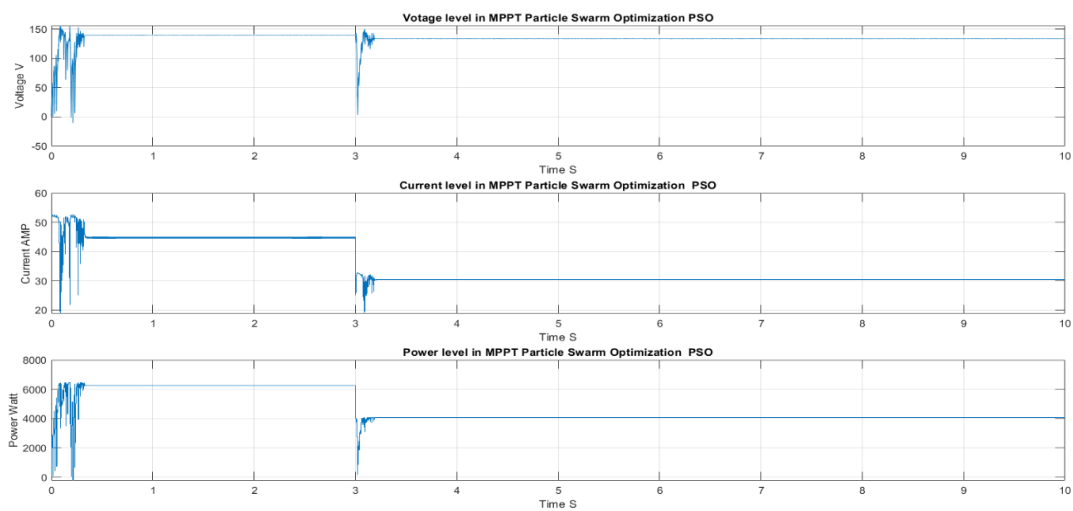


FIGURE10: Voltage, current and power curves of in Particle Swarm Optimization (PSO)

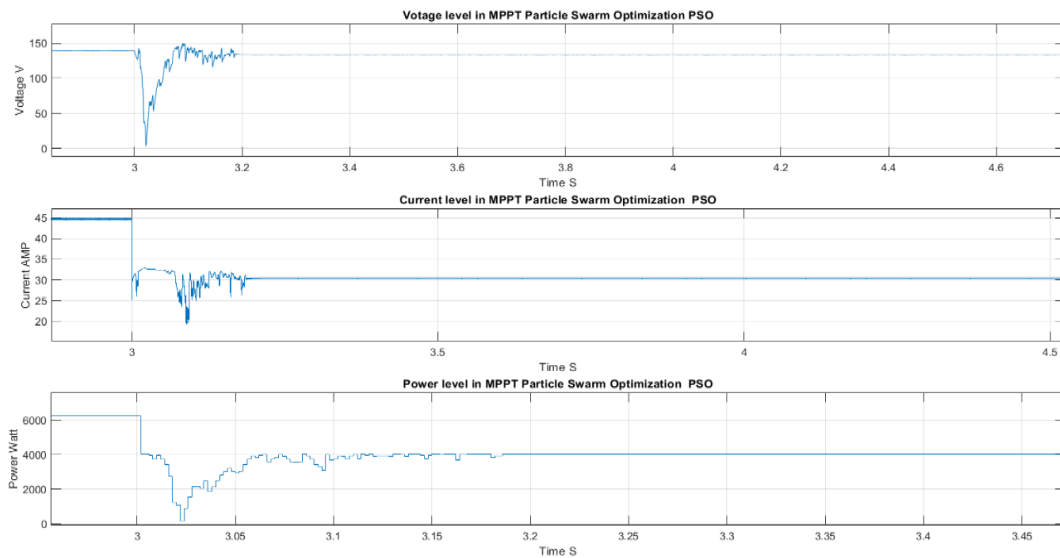


FIGURE11: A section showing the voltage, current, and power curves for Particle Swarm Optimization (PSO)

CONCLUSION

Research on photovoltaic (PV) systems' maximum power point tracking (M.P.P.T) algorithms, with a focus on issues related to partial shadowing (PS), has produced insightful findings and creative solutions. Improved PSO-based MPPT algorithm designed for PS scenarios shows a notable improvement in addressing problems such as being stuck at local maximum power points (L.M.P.P), long tracking times, and power variations while chasing the global maximum power point (G.M.P.P). The suggested method's efficacy is confirmed by the experimental validation, which highlights its small variance in G.M.P.P detection and fast convergence. Furthermore, this (M.P.P.T) technique's flexibility with different PV inverters emphasizes how versatile it is for a range of PS circumstances. This study advances the practical use of M.P.P.T techniques in addition to their improvement. This work advances both the practical use of solar energy in

difficult environmental circumstances and the improvement of M.P.P.T approaches. Conversely, the popular Perturbation and Observation (P&O) method has inherent limits, especially under steady settings and abrupt increases in radiation, while being known for its simplicity and convenience of use. The research reveals that during steady states, the algorithm has a propensity to bounce around the maximum power point (M.P.P), which wastes energy. Its reaction to sudden variations in radiation also differs from the real M.P.P, which makes it difficult to extract optimal power. Even while P&O is still a widely used MPPT approach, its shortcomings highlight the need for continued study and the investigation of other strategies to raise the effectiveness and dependability of PV systems even more. In the end, Power Oscillation (PO), noticeable voltage oscillations are evident in the initial voltage figures [10], accompanied by significant waveform distortion within the power curve ranging from 3950 to 4060 watts. Conversely, in the case of Particle Swarm Optimization (PSO), the initial fraction of a second in the first voltage waveform exhibits notable distortion in both voltage and current. Nevertheless, these variables stabilize at desired levels of around 140 volts for voltage and 30 amperes for current, aligning with the concurrent stabilization of power at 4064 watts.

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PROSPECTS AND PROBLEMS OF USING ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION

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Abstract

Artificial intelligence is at the heart of higher education today, transforming the process of learning, research and management. The presented work examines the problems of using artificial intelligence in modern higher education. The authors discuss the potential of artificial intelligence to optimize the teaching and learning process, the features of computer vision technologies in education, as well as the challenges that may arise due to the lack of specialists in this field. Nevertheless, based on various studies, the authors show that the introduction of artificial intelligence opens up great opportunities for education, provided that a balance is maintained between progress and traditional teaching methods.

Keywords: Artificial intelligence, high education, online learning.

INTRODUCTION

Artificial intelligence (AI) is at the heart of higher education today, transforming learning, research, and administration. One of the important reasons why the use of AI is becoming a necessity is its potential to teach and learn more effectively. Lots of information can be easily processed and analyzed by AI, allowing for the generation of customized tasks and materials. Each student can receive personalized feedback and a tailored approach, resulting in a better quality of education and better understanding of the curriculum.

AI has also played an important role in supporting research projects and scientific research. Automating the process of data analysis, detecting patterns, and modeling complex systems make the task of researchers easier. The time spent on data processing is reduced, allowing scientists to concentrate on the more creative aspects of research.

Artificial intelligence is also helping in strengthening the administrative work of higher education institutions. Automating routine tasks such as data science, scheduling, and monitoring progress saves time and resources. As a result, university staff can focus on more strategic tasks and create efficient workflows.

In addition, AI is driving the development of new technologies and innovations in higher education, opening up new opportunities to improve learning and assessment processes. The use of virtual and augmented reality, automated feedback systems and other tools enriches the educational process and contributes to the development of new approaches to education.

Artificial intelligence has become an integral part of modern higher education, making significant contributions to teaching, research, and administration. Its use increases the efficiency and quality of educational processes, reduces the time spent on research and administrative work, and also contributes to the development of new innovations.

THE ROLE OF AI

Artificial intelligence plays a significant role in preparing for the future job market. It is one of the key technologies that is already changing the modern labor market. The application of AI in higher education allows students to familiarize themselves with this technology, develop relevant skills, and gain a competitive advantage in the job market. In addition, the use of AI helps universities adapt to the changing needs of the labor market.

Research company HolonIQ conducted an international survey of organizations in the field of education to find out how artificial intelligence technologies are used in practice. The survey was conducted in two waves: in 2019 and 2022. A total of 464 respondents took part in the survey, which is a small but impressive sample.

The results of the survey showed that in the three years from 2019 to 2022, the number of respondents who successfully implemented AI-based solutions increased to 25% (Fig. 1). There are more people who plan to implement such solutions in the near future, and people who are not interested in this technology have disappeared. However, it was also revealed that some people who tried to implement AI in higher education were disappointed with the results and stopped using the technology. They noted that they expected more significant and rapid changes, and also did not take into account the need to invest more resources for the successful implementation of the project.

As for computer vision technologies, they have become important in education in recent years, primarily in proctoring systems. But they, along with voice assistants, are considered by respondents to be less important for learning.

Computer vision technologies have become relatively important, primarily in proctoring systems, which is reflected in surveys on the use of AI in education.

Respondents also consider voice assistants to be less important for learning. Studies have shown that experienced users of AI consider it to be most valuable in the field of assessment and feedback, as well as in the process of teaching and supporting students. They see the potential of AI to improve these processes (Figure 2).

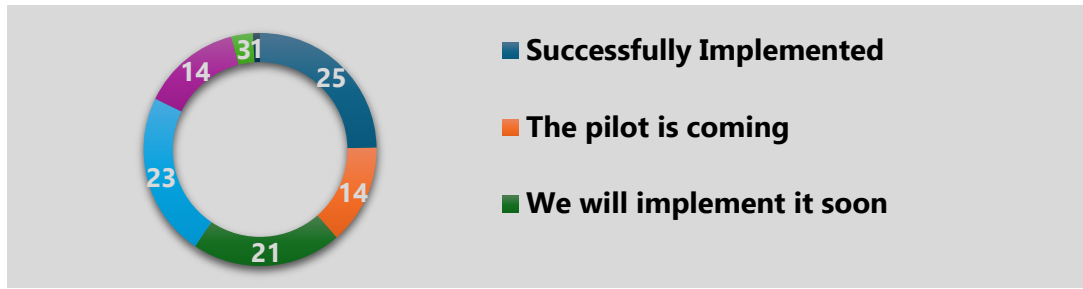


Figure 1. Results of the 2022 survey on plans for the introduction of artificial intelligence

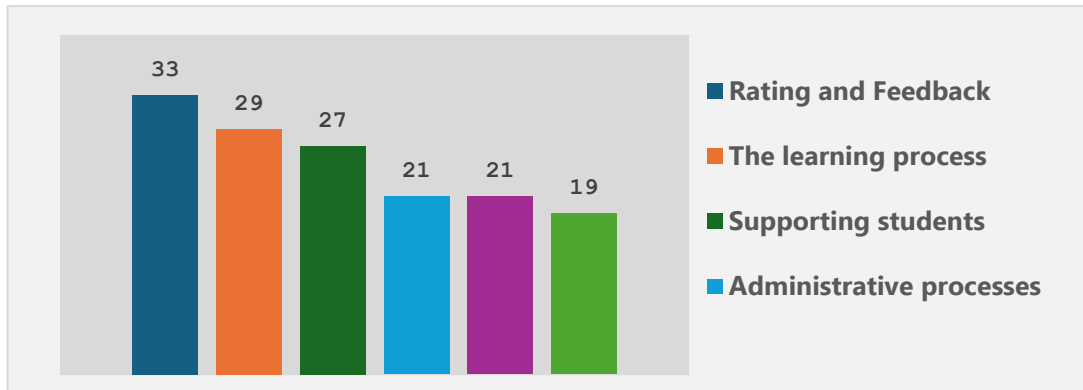


Figure 2. Tasks in which artificial intelligence benefits educational organizations

Despite the fact that proctoring systems have not been named among the most popular areas of application of artificial intelligence in the world of higher education, they are quite relevant. Proctoring systems are an innovative solution based on the use of artificial intelligence. They allow you to automate exams and tests online, making this process as convenient and cost-effective as possible.

The features of proctoring are its flexibility and reliability. Proctoring systems such as ProctorEdu (shown in Figure 3) offer a wide range of features, including automated identity verification, audio and video stream recording, data analysis, and timestamped reporting within five minutes. Simply put, artificial intelligence makes the proctoring process fully automated and reliable.

Proctoring systems take into account different behavioral metrics to ensure the validity of exam results. Features of such systems include copy protection of content, tab switching tracking, mobile phone locking, use of a mobile camera for a 360° view, as well as webcam use and screen recording.

The proctoring process involves several stages. First, students enter the interface of the learning platform, undergo an equipment check, confirm their identity and familiarize themselves with the rules of the event. Then, proctored testing begins, in which artificial intelligence controls the students' screen, webcam, and microphone. He also identifies and notes any suspicious behavior in order to draw up trust protocols after the exam. These protocols can be reviewed by proctors and serve as objective evidence in the event of disputes.

Thus, AI-based proctoring systems are becoming an integral part of online education, providing convenience for both students and educational institutions. During the pandemic, proctoring systems have become especially relevant, allowing you to conduct tests and exams remotely.

They provide a unique opportunity to conduct controlled remote exams in automatic mode, which facilitates the work of teachers and improves the quality of education.

The advantages of proctoring systems for online exams are undeniable. The first and foremost advantage is the ability to use any device to access the exam session. Students can log in at their convenience and using mobile phones or tablets. This makes the exam process more flexible and convenient.

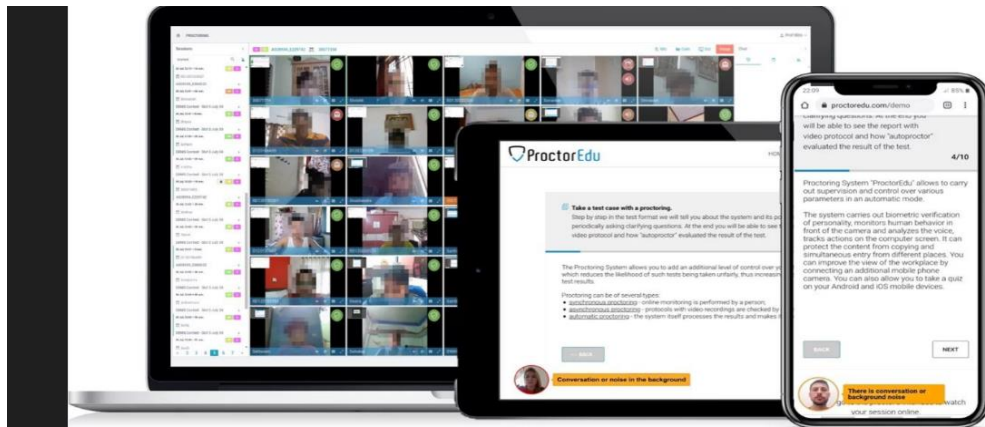


Figure 3. ProctorEdu interface

In addition, proctoring systems allow you to customize indicators with adjustable weights for each specific use case. This means that it is possible to set certain parameters that will affect a student's grade. For example, you can assign a higher weight to correct answers or to certain tasks.

Another important advantage of proctoring systems is the possibility of a full cycle of analytics with the processing of video and audio streams, recording and analysis using artificial intelligence. This allows you to generate a complete record of the exam session, including timestamps of violations and a session conclusion.

The reliability and availability of proctoring systems are also obvious advantages. According to statistics, about 99.95% of sessions pass without loss of downtime due to technical reasons. This means that students can rest assured that the system will run smoothly and without problems.

However, it is necessary to take into account some nuances. Some students complain about the time limit they can devote to looking away from the screen. However, this does not mean that a student will be automatically removed from the exam for a slight avert of the eye. Proctoring systems are based on patterns of behavior, and if a student constantly looks away and periodically peeks, it will be noticeable. To detect such violations, you do not need to look away for 20 seconds, it is enough to look away 10 times for one second.

There have also been studies on the use of biometric identification methods, such as face, voice, or electrocardiogram identification. However, these methods were rejected due to their complexity and the need for additional devices. In addition, some students associate it with polygraph and negative emotions.

Students' concerns about the use of their personal data are also not sufficiently substantiated. Compared to the information that Google collects about users, proctoring systems collect a limited amount of data.

Some stressful situations can arise for students due to the fear of an internet shutdown.

In 2022, OpenAI introduced a new development - a free chatbot ChatGPT based on the improved GPT-3.5 algorithm. This bot combines the functionality of a search engine and a digital assistant.

Now users can ask the bot to complete various tasks, such as writing code, creating a script for an advertisement, or writing an essay on philosophy that needs to be submitted tomorrow. To do this, you need to specify the topic, scope of work, and additional parameters. Within a few minutes, the bot will create a unique work that can be taught to its teacher.

The introduction of GPT caused panic and controversy in the educational community. A lot of questions arose: if algorithms can think and write for humans, how can we do training now? Is it necessary, for example, to give students essay writing tasks to teach them how to collect, summarize and analyze information, as well as formulate their own conclusions? After all, if AI can do all this, then why bother?

Many educational institutions consider it necessary to develop tools to recognize the use of neural networks in writing papers. In addition, some have suggested restricting access to ChatGPT in educational organizations due to concerns about the negative impact on learning, as well as the security and accuracy of the content generated by the system.

However, in early 2023, a student at Princeton University presented the GPTZero project, which helps educators recognize works created by a neural network. This platform analyzes the provided text according to two indicators: perplexity and "packet data". Perplexity allows us to determine how clear and logical the text of the language model is: if it is difficult to understand, then it is highly likely that it was written by a person. The algorithm also analyzes the length and structure of sentences, a person's ability to formulate thoughts, etc.

Information about GPTZero has already attracted a lot of interest from educators from all over the world, and more than 20 thousand of them have already signed up for updates on this project.

The entry into the era of artificial intelligence and applications based on it has become a new stage in the development of education. However, despite all the advantages and opportunities, educational organizations face some difficulties.

First of all, it is necessary to carry out preparatory work for the implementation of AI solutions. Building the technical infrastructure, identifying available AI capabilities, and collecting data are all stages that require attention and time on the part of the organization.

In addition, the lack of specialists in the field of artificial intelligence creates certain difficulties. Many educators are not interested in using AI solutions in their work, as they trust these tools. Perhaps this is due to the lack of digital skills and the complexity of the AI tools themselves.

On the other hand, the labor market shows a high demand for specialists in the field of artificial intelligence. It is difficult for educational institutions to compete with other industries for such personnel. However, in order to achieve the goals of the educational process, it is worth considering options for partnerships with other industries.

CONCLUSION

In general, the introduction of artificial intelligence in education opens up great opportunities and causes mixed feelings among the educational community. Balancing progress and the preservation of traditional teaching methods is a challenge for all participants in the educational process.

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IMPACT OF AYODHYA'S RAM MANDIR TOURISM ON LOCAL ECONOMIES AND INFRASTRUCTURE DEVELOPMENT: A CASE STUDY

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Abstract

This study investigates the ramifications of Ayodhya's Ram Mandir tourism on local economies and infrastructure development. With the construction of the Ram Mandir attracting a surge in visitors to Ayodhya, this research aims to comprehensively analyze its effects on the region. Key findings highlight significant economic growth spurred by tourism, including job creation, expanded business opportunities, and increased investments in hospitality and infrastructure. The study concludes with recommendations for policymakers, advocating for targeted interventions to support sustainable tourism development, preserve cultural heritage, and address the social and economic needs of the local community. Overall, this research offers valuable insights into the multifaceted impacts of Ram Mandir tourism on Ayodhya's economy, infrastructure, and society, informing future planning and decision-making processes.

Keywords: Ayodhya, Ram Mandir, Religious tourism, cultural heritage, infrastructure.

INTRODUCTION

India's vast land area and rich socio-cultural history naturally encompass numerous temples, mosques, and churches, making pilgrim travel a popular activity across all societal segments, with some events ranking among the largest religious gatherings globally. Iconic sites such as the Vaishno Devi shrine in Jammu, the Golden Temple in Amritsar, Tirumala's Balaji temple in Andhra Pradesh, and the Jama Masjid in New Delhi draw thousands of worshippers daily. The travel agent market in India has long offered extended holiday packages that tour these religious sites, reflecting the enduring appeal of pilgrimage. Recently, the government has placed a strong emphasis on promoting domestic tourism, particularly religious and adventure tourism, leveraging the concentration of religious sites and socio-religious practices. This focus has bolstered the temple economy, exemplified by practices like tonsuring at the Venkateshwara Temple in Tirumala for a child's first birthday and the 20 million pilgrims attending the annual St. Mary's Feast at the Velankanni's Basilica of Our Lady of Good Health. These initiatives and traditions significantly contribute to local economies, fostering infrastructure development, cultural preservation, and community empowerment.

OVERVIEW OF TEMPLE TOURISM

Temple tourism refers to the practice of traveling to visit religious sites, particularly temples, for various purposes, including pilgrimage, cultural interest, historical curiosity, and spiritual fulfillment. This form of tourism is significant in many countries with rich religious and cultural heritages, where temples serve not only as places of worship but also as attractions that draw visitors both domestically and internationally. The construction of new temples in China during the 1990s was driven by a combination of economic development goals, cultural revival, and strategic investment. These projects were supported by local officials and intellectuals, who leveraged the historical and cultural significance of the deities to attract tourists and generate revenue. (Lang et al. 2005). Temple tourism has significantly contributed to the economic prosperity of pilgrimage sites and their surrounding regions, creating a robust ecosystem that supports local economies through various channels.

Historical and contemporary examples, such as the Catholic pilgrimage site of Marija Bistrica in Croatia, illustrate this impact vividly. Over 40 years, Marija Bistrica attracted 7,723,000 pilgrims and tourists, generating over 77 million US dollars in revenue, an average of nearly 2 million dollars annually (Vukonić, 1998). This influx of visitors necessitated the development of extensive lodging facilities, dining establishments, and crafts markets, fostering employment and economic growth. Additionally, the demand for devotional objects and souvenirs further stimulated local trade and artisanal crafts. Historically, the competition among pilgrimage sites for relics and indulgences during the 11th and 12th centuries was driven by economic incentives as much as by religious devotion. More pilgrims meant greater revenue for both the church and the town, creating a thriving local economy reliant on the steady flow of visitors. This pattern is evident in various cultural exchanges and the resultant demographic growth in regions surrounding major shrines. Thus, temple tourism has not only been a spiritual journey for the faithful but also a significant economic engine driving prosperity in pilgrimage destinations.

TEMPLE TOURISM IN THE INDIAN CONTEXT

Religious tourism significantly contributes to local economies by generating revenue, creating jobs, and stimulating related sectors such as hospitality, retail, and transportation (Timothy and Olsen, 2006). The economic impacts of religious tourism have been documented in various contexts, including Mecca (Henderson, 2011) and Jerusalem (Shoval and Cohen-Hattab, 2001). Temple tourism has emerged as a significant driver of economic growth in many regions, with profound implications for local economies. Understanding the impact of temple tourism requires a multifaceted analysis encompassing various dimensions such as revenue generation, employment opportunities, and infrastructure development (Vijayanand, 2012).

Revenue Generation

Temple tourism serves as a major source of revenue for the local economies (Aruljothi and Ramaswamy, 2012). Pilgrims and tourists visiting temples contribute directly to the local economy through expenditures on accommodation, dining, transportation, souvenirs, and donations to religious institutions. Additionally, entrance fees and guided tours generate revenue for temple management and local authorities. The influx of visitors during peak seasons can lead to a substantial increase in revenue, stimulating economic activity and supporting businesses in the hospitality, retail, and service sectors. The Tirumala Tirupati Devasthanam (TTD) exemplifies a robust model of revenue generation through diverse streams that cater to both the spiritual and practical needs of devotees and visitors. Key revenue sources include Arjitham receipts, which are fees collected for various Sevass and special darshans, along with the sale of prasadam and popular sweets like laddu and vada (Gautam, 2020). Additional income is derived from Kalyana

mandapams and choultries, which provide wedding and lodging facilities, as well as Kalyanakatta services, where pilgrims partake in ritual tonsuring. The sale of human hair, canteen operations, grants, educational fees, toll-gate collections, and investment returns further bolster the TTD's finances. Over the last four decades, these revenue streams have seen rapid growth, driven by excellent management practices and the strategic use of IT, transforming TTD into one of the wealthiest Hindu temples globally. Remarkably, the TTD's annual budget surpasses the Indian national budget allocation for the tourism sector, highlighting its significant economic impact and efficient revenue management.

Employment Opportunities

Temple tourism creates diverse employment opportunities across different sectors, including hospitality, tourism services, transportation, retail, and handicrafts (Mondal, 2020). Hotels, restaurants, tour operators, and souvenir shops experience increased demand, leading to job creation and income generation for local residents. Moreover, temple administrations require staff for maintenance, security, guiding services, and cultural activities, further contributing to employment opportunities within the community. South Indian temples were not only centers of religious worship but also hubs of learning, art, and social activities, providing extensive employment opportunities (Nagaswamy, 1965).

These temples set high standards as employers, as evidenced by numerous inscriptions detailing their employment practices. They employed a wide range of personnel, including administrators, ritualists, artisans, craftsmen, and security personnel. Administrators, such as treasurers and accountants, managed the temple's finances and records meticulously. Ritualists, like the Sivabrahmanas in Saivite temples and Srivaishnavas in Vishnu temples, conducted sacred ceremonies, assisted by individuals responsible for preparing sacred water and food. Artisans and craftsmen contributed to the temple's architectural and artistic grandeur, while security staff ensured the temple's safety. Temples also prioritized the welfare of their workers by providing essential amenities like clothing, food, housing, education, and healthcare. This comprehensive support system not only facilitated the temple's multifaceted functions but also contributed significantly to the local economy by creating numerous stable employment opportunities.

Infrastructure Development

Tourism infrastructure encompasses transportation, accommodation, utilities, and digital services. Effective infrastructure is crucial for enhancing tourist experiences and sustaining tourism growth. Studies have shown that infrastructure development can significantly boost tourism by improving accessibility and amenities (Khadaroo and Seetanah, 2007). The growth of temple tourism often necessitates infrastructure development to accommodate the needs of visitors and enhance their experience. Investments in infrastructure such as roads, airports, railway stations, parking facilities, signage, and sanitation systems are essential for improving accessibility and connectivity to temple sites. Furthermore, the development of tourist amenities such as hotels, guesthouses, restaurants, markets, and recreational facilities supports the growth of tourism while improving the overall quality of life for residents. Local governments and authorities play a crucial role in planning and implementing infrastructure projects to support temple tourism, thereby fostering economic development and enhancing the attractiveness of the destination.

MATERIALS AND METHODS

This study employs a comprehensive secondary data analysis approach to investigate the impact of Ram Mandir tourism on Ayodhya's local economy and infrastructure development. The

secondary data were gathered from a variety of reliable sources, including government reports, academic journals, industry publications, and market research studies.

RESULTS

Study area

Ayodhya, revered as one of Hinduism's seven sacred cities, rests on the banks of the revered River Saryu in Uttar Pradesh, India, and is evolving into a global tourism destination (Sinha and Kamalapurkar, 2024). The construction of the Ram Mandir in Ayodhya stands as a historic moment deeply intertwined with the cultural, religious, and socio-political fabric of India. After decades of legal battles and societal tensions surrounding the disputed site, the culmination of the temple construction represents a significant milestone in the collective consciousness of millions of devotees. Dedicated to Lord Ram, a central figure in Hindu mythology and revered as a symbol of righteousness and devotion, the Ram Mandir holds profound spiritual significance for believers across the country and beyond. Its construction marks not only the realization of a long-standing aspiration but also a testament to the resilience of faith and the triumph of peaceful resolution in a complex and emotive issue. The sites of Ayodhya and Ramjanmabhoomi have repeatedly shifted in ownership, yet their sanctity remains steadfast in the eyes of Hindus, despite assertions from other religions. These locations evoke deep emotional connections among devotees, marked by sentiments of fondness and grief. The Ram Mandir serves as a symbol of unity and harmony, fostering a sense of pride and reverence among devotees while offering a beacon of hope for communal reconciliation and cultural revival in the region. This research has two main objectives: (1) analyse the impact of Ram Mandir tourism on local economies, including revenue generation, employment opportunities, and infrastructure development; (2) investigate the role of infrastructure investments in facilitating and enhancing Ram Mandir tourism, focusing on projects such as airport expansions, railway upgrades, and township developments.

Table 1. Timeline of key events related to Ayodhya Ram Mandir

Time Period	Event	Details
Treta Yuga (900,000 years ago)	Establishment of Ayodhya	Ayodhya is believed to have been established during the Treta Yuga in Hindu mythology, approximately 900,000 years ago.
Sixth and Fifth Centuries BCE	Rise of Buddhism and displacement of Ayodhya as capital	With the rise of Buddhism in the sixth and fifth centuries BCE, Ayodhya lost its status as the capital city, possibly replaced by Saketa.
Mid-5th Century CE	Rediscovery by Vikramaditya	Ayodhya is "rediscovered" by Vikramaditya, identified by many scholars as Skandagupta, around the mid-5th century CE.
Mid-5th Century CE	Brahmanical resurgence	Buddhism began to decline as a result of a Brahmanical resurgence during this period, coinciding with the rediscovery of Ayodhya.
1528	Construction of Babri Masjid	Babar orders the construction of a mosque on the site of the ancient Ram temple after defeating Ibrahim Lodi.
1853	Robert Montgomery Martin's survey	Survey confirms the presence of a temple at the disputed site.
1885	Mahant Raghubar Das's denied request	Request to construct a temple is denied by the district court, fearing escalation of communal conflicts.
1934	Communal conflict erupts	Conflict erupts after alleged cow slaughter by Muslims. Mosque dome is damaged, repairs undertaken by British with fines imposed.
1949	Idol of Lord Ram reportedly manifests	Idol reportedly manifests in the mosque, sparking a dispute. Court orders closure of mosque gates, later confirming idol placement.
1950	Legal battles begin	Hindu individuals and groups file suits for access to the site, countered by Sunni Waqf Board's claim of ownership.
1980	Vishwa Hindu Parishad initiates Ram Janmabhoomi Movement	Movement aims to reclaim the site for temple construction, gaining momentum under LK Advani's leadership.
1990	LK Advani's Rath Yatra	Rath Yatra gains widespread attention, accompanied by riots.
1992	Demolition of Babri Masjid	Masjid demolished amid tensions and assurances from Kalyan Singh. Riots erupt nationwide.
2003	Allahabad High Court orders ASI survey	Survey finds non-Islamic structure beneath the mosque. High Court's split verdict divides land among Hindu and Muslim parties.
2019	High Court ruling challenged in Supreme Court	The Supreme Court verdict awards land to Shri Ram Virajman and allocates five acres to Sunni Waqf Board.
2024	Inauguration of the temple	Prime Minister Modi inaugurated the temple on January 22, 2024.

Source: Based on Udayakumar (1997) and Sen (2024)

Ayodhya as a Global Pilgrimage Destination

Ayodhya, one of the most revered and ancient cities in India, holds profound significance in Hindu mythology as the birthplace of Lord Ram. With the construction of the majestic Ram Mandir, Ayodhya is undergoing a remarkable transformation to cater to the influx of pilgrims and tourists. This comprehensive development includes enhancements in accessibility, accommodation, amenities, and activities, ensuring a holistic and enriching experience for all visitors. The city's blend of spiritual heritage and modern infrastructure makes it a beacon of devotion and a prime destination for cultural and religious tourism. Below is an overview of the 5A's of Ram Mandir Temple Tourism that contribute to Ayodhya's growing appeal and the seamless experience it offers to its visitors:

Attraction

The Ram Mandir, situated at the sacred site of Shri Ram Janmbhoomi, stands as a testament to faith, devotion, and architectural marvel. Constructed in the traditional Nagar style, the Mandir boasts impressive dimensions, with a length of 380 feet, a width of 250 feet, and a height of 161 feet, making it a monumental symbol of reverence for Lord Ram. Its three-storied structure, adorned with 392 pillars and 44 doors, exudes grandeur and elegance. At its heart lies the sanctum sanctorum, housing the divine idol of Shri Ram Lalla, capturing the essence of the deity's childhood form. As visitors ascend the 32 stairs through the Singh Dwar, they are greeted by the enchanting aura of the Mandir, enriched by the presence of statues depicting various deities and scenes from Hindu mythology. The Mandir's architectural finesse is complemented by its thoughtful amenities, including ramps, lifts, and facilities for the differently-abled and elderly, ensuring accessibility for all devotees. Surrounding the Mandir is a Parkota, enclosing the sacred space and enhancing its spiritual ambiance. Additionally, the complex features Mandirs dedicated to other revered figures from Hindu mythology, providing a holistic experience for pilgrims. With its blend of tradition, spirituality, and modern amenities, the Ram Mandir stands as a beacon of devotion, attracting pilgrims and tourists from far and wide to experience its divine aura and architectural splendour.

Accessibility

The inauguration of Maharishi Valmiki International Airport marks a significant enhancement in connectivity to Ayodhya, especially for visitors drawn to the historic Ram Mandir. The airport, currently in its first operational phase costing \$175 million, has a capacity of 1 million passengers. This is set to expand significantly with the completion of additional domestic and international terminals by 2025, which will increase the capacity to 6 million passengers. Complementing this development, the expansion of the Ayodhya Dham Railway Station to accommodate 60,000 passengers daily will further ease access for pilgrims and tourists along with 200 Aastha Special Trains by Indian Railways for pilgrimage travel to Ayodhya. Improved road connectivity is also a key part of this infrastructure upgrade, facilitating tourism and regional development. Collectively, these initiatives aim to bolster Ayodhya's accessibility, making it more convenient for travellers from diverse locations to visit the historic city.

Accommodation

Ayodhya is witnessing a substantial expansion in accommodation options, driven by major hotel chains such as IHCL, Marriott, Sarovar, and Wyndham establishing their presence in the city. This growth is complemented by around 50 significant hotel projects initiated by the private sector, alongside numerous smaller hotels, resorts, and homestays. These developments cater to the diverse needs of visitors, from luxury travellers seeking premium experiences to budget-conscious

pilgrims. This broad spectrum of accommodation options ensures that Ayodhya can adequately support the influx of tourists and pilgrims, enhancing their stay with comfort and convenience.

Amenities

The Ram Temple premises in Ayodhya are equipped with a range of modern facilities and amenities designed to ensure a comfortable and convenient experience for all visitors. Key features include a multipurpose distribution and operations room, providing centralized management and support services. Financial services are readily available with banks and ATMs on site. Essential public utilities, including toilets, bathrooms, and washrooms, are strategically placed for ease of access. Emergency medical facilities are in place to address health needs promptly. The temple grounds are designed to be inclusive, with ramps and lifts for senior citizens and individuals with disabilities. Sustainability is a priority, demonstrated by the installation of solar energy panels and power backups. A dedicated pilgrim facility center and an efficient pilgrim/visitor management system further enhance the organization and comfort of the visiting experience, making the Ram Temple premises well-equipped to handle large volumes of devotees efficiently.

Activities

In addition to religious ceremonies and temple visits, Ayodhya offers a plethora of cultural and recreational activities for tourists to engage in. Visitors can participate in spiritual rituals, attend vibrant Aarti ceremonies, explore local markets, and enjoy serene boat rides along the Sarayu River. These activities enrich the tourism experience, providing visitors with opportunities for cultural immersion and memorable encounters.

Table 2. Activities to Enjoy at Ayodhya's Spiritual and Cultural Sites

Site	Activities to Enjoy
Hanuman Garhi	<ul style="list-style-type: none"> • Climb the stairs to reach the temple • Admire fortress-like structure and panoramic views of Ayodhya
Kanak Bhawan	<ul style="list-style-type: none"> • View beautiful idols of Lord Ram and Goddess Sita • Explore the sacred palace believed to be the palace gifted by King Kush to his wife, Queen Mandodari.
Sita ki Rasoi	<ul style="list-style-type: none"> • Explore the ruins of the ancient kitchen • Learn about ancient cooking techniques and architectural marvels
Nageshwarnath Temple	<ul style="list-style-type: none"> • Witness intricate carvings • Participate in religious ceremonies • Experience the spiritual aura of the temple
Treta Ke Thakur	<ul style="list-style-type: none"> • Explore the temple complex • Learn about its historical significance • Participate in religious rituals
Sarayu River Ghats	<ul style="list-style-type: none"> • Enjoy serene settings for reflection and relaxation • Take boat rides along the river • Witness Aarti ceremonies
Ayodhya Museum	<ul style="list-style-type: none"> • View artifacts, sculptures, and relics related to the city's ancient past • Learn about Ayodhya's rich history and cultural heritage

Source: Author

Impact of Infrastructure Investments

Enhanced Accessibility

Improved transportation networks make Ayodhya more accessible to both domestic and international tourists, encouraging higher visitation rates. The international airport is expected to attract more global visitors, further boosting the local economy (Ministry of Tourism, 2023).

Improved Visitor Experience

Better accommodation and public utilities contribute to a more comfortable and satisfying visitor experience, encouraging longer stays and repeat visits. Surveys indicate a significant increase in tourist satisfaction due to improved lodging and sanitation facilities (Tourism Development Council, 2022).

Economic Benefits

Increased tourism generates revenue for the local economy, creating jobs and supporting local businesses. The hospitality and retail sectors, in particular, are expected to see substantial growth (Economic Times, 2023).

Cultural Preservation

Infrastructure investments also facilitate the preservation and promotion of Ayodhya's cultural heritage, ensuring that future generations can appreciate its historical significance. Efforts to maintain and restore historical sites are being integrated with infrastructure projects to ensure that modernization does not come at the expense of cultural heritage (Archaeological Survey of India, 2023).

Role of infrastructure investments in enhancing temple tourism in Ayodhya

Infrastructure investments play a pivotal role in facilitating and enhancing temple tourism, contributing to the overall growth and sustainability of the tourism industry. Infrastructure development is a critical focus area for Uttar Pradesh's economic progress, with the state government undertaking significant initiatives to enhance connectivity, such as constructing expressways and expanding airports. Transformative projects like the Agra-Lucknow Expressway and the Purvanchal Expressway have notably improved transportation within the state. The construction of the Ram Mandir is poised to be a major driver of economic development in Ayodhya, potentially boosting Uttar Pradesh's tax revenue by Rs 20,000-25,000 crore through increased tourism and related activities. Additionally, the temple, along with other government initiatives, may contribute an extra Rs 25,000 crore in tax revenue by FY25 (Kanaujia, 2024). The Ram Mandir has also attracted funding for diverse development projects, positioning Ayodhya as a regional growth hub. The recently inaugurated Ayodhya Dham Station further enhances connectivity, and the temple's presence has triggered a real estate boom, with land prices surging significantly. Beyond infrastructure, Uttar Pradesh has demonstrated robust economic growth, with an estimated GSDP of Rs 24.39 trillion in FY 2023-24 and a CAGR of 9.01% over five years. Tourism remains a major economic driver, supported by government initiatives like heliport establishments. The state's diverse energy sector, strong agricultural output, and favourable investment climate further bolster its economic landscape. Strategic infrastructure projects and substantial investments in social sectors like education, health, and urban development highlight the government's commitment to holistic and sustainable development, aligning with global sustainability goals and ensuring long-term societal well-being.

Discussion

Economic Impact

Revenue Generation

Ram Mandir tourism has significantly boosted local revenue. The influx of tourists has increased spending in sectors such as hospitality, retail, transportation, and local crafts. According to the Ministry of Tourism (2023), Ayodhya's tourism revenue has increased by 30% since the construction of the Ram Mandir began.

Employment Opportunities

The tourism boom has created numerous jobs in Ayodhya. These range from direct employment in hotels, restaurants, and tour services to indirect employment in supporting industries. The increase in job opportunities has had a positive effect on local livelihoods (Gupta, 2021).

Local Businesses

Local businesses have flourished due to increased tourism. Shops selling religious items, handicrafts, and local cuisine have seen a rise in customers. This growth has encouraged entrepreneurial activities and the expansion of existing businesses (Sharma, 2022).

Infrastructure Development

Transportation

Significant investments have been made in transportation infrastructure. The development of the Ayodhya International Airport, expansion of railway networks, and improvement of roadways have enhanced connectivity, making it easier for tourists to visit the city (Ministry of Civil Aviation, 2023).

Accommodation

New hotels and guesthouses have been constructed to meet the growing demand for accommodation. These range from budget lodgings to luxury hotels, catering to diverse tourist preferences. Additionally, existing accommodations have been upgraded to meet international standards (Singh, 2020).

Public Utilities

Improved public utilities such as water supply, sanitation, and waste management have been prioritized. These improvements ensure that the city can handle the increased tourist population, especially during peak seasons (Municipal Corporation of Ayodhya, 2023).

Digital Infrastructure

Investments in digital infrastructure include the development of mobile applications, free Wi-Fi zones, and digital kiosks at major tourist spots. These enhancements provide tourists with real-time information and improve their overall experience (Department of Information Technology, 2023).

Challenges

Environmental Concerns

The rapid influx of tourists has raised environmental concerns. Increased waste generation and strain on local resources require effective management strategies to mitigate negative impacts (Pandey, 2019).

Cultural Preservation

Balancing modern infrastructure development with the preservation of Ayodhya's cultural and historical heritage is a challenge. Ensuring that development does not compromise the city's spiritual and cultural essence is crucial (Archaeological Survey of India, 2023).

Infrastructure Strain

Despite improvements, the existing infrastructure sometimes struggles to cope with the surge in tourists, especially during major festivals. Continuous upgrades and expansions are necessary to address this issue (Ministry of Road Transport & Highways, 2022).

Opportunities

Sustainable Tourism Practices

Implementing sustainable tourism practices can mitigate environmental impacts and ensure long-term benefits. Initiatives such as eco-friendly accommodations, waste management systems, and green transportation options can promote sustainability (Global Sustainable Tourism Council, 2020).

Community Involvement

Engaging local communities in tourism development can enhance the effectiveness of infrastructure projects and ensure that the benefits are equitably distributed. Community-based tourism initiatives can foster local participation and ownership (UNWTO, 2021).

Promotion and Marketing

Effective promotion and marketing strategies can attract a wider audience and increase tourism. Digital marketing campaigns and international partnerships can highlight Ayodhya's unique attractions and enhanced infrastructure (Tourism Promotion Board, 2022).

Conclusion

Ayodhya's Ram Mandir tourism has significantly impacted the local economy and infrastructure development. The increased tourist influx has generated substantial revenue, created jobs, and stimulated related sectors. Infrastructure investments have improved transportation, accommodation, public utilities, and digital services, enhancing the overall tourist experience. However, challenges such as environmental concerns and the strain on infrastructure need to be addressed through sustainable practices and continuous upgrades. Engaging local communities and implementing effective marketing strategies can further boost Ayodhya's status as a premier religious tourism destination. Therefore, the Ramjanmabhoomi Temple plays a vital role in revitalizing community identity and preserving cultural heritage by fostering collective pride,

transmitting traditional knowledge, and promoting intercultural dialogue. As custodians of cultural legacy, communities have a responsibility to safeguard and celebrate their temples as living embodiments of their cultural identity and heritage. Although the study takes into consideration the short term impacts of Ram Mandir tourism from the date of its inauguration, the future scope of the research would be to analyse the long term effects of Ram Mandir tourism on the economy of India in general and Ayodhya in particular. While the study considers the short-term impacts of Ram Mandir tourism starting from its inauguration date, future research should focus on analyzing the long-term effects of Ram Mandir tourism on India's economy overall, with a particular emphasis on Ayodhya. Additionally, future studies could explore the socio-cultural impacts of increased tourism, the sustainability of tourism growth, and the potential changes in local infrastructure and community development in Ayodhya.

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**RADICAL AND TRANSGRESSIVE EDUCATIONAL PRACTICES-CAN
LITERATURE SAVE THE WORLD?**

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Abstract

Modern forms of communication and exchange of information and knowledge indicate that we live in an increasingly digitized world, so there is a general impression that more traditional forms of educational practices which include different disciplines within the Humanities and Social Sciences are losing their value and importance. Although new achievements and advances in digital technologies and artificial intelligence should imply a rethinking of educational processes and educational curricula, they should not imply that Humanities are dying disciplines and that the departments for studying, for example, different world languages and literatures, philosophy or anthropology have no future or would soon become obsolete. On the contrary, in this paper we aim to draw attention to the importance of Humanities and the role of Social Sciences in the general education of future generations and in cultivating the creative, critical and analytical spirit in young people, but also in nurturing and stimulating cultural diversity, tolerance, humanity and empathy. For these purposes, from a theoretical point of view, we refer to Martha C. Nussbaum's ideas on the importance of Humanities in cultivating humanity and democracy and Maryanne Wolf's insights on literacy and reading in the digital world of 21st century, on the one hand, and the need for transgression, openness, hope and affection in the educational practices advocated by Bell Hooks, on the other hand. Additionally, through the analysis of Azar Nafisi's non-fictional works (from *Reading Lolita in Tehran* to *Read Dangerously*), we aim to question the role and power of literature in changing the world (for the better) and in the (self)discovery and understanding of what it means to be human and humane in the 21st century.

Introduction

Modern forms of communication and exchange of information and knowledge indicate that we live in an increasingly digitized world, so there is a general impression that more traditional forms of educational practices which include different disciplines within the Humanities and Social Sciences are losing their value and importance. Although new achievements and advances in digital technologies and artificial intelligence should imply a rethinking of educational processes and educational curricula, they should not imply that Humanities are dying disciplines and that the departments for studying, for example, different world languages and literatures, philosophy or anthropology have no future or would soon become obsolete. On the contrary, in this paper we aim to draw attention to the importance of Humanities and the role of Social Sciences in the general education of future generations and in cultivating the creative, critical and analytical spirit in young people, but also in nurturing and stimulating cultural diversity, tolerance, humanity and empathy. For these purposes, from a theoretical point of view, we refer to Martha C. Nussbaum's ideas on the importance of Humanities in cultivating humanity and democracy and Maryanne Wolf's insights on literacy and reading in

the digital world of 21st century, on the one hand, and the need for transgression, openness, hope and affection in the educational practices advocated by Bell Hooks, on the other hand. Additionally, through the analysis of Azar Nafisi's non-fictional works (from *Reading Lolita in Tehran* to *Read Dangerously*), we aim to question the role and power of literature in changing the world (for the better) and in the (self)discovery and understanding of what it means to be human and humane in the 21st century.

About Humanities, democracy and new educational practices

The theorist Martha C. Nussbaum in her works *Cultivating Humanity* and *Not for Profit* refers to some current educational practices and points to the increasingly dominant (world) trend of pushing humanistic disciplines out of educational curricula and the aspiration to educate the so-called pragmatic, socially "more useful" work force by giving primacy to technical, formal sciences and vocational studies. However, although modern society is in desperate need of these disciplines and although we can hardly imagine our future without appropriate digital literacy and the progress in science and technical disciplines, the devaluation of the Humanities and their exclusion (that is, the underfunding) from educational programs can cause serious setbacks in the progress of humanity, democratic processes and future social arrangements, as well as our understanding of what it means to be human and humane. In times of economic instability and a world in which profit and material wealth are the benchmark for a successful life and successful societies, the humanistic principles of (self)reflection, of a critical spirit, freedom of thought and responsible civic action for the collective good are seriously devalued.

Nussbaum explains that the value of humanities and liberal education lies in the reforming potential that Seneca advocated. The traditional understanding of "liberalis" as education for the free, i.e. for the free caste and rich elite, Seneca reinterprets and indicates that education is truly free/liberal only if it educates free citizens, citizens who are free not because of wealth or birth, but because they can call their minds their own (Nussbaum 1997: 293). Hence, the need to study different humanistic disciplines, regardless of the primary professional choice or vocation, is precisely in their potentials for cultivating the mind, freedom of thought and exchange of ideas, critical spirit, curiosity and creative capacities. Humanities, as Seneca explains, does not imply the education of uncritical moral relativists, but on the contrary, people who will question traditional understandings and have a critical and reflective attitude about what is good or bad. They will know and study human history and philosophical thought and they will cherish the benefits of previous knowledge but also learn from the mistakes of their predecessors, so they could think with care and love about the future of humanity. Nussbaum warns:

“It would be catastrophic to become a nation of technically competent people who have lost the ability to think critically, to examine themselves, and to respect the humanity and diversity of others... It is therefore very urgent right now to support curricular efforts aimed at producing citizens who can take charge of their own reasoning, who can see the different and foreign not as a threat to be resisted, but as an invitation to explore and understand, expanding their own minds and their capacity for citizenship.” (Nussbaum 1997: 300-301).

Therefore, the goal and justification of humanistic disciplines, among other things, lies in the basic need of people to understand themselves and the world in which they live, to live life with awareness and responsibility and to work in the direction of personal and collective advancement and good. Humanistic disciplines should nurture and cultivate that open spirit and advance people's capacities for deep thought and curiosity to discover and create new

things and new worlds in an affective and empathetic spirit. The opposite, as Nussbaum warns, may indeed lead to a catastrophic, idealess, technocratic future of (self)isolationism, chauvinism and bare pragma. Maryanne Wolf's remarks in her research on the meaning of literacy and reading for humans in the past, but especially today at the beginning of the 21st century and perhaps at the beginning of a new digital era for humanity, are also in this direction.

In *Reader, Come Home: The Reading Brain in a Digital World* and *Tales of Literacy for the 21st Century: The Literary Agenda*, M. Wolf investigates the phenomena of reading and literacy and the ways in which reading affects human development and humanity in general using knowledge and experiences from various fields: from education, psycholinguistics, literature, neuroscience, technology and philosophy. She indicates that: „Literacy alters the brain in profoundly transformative ways, which alters the person, which alters the species, which alters humanity itself. There is little more important for the future of our species' intellectual development.“ (Wolf 2016: 1) Literacy, Wolf explains, is not an innate human trait, but an acquired skill that has seriously changed and will continue to change the way we think and function as humanity. Hence, the questions of what it means to be literate in the 21st century, as well as the impact of digital technologies in the direction of advancing or degrading the level of literacy and the human capacity for in-depth reading, analytical reasoning and essential cognitive development, are crucial in Wolf's research.

Firstly, she makes a key distinction between reading, literacy and literary. So literacy should be understood as a capacity to read and write while reading refers to more specific cognitive, linguistic, affective and physiological processes of decoding and comprehending written texts. However, the basic thing to understand about the reading process is that it should not be reduced to the ability to decode textual information, but "reading is ultimately about an encounter between a reader and another mind that leads to thinking beyond ourselves". (ibid 3) Hence the distinction between "literal" and "literary" that Wolf points to. Being literate is not reduced to the literal decoding of information but to human discourse with another mind, beyond the explicit and finished information and "in the contextual feeling of a thought - its nuance, resonance and richness for further development; and thus in the increased capacity for realization and discovery" (ibid 3) These are key premises in Wolf's work and in our understanding of reading as a complex activity, which does not imply a simple textual exchange of information but a process through which we learn about the world and ourselves and an opportunity to "outgrow ourselves"(to think beyond ourselves), to expand our horizons and intellectual and emotional capacity.

Reading fundamentally changes a person, not only in the way our mind works but also in the way we "process" information. What Wolf refers to in her research is how traditional forms of reading books and exchanging information have influenced the development of human cognitive capacities as opposed to the changes that occur with the reading brain as it adapts to digital media and the influences of the new digital technologies. Wolf explains that reading develops the so-called contemplative dimension and capacity for deep reading, which are necessary for the understanding of complex ideas, for identification with what is read and for the development of empathy in people. The exposure of the modern "reading brain" to the abundance of information through modern digital media seriously changes the way we "read" and reason about the world. Wolf warns that as we become more dependent on digital media, our capacity for deep reading and contemplation may be at risk as well as our cognitive patience since we tend to process information quickly and in brief bursts. This severely limits our critical potentials. We read perhaps more than our ancestors and have access to much more information and knowledge, but we "receive/process" much less from what we read and do not develop a critical and contemplative attitude. That is, at the expense of the quantity of information, our

brain loses the capacity for quality "processing" of that information and the possibility of substantial cognitive development.

However, Wolf's critical remarks about new forms of digital literacy must not be understood as a call to reject digital media, but to adapt and use them in the direction of advancing human potential. What we want to highlight from Wolf's research on the "digitally trained mind" of today's generations, which do not have the opportunity to adequately develop the potential for in-depth critical reading, is her attempt to point out the positive aspects of new forms of digital literacy and how it can be used in the promotion of literacy. It is defeatist and unproductive to think about new digital media and breakthroughs in the field of artificial intelligence exclusively in a negative context, censoriously and with a great deal of skepticism. On the contrary, the digital age is our reality, so the focus should be on appropriate educational practices and the development of digital literacy that will use the benefits of new technological achievements to improve human creative potentials and focus on the development of appropriate critical and ethical mechanisms in creating and exchanging of information and (new) knowledge. Therefore, Wolf does not suggest rejecting digital media as harmful to the development of cognitive capacities among young people, but for a balance between traditional forms of in-depth/deep reading and digital literacy and information exchange, and for this we need radical educational changes and a transgressive approach to education in direction of some of Bell Hooks' comments and ideas.

On transgressive educational practices and informal educational communities

Bell Hooks is a prominent writer and scholar who has an extensive contribution to the development of feminism and feminist studies, but with her works *Teaching to Transgress: Education as the Practice of Freedom* and *Teaching Community* she additionally offers an original approach and commentary on the function of education and the organization of the educational processes in the direction of the development of free thought, the critical spirit and the reformation of oppressive social systems. Like M. Nussbaum, Hooks as well warns that in the contemporary public discourse there is a promotion of ideas that humanistic disciplines have no particular value and there is an overall trend of cultural devaluation of the teaching vocation. (Hooks 2003: xi-xiii) Hooks explains that the benefits of humanistic disciplines in education must be emphasized, as well as the role that teachers had, have and will have in positive social changes of equality and just treatment for all, stressing that:

We need mass-based political movements calling citizens of this nation to uphold democracy and the rights of everyone to be educated, and to work on behalf of ending domination in all its forms—to work for justice, changing our educational system so that schooling is not the site where students are indoctrinated to support imperialist white-supremacist capitalist patriarchy or any ideology, but rather where they learn to open their minds, to engage in rigorous study and to think critically. (Hooks 2003: xiii)

Education and educational curricula have a key formative function in social organization and hierarchy. The classroom and the educators, understood both in a narrower and a broader sense, can be conservative and act as a limiting factor for one's free intellectual development, but they can also be radical and transformative. In *Teaching to Transgress*, Hooks recalls that for her school was a place of ecstasy, of pleasure, but also of danger. If the school is a free space for the exchange of ideas, the knowledge obtained through this democratic and engaged pedagogy can have a transformative and transgressive function. She recollects:

“To be changed by ideas was pure pleasure. But to learn ideas that ran counter to values and beliefs learned at home was to place oneself at risk, to enter the danger zone. Home

was the place where I was forced to conform to someone else's image of who and what I should be, School was the place where I could forget that self and, through ideas, reinvent myself." (Hooks 1994:3)

In this quote, "home" can be interpreted literally with the meaning of our closest environment and family, but also more symbolically as space/institutions that directly influenced our development and whose value systems we have unconsciously adopted as normal, natural or correct without developing a critical attitude. That is, in the spirit of Althusser, the school, but also the family, our closest environment, dominantly promoted social ideas and concepts in the media, are ideological state apparatuses, which shape our identity and worldview, often in a subtle, unobtrusive way. Therefore, it is not at all naive what types of educational policies will be supported, what will be included or rejected from educational curricula and what is promoted to us as socially acceptable and useful through the public media. Thus, the school must not be a censored space for ideological formation and unification of future generations in accordance with the current dominant social ideas, but a free space where everyone can find their voice, share their ideas and worldview, cultural tradition and (pre)convictions and will be able to develop freely as a unique individual.

If educational practices are not free, democratic and reformatory, we face the danger that the educational system will become (stay) a space for perpetuating outdated ideas and concepts, for limiting the human spirit and creative potentials, instead of a space for intellectual growth and development. If, through the process of education, the young generations do not acquire the skill of critical thinking and examining knowledge and information, the digital age in which we live and the digital media space can be a very fertile ground for misinformation, easy manipulation and dissemination of harmful, discriminatory and chauvinistic ideas and patterns of behavior. It is therefore important to think about educational policies and practices from a position of "liberating the mind rather than indoctrinating it", developing critical thinking in students and preparing them to accept and perceive the world in all its complexity, diversity and potential for both good and bad. Hooks advocates the so-called engaged pedagogy led by progressive educators who do not ideologically indoctrinate students, but develop and nurture critical thought and creativity, transforming the classroom into a free space for the exchange of ideas, openly discussing issues of imperialism, race, gender, class, sexuality etc. Liberal educational practices should imply fair/just treatment and representation of diverse voices, that is, as Hooks explains: „Whenever we love justice and stand on the side of justice we refuse simplistic binaries. We refuse to allow either/or thinking to cloud our judgment. We embrace the logic of both/and. We acknowledge the limits of what we know“. (Hooks 1994:10)

When Hooks talks about transgressive educational practices, about engaged pedagogy and education of hope and empathy (which would stimulate openness, curiosity about the world, with love and care for others), she points to the essential difference that should be made between pluralism and diversity. Pluralism is not the same as diversity and radical and liberal educational practices should strive towards pluralism. Diversity is a fact of modern life, Hooks explains, since we are surrounded with people from different ethnic, racial, religious, national, cultural communities, but that does not mean that we are more open and ready to accept that diversity, to learn from others, to overcome the prejudices we have about ourselves and others and to develop practices of cooperation and coexistence. Pluralism is a response to the diversity of the world in which we live, but truly liberal educational practices imply a conscious acceptance of pluralism and a commitment to engage with people from other communities and cultural beliefs. Hooks writes: "Pluralism is a commitment to communicate with and relate to the larger world—with a very different neighbor, or a distant community. Many educators embrace the notion of diversity while resisting pluralism or any other thinking that suggests that they should no longer uphold dominator culture." (ibid.47), but this approach does not lead

us to change and hope for a better future and just treatment for all. So, if we return to Wolf's comments on reading and true literacy as an act of communication with another mind, as "thinking beyond ourselves", and Nussbaum's remarks on humanistic disciplines as necessary for the maintenance and development of democratic social potentials, then we can properly understand what a plural and liberal approach in educational practices and a truly engaged pedagogy that does not operate within the framework of either/or but both/and advocated by Hooks really means.

In addition, Hooks advocates "radical openness" in educational processes and a desire to explore different perspectives, as well as a willingness to change in contact with new information and ideas. Nevertheless, she warns that she, as a democratic educator, as well as many of her colleagues, have often been discouraged in their efforts to shape educational institutions into free spaces for intellectual development due to the conservatism of educational systems and the inertia or resistance to changing educational curricula. As a consequence, many talented students failed to adequately develop their intellectual potentials because they experienced educational institutions as dehumanizing spaces in which their voice, identities, or worldview were not recognized or were judged and censored, leaving little, if any, space for diversity, hope and empathy. That's why Hooks talks about the importance of creating informal educational communities and explains: "I learned to take community where I found it, bonding across race, gender, class, religious experience in order to save and protect the part of myself that wanted to stay in an academic world that wanted to choose an intellectual life. The bonds I forged were with the individuals who, like myself, valued learning as an end itself and not as a means to reach another end, class mobility, power, status." (2003: 49) Such an approach is a key step towards the transformation of educational practices, especially if we operate within conservative and restrictive social and educational systems. Unfortunately most systems are conservative and either perpetuate the same values and patterns of thought and behavior in order to maintain current power structures and hierarchies or maintain the status quo and suppress all forms of critical thought or actions that might challenge or undermine dominant power structures. That is why Hooks (as well as her colleagues who do not want to give up the struggle) fights for constant reformation of educational institutions and developing their democratic potentials as free spaces for intellectual development, where we build relationships of trust, where we cultivate the civic spirit and care for the community.

If we have a hope for a peaceful future in unity through diversity we must cultivate bonds of friendship and partnership, love and open curiosity and allow to be changed through the exchange of ideas and exposure to different perspectives, inside and outside of academia. Radical and engaged pedagogy teaches that difference and diversity enhances life, but only if we approach them in a pluralistic manner. Difference should "not to be confused with shallow notions of inclusiveness or experiencing diversity where one stands in the space of privilege, taking in and from those who are other. But rather where one is fundamentally moved—transformed utterly. The end result of this transformation is mutuality, partnership, and community" (2003:116), as Hooks explains.

Finally, we want to return again to the question of the importance of Humanities and humanistic disciplines, including the study of literature and the development of in-depth, critical reading and literacy, for the future of humanity and building relationships of trust and care for the others. To this end, we would like to refer to the memoir *Reading Lolita in Tehran* by Azar Nafisi. She is an Iranian-American author who in *Reading Lolita in Tehran* covers the transformative role of literature and the importance of creating one informal educational community in Tehran after the Iranian Revolution. As she explains, in 1995 she decides to resign from her academic post at the University of Allameh Tabatabai in Tehran, since universities become increasingly targeted by cultural purists who impose stricter sets of laws,

policies of gender segregation and punishing disobedient professors. (Nafisi 2004: 5) But in her urge to educate, she decides to organize an informal "educational community" of several of her former students (with different ideological, social and religious beliefs), who agree to meet every Thursday at Nafisi's home and discuss literature. Thus they create a safe, free space, "a space of their own", perhaps initially as an escape from the harsh reality of their everyday life, but later as a critical space for (self)reflection and intellectual development. The literary works that they analyze during those meetings (*1001 Nights, Lolita, The Great Gatsby* etc.) not only reveal to them the transformative and subversive power of literature, but also encourage them to question and produce their own realities, about which previously they felt so helplessly speechless. (ibid. 26) Nafisi stresses that one of the basic premises of these informal meetings with her students was to read and analyze the works of different authors in order to be touched by other people's thoughts and to make them think beyond themselves and their immediate reality.

In that regard, Nafisi quotes philosopher T. Adorno in order to explain the need for reading fiction, who says:

"The highest form of morality is not to feel at home in one's own home." ...most great works of the imagination were meant to make you feel like a stranger in your own home. The best fiction always forced us to question what we took for granted. It questioned traditions and expectations when they seemed too immutable. I told my students I wanted them in their readings to consider in what ways these works unsettled them, made them a little uneasy, made them look around and consider the world, like Alice in Wonderland, through different eyes." (Nafisi 2004: 61)

Adding during one of the later meetings that:

"A novel is not an allegory ... It is the sensual experience of another world. If you don't enter that world, hold your breath with the characters and become involved in their destiny, you won't be able to empathize, and empathy is at the heart of the novel. This is how you read a novel: you inhale the experience." (ibid. 72)

Bearing in mind Nussbaum's, Wolf's and Hooks' warnings and comments on the value of Humanities and Nafisi's own statements and experience of the transformative power of literature and deep reading, if we go back to the question posed in the subtitle of this text whether literature has the power to change the world, we can certainly conclude that by devaluing humanities we devalue key aspects of human complexity and limit our potential for (self)reflection, growth and transformation. If we do not develop educational practices of openness, inclusiveness, pluralism and empathy, which are mostly taught within humanistic disciplines, our humanity, understood as care and love for others and the development of peaceful coexistence, is in danger and put into question.

In that regard, instead of a conclusion or a traditional summery we want to end with a quote from Nafisi's book, told postfestum by a student about one of her democratic professors who, despite disagreements and different ideological convictions, testifies in favor of one of his students. She states:

"Dr. A's action was a manifestation of the principles he had taught in his literature classes. Such an act can only be accomplished by someone who is engrossed in literature, has learned that every individual has different dimensions to his personality... Those who judge must take all aspects of an individual's personality into account. It is only through literature that one can put oneself in someone else's shoes and understand the other's different and contradictory sides and refrain from becoming too ruthless. Outside the sphere of literature only one aspect of individuals is revealed.

But if you understand their different dimensions you cannot easily murder them. . . . If we had learned this one lesson from Dr. A our society would have been in a much better shape today." (Nafisi 2004: 76)

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**MINERALOGICAL COMPOSITION OF GRAY-BROWN (DRY-STEPPE ZONE) AND
MEADOW- SIEROZEM (SEMI-DESERT ZONE) SOILS OF AZERBAIJAN**

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ABSTRACT

This article presents the results of a study of changes in the mineralogical composition of gray-brown and meadow -sierozem soils in the semi-desert and dry-steppe zones of Azerbaijan. During the irrigation mobility of Si and Al and regularly Fe and Mn decrease due to rise of groundwaters. Virgin soils in horizon A contain 56-58% of SiO₂, and this descends towards soil-forming rocks (49-51%). Decrease of SiO₂ is observed in the next distribution on profile in the upper ploughing layer of the irrigated soils. The virgin and irrigated soils don't differ for a quantity of Fe₂O₃. The soils of the dry steppe zone are richer in iron oxides (7-8%) compared to semi-desert soils (6-7%). In the irrigated soils of the dry-steppe zone, a noticeable increase in the content of Al₂O₃ is observed. Noteworthy is the high content of silicate magnesium in both irrigated and virgin (6-7%) soils of the semi-desert zone. The low molecular ratio of SiO₂:R₂O₃ in virgin and irrigated soils of both zones (3.5-5.0) allows us to classify them as the sialite - clay type of weathering. A quantity of silica – calcium sharply decreases in the virgin soils with silt fraction, and this isn't observed in the irrigation period. Molecul ratio of SiO₂:R₂O₃is the silt fractional virgin soils 3.3–4.3 (dry-steppe) and 4.3–4.5 (semi-desert); but it is 3.4–4.0 and 3.7–4.8 in the irrigated soils. This ratio and presence of K₂O, MgO in silt fraction is explained by predominance of hydroslude minerals in silt fraction of virgin soils, but by predominance of montmorillonum group in the irrigated soils. A quantity of montmorillonite rises in the upper layer and low layer if hydroslude dominates in the upper layer of the silt fraction, increase of SiO₂:R₂O₃ ratio in the silt fraction of soil-forming rock proves it. Considering these changes, in accordance with the WRB 2014 system irrigated gray- brown soils can be classified as Someric Kastanozems (Anthric, Loamic) and irrigated meadow-serozemic soils - Irragric Gleyic Calcisols (Calcic, Loamic).

Keywords: semi-desert and dry-steppe zones, gray-brown and meadow - sierozem soils, mineralogical composition.

INTRODUCTION

Change of the mineralogical composition of soils under an influence of irrigation is a complex process, this is related to irrigation floats and change of elements under the influence of water and internal weathering (Minashina 1974, Abbot 1976, Iskenderov 1977, Aranbayev 1978, Geokhimiya 1978, Brezny 1975, Vormstein 2017, John 2021, Pallwal, 2071, Lisetskii 2017, Aliyev 2021). In particular, the record of long-term agricultural impacts in the soil profile is of great interest for archaeologists (Collins 1995, Mannering 1989). Degradation of chloride accumulates in irrigated soils, but slude minerals in agro-irrigation floats (Sandor 1991, 1995). During the irrigation mobility of Si and Al and regularly Fe and Mn decrease due to rise of groundwaters. A composition of floats plays a main role in formation of the soils. There are definite differences in chemical and mineralogical composition of the sediments of the Kur – Araz river (Ganievaa at al, 2019, Ramazanova at al., 2015, 2017, 2020, Gurbanov at al., 2021, Babaev at al., 2015, Sandor 1998, Essington 2004, Stumm 1992, Jackson 1968, Huang 2022). The aim of the study is to assess

changes in the mineralogical composition of gray-brown (dry steppe zone) and meadow -sierozem soil (semi-desert zone) soils of Azerbaijan under the influence of their long-term agricultural use.

MATERIALS AND METHODS

The object of study is the gray-brown (dry steppe zone) and meadow -sierozem soil (semi-desert zone) soils of Azerbaijan. In the classification and diagnostics of soils of the USSR in 1977, gray-brown soils are assigned to the reference group – Grey Cinnamonic soils /Luvic Calcicoils/Luvi- Calcic Kastanozems and meadow- sierozem soils - belong to the reference group - Gleysols / Gleyic Calcisoils (Krasilnikov 1999). The gray-brown soils is clay carbonate soils with a low-humus profile, chestnut-brown color of the upper horizon, in structure and properties are transitional between brown soils and gray soils (Shishov 2004, Field guide to soils in Russia, 2008), according to the classification of soils of Azerbaijan - to gray-brown (Grey Cinnamonic) and meadow-sierozem [(Gleyic Calcisoils) (Babaev 2017). The meadow- sierozem soils is low-humus accumulative-carbonate -2.00-2.10%, the presence in the profile of signs of waterlogging and associated reducing conditions; can be at a depth of 50-100 cm from the surface (Endogleyi-), at a depth of up to 50 cm from the surface (Epigleyi-).

The laying of soil sections, their description, the selection of soil samples and the establishment of the preliminary classification name of the soil in the field were carried out according to the Guidelines for Soil Description (FAO, 2012) and according to the methods (Soil description manual &FAO, 2012; WRB, 2014). In soil samples, the following were determined the mineralogical composition of the fraction $> 1 \mu\text{m}$ was determined according to Chang (1974, Russian translation); the mineralogical composition of the silty ($<1 \mu\text{m}$) fraction was determined using a DRON-3 X-ray diffractometer. Based on morphological and physicochemical properties, the name of gray-brown (dry steppe zone) and meadow-sierozem (semi-desert zone) soils was given according to the International Soil Classification based on the Abstract Base (WRB, 2014). In table 1 shows the objects of research and their location.

RESULTS AND DISCUSSION

The general analyses of the silt fractions in the virgin and irrigated soils indicate (tabl.2) that there are definite differences in a total composition of the cultivated semi-desert and arid field soils. The virgin soils and A – layer consist of 56 – 58% of SiO_2 , and this descends towards soil-forming rocks (49 – 51%). Decrease of SiO_2 (4 – 5%) is observed in the next distribution on profile in the upper ploughing layer of the irrigated soils. It is assumed that distribution of SiO_2 on profile in the virgin and irrigated soils and differences in composition are determined by soils which are washed with irrigation water on the one hand, and formed by irrigation floats on the other hand. The virgin and irrigated soils don't differ for a quantity of Fe_2O_3 . Increase of the amount of Al_2O_3 (17 – 22%) is observed in the irrigated soils of the arid field zone. High content of magnesium silicate in the virgin and irrigated soils of the semi-desert zone (6 – 7%) attracts attention. Si_2O_2 combination exposes virgin and irrigated soils to siolite – clay type weathering. (3.5 – 5.0, tabl.3).

A total chemical composition of the clay fraction is a main diagnostic index in definition of mineralogical composition of soil. In many cases, in clay fractions; a weak increase of FeO is observed in the virgin and irrigated soils of the research objects. A quantity of silica – calcium sharply decreases in the virgin soils with silt fraction, and this isn't observed in the irrigation period. Molecul ratio of $\text{SiO}_2;\text{R}_2\text{O}_3$ is the silt fractional virgin soils – 3.3 – 4.3 (arid field) and 4.3 – 4.5 (semi-desert);but it is 3.4 – 4.0 and 3.7 – 4.8 in the irrigated soils. This ratio and presence of K_2O , MgO in silt fraction is explained by predominance of hydroslude minerals in silt fraction of virgin soils, but by predominance of montmorillonum group in the irrigated soils. X – raydiffractograms of

silt fractions were obtained to determine the mineralogical composition of irrigated and virgin soils accurately. An existence of montmorillonite – hydroslude association in virgin soils of the arid field zones confirmed by presence of caolinite, chlorite, and fine dispersed quarts. A composition of these minerals changes along the profile. A quantity of montmorillonite rises in the upper layer (58-85 cm) and low layer (125-170) if hydroslude dominates in the upper layer of the silt fraction, increase of SiO₂:R₂O₃ ratio in the silt fraction of soil-forming rock proves it. Chloride mineral is distinguished with a stable distribution in the profile. Slight change, reflexes are observed at 58 – 85 cm of depth in connection with increase of montmorillonite quantity for caolinite. Besides, mixed – layered minerals – slude montmorillonite samples also participate in most cases. The mineralogical composition of the silt fractions of the irrigated soils also belongs to virgin soils. There is hydroslude and fine dispersed quartz in 0 – 22 and 22 – 43 cm of silt fraction, but they are absent in the low part of the profile. An amount of montmorillonite minerals rises in the middle parts of the profile in the virgin and irrigated soils. This process is more intensive in irrigative condition.

A quantity of SiO₂ reduces, Fe₂O₃ in the buried soils. So, the high content of calcium and magnesium, the absence of antimony and the difficulty of separation of cations during the alkaline reaction create conditions for the montmorilonization process.

Table 1. The location of research objects and their characteristics

Coordinates	Research location	The name type of the soil	Absolute height, m a.s.l	Relief, slope°	Climate	Crops and cultivated crops
40°60'67.75"N 47°17'02.71"E	Yevlakh region	Grey Cinnamonic, virgin soils	250-260	Piedmont sloping plain, 0.7-1.0°	Dry subtropic steppe. Climate is subtropical, softwinter (+1–+2°C), hot summer (+25...+26°C), CM-0,3-0,5; ID-2-3; >10°C-	Artemisia absinthium L., Andropogon ischaemum L., Festuca sulcata (Hack.) Nym., Elymus repens L., Cynodon dactylon (L.) Pers., Stipa cappilata L., Poa annua L., Myosurus minimus L., Juniperus communis L., Ceratocephala testiculata (Crantz) Besser
41°06'11,17"N 45°28'07.32"E	Aghstafa region	Irrigated Grey Cinnamonic (about 100 years old)	250-260	Sloping plain, 0.4-0.9°	3344-4472°C; 122,5-128,5 kkal/sm ² ; t _{air} >10°C-210-240 days; t _{soil} >5°C-240-270 days	Secale cereale +Vicia + panic Brassica napus → Zea mays + Glycine + Sorghum + Amaranhtus→ Hordeum + Vicia; Medicago, Triticum durum
41°18'008" N 48°16'098" E	Kyudamir region	Meadow-sierozem soil, virgin soils	3-5	Sloping plain, 0.3-0.7°	Dry subtropic semi-desert; softwinter (+2.6 - +3.6°C); hot summer (+27.9 –29.5°C); CM-0,09-0,25; ID-3-4; >10°C-3907-	Artemisia absinthium L., Andropogon ischaemum L., Festuca sulcata (Hack.) Nym., Elymus repens L., Cynodon dactylon (L.) Pers., Stipa cappilata L., Poa annua L., Myosurus minimus L., Juniperus communis L., Ceratocephala testiculata (Crantz) Besser
40°29'37.689"N 47°43'34.456"E	Ujar region	Irrigated meadow-sierozem soil	35-48	Sloping plain, 0.2-0.4°	4600°C;130-133 kkal/sm ² ; t _{air} >10°C-300-330 days; t _{soil} >5°C-250-360 days	Medicago, Triticum durum

Table 2. Total chemical composition of soil and silt fractions

Soil section, №	Depth, cm	SiO ₂	Fe ₂ O ₃	Al ₂ O ₃	TiO ₂	MnO	CaO	MgO	SO ₃	P ₂ O ₅	K ₂ O	Na ₂ O	
Arid field zone, grey – brown, %, on non-carbonate and humus-free soils													
625, Virgin	0 – 17	57,5	8,07	16,1	0,17	0,36	5,62	3,67	1,03	0,11	uncertain	uncertain	
	17 – 31	8	7,08	0	0,09	0,30	8,84	3,31	1,18	0,11			
	31 – 85	53,3	7,09	15,5	0,14	0,40	6,98	4,34	1,33	0,11			
	125 – 170	1	6,13	5	0,13	0,31	8,06	3,68	2,00	0,09			
		54,9		15,4									
		7											
		48,7		13,9									
		9		5									
	%, on mineral part of silt												
		0 – 17	59,2	12,71	19,6	0,63	0,05	1,03	4,76	0,52	0,12	1,74	2,10
		17 – 31	0	12,94	0	0,63	0,06	1,02	5,56	1,05	0,07	1,82	2,18
		31 – 85	58,3	10,35	17,5	0,57	0,07	1,41	5,70	1,21	0,07	2,14	2,57
		125 – 170	1	9,04	8	0,50	0,10	1,37	4,97	1,16	0,06	1,72	2,08
			57,3		16,3								
		3		5									
		60,5		17,9									
		9		5									
602, Irrigated	0-22	52,6	8,47	17,0	0,55	0,13	5,42	4,73	0,80	0,23	2,15	1,23	
	22-43	6	6,47	3	0,58	0,16	5,21	4,87	0,89	0,23	2,51	1,11	
	118-147	53,5	7,76	22,0	0,68	0,09	4,02	4,00	1,01	0,18	2,63	0,91	
	147-170	9	8,04	7	0,76	0,14	3,90	4,76	1,38	0,18	2,22	0,77	
		55,2		21,9									
		7		1									
		54,6		20,7									
		1		6									
	%, on mineral part of silt												
		0-22	56,1	9,71	20,7	0,24	0,05	5,26	5,18	0,52	0,05	2,15	1,23
		22-43	9	9,44	4	0,14	no	2,66	6,50	0,84	0,02	2,40	1,06
		118-147	57,7	11,12	18,8	0,18	no	6,07	4,35	0,76	traces	2,42	0,83
		147-170	8	9,87	8	0,13	0,07	2,47	4,50	0,72	traces	1,97	0,68
			50,1		20,5								
		3		9									
		49,6		23,3									
		6		5									
Semi-desert zone meadow- sierozem soil, %, on non-carbonate and humus-free soils													
661, Virgin	4-12	56,1	6,74	18,6	0,19	0,04	6,68	6,71	0,30	0,10	2,28	1,75	
	12-30	6	6,72	9	0,22	0,02	6,35	5,82	0,28	0,14	1,85	1,58	
	57-74	54,4	6,66	16,1	0,17	0,01	7,33	6,32	0,39	0,16	1,77	1,77	
	131-165	9	5,83	8	0,29	trace	7,91	6,43	0,35	0,07	1,83	1,77	
		50,5		15,0									
		0		7									
		51,0		14,6									
		7		1									
	%, on mineral part of silt												
		4-12	59,2	7,94	18,6	0,23	0,05	3,45	6,01	0,96	0,13	2,17	1,00
		12-30	0	7,72	3	0,30	0,03	3,52	5,64	1,55	0,20	2,68	1,35
		57-74	56,6	7,50	17,7	0,23	0,03	5,34	5,89	1,74	0,22	2,21	1,42
		131-165	9	7,41	5	0,34	0,01	5,82	6,33	1,51	0,09	1,46	0,42
			55,5		16,5								
		7		8									
		57,3		16,5									
		1		8									
%, on non-carbonate and humus-free soils													

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662, Irrigated	0 – 27	50,7	6,65	14,2	0,17	0,04	7,96	5,72	0,21	0,12	1,83	1,56	
	27 – 40	3	6,18	2	0,21	0,01	7,31	4,81	0,17	0,11	1,89	1,77	
	65 – 88	50,8	5,83	16,1	0,22	0,01	8,63	5,00	0,39	0,14	1,83	1,56	
	115 – 147	2	6,24	1	0,17	0,01	10,19	5,12	0,32	0,07	1,77	1,54	
		48,7		15,0									
		6		3									
		79,6		13,6									
		7		9									
	%, on mineral part of silt												
		0 – 27	57,7	8,53	15,6	0,19	0,06	5,33	6,68	1,51	0,16	2,36	1,07
		27 – 40	4	7,94	7	0,20	0,03	5,10	5,39	1,82	0,16	2,43	1,07
		65 – 88	57,6	7,64	18,2	0,29	0,03	2,87	5,54	1,39	0,18	2,53	1,34
		115 – 147	9	7,12	0	0,23	0,03	3,77	6,17	1,83	0,10	2,44	1,18
			59,9		17,1								
		3		6									
		60,9		15,9									
		1		1									

Table 3. Molecular relation in soils and silt fractions

№ soil section	Depth, cm	SiO ₂ :Al ₂ O ₃	SiO ₂ :Fe ₂ O ₃	SiO ₂ :R ₂ O ₃	
Arid field zone, grey – brown, %, on non-carbonate and humus-free soils					
625, virgin	0 – 17	6,0	19,20	4,57	
	17 – 31	5,87	22,00	4,63	
	31 – 58	4,48	21,25	3,69	
	58 – 85	6,33	23,75	5,00	
	85 – 101	6,07	21,25	4,72	
	101 – 125	5,87	22,00	4,63	
	125 – 170	5,78	20,25	4,50	
%, on mineral part of silt					
	0 – 17	4,90	12,30	3,25	
	17 – 31	5,71	12,20	3,90	
	58 – 85	5,94	15,90	4,32	
	125 – 170	5,62	16,90	4,21	
%, on non-carbonate and humus-free soils					
602, irrigated	0-22	5,18	17,60	4,00	
	22-43	4,04	22,25	3,42	
	118-147	4,38	18,40	3,54	
	147-170	4,55	18,28	3,64	
	%, on mineral part of silt				
		0-22	4,65	15,50	3,53
		22-43	5,34	16,00	4,00
	118-147	4,15	11,86	3,08	
	147-170	3,61	13,90	2,87	
Semi-desert zone, meadow – grey, %, on non-carbonate and humus-free soils					
661, virgin	4-12	5,16	22,2	4,15	
	12-30	5,74	21,5	4,53	
	57-74	5,68	20,0	4,43	
	131-165	5,95	23,6	3,04	
	%, on mineral part of silt				
		4-12	5,45	19,60	4,26
		12-30	5,53	18,80	4,27
	57-74	5,75	18,40	4,38	
	131-165	5,94	10,00	4,52	

% , on non-carbonate and humus-free soils				
662, irrigated	0 – 27	6,08	20,6	4,69
	27 – 40	5,35	21,6	4,31
	65 – 88	5,53	22,5	4,43
	115 – 147	6,17	21,2	4,78
	% , on mineral part of silt			
	0 – 27	6,40	19,20	4,80
	27 – 40	4,78	17,20	3,74
	65 – 88	5,82	19,80	4,50
115 – 147	5,07	20,25	4,05	

The basis of minerals in the silt fractions of the virgin soils of the semidesert zone is hydroslude, it is stable along the profile, but it decreases in soilforming rocks. The other one of the minerals is montmorillonite, its quantity strongly rises through decrease of hydroslude in iluvial carbonate layer. The chlorinated mineral remains stable along the whole profile in the soils of the arid field zone, and this proves that MgO constantly remains in the composition of silt fraction. The slude – montmorillonite mixed layers have been investigated in the accumulative humus layer. The irrigated soils of this zone differ from virgin soils for mineralogical composition. Here, a quantity of hydroslude minerals remains stable along the whole profile. K₂O is stably distributed in the silt fraction of the irrigated soils according to the X – ray diffractometer analysis. The second main component of the meadow – grey soils is an expanded lattice montmorillonite mineral. The information of the X – ray diffractometer allows to advance an idea about higher MgO in the composition of silt fraction and its stability in genetic layers, and distribution of chloride in the profile of irrigated soils. An amount of caolinite is more in silt fraction. Except the highly dispersed minerals, quartz and field spars are significantly noted.

CONCLUSION

It has been established that during irrigation with rising groundwater, the mobility of Si and Al decreases and the mobility of Fe and Mn naturally increases. The virgin soils and A – layer consist of 56 – 58% of SiO₂, and this descends towards soil-forming rocks (49 – 51%). Decrease of SiO₂ (4 – 5%) is observed in the next distribution on profile in the upper ploughing layer of the irrigated soils. The soils of the dry steppe zone are richer in Fe₂O₃ (7-8%) compared to semi-desert soils (6-7%). Increase of the amount of Al₂O₃ (17 – 22%) is observed in the irrigated soils of the arid field zone. Noteworthy is the high content of silicate magnesium in both irrigated and virgin (6-7%) soils of the semi-desert zone. The low molecular ratio of SiO₂:R₂O₃ in virgin and irrigated soils of both zones (3.5-5.0) allows us to classify them as the sialite-clay type of weathering. A quantity of silica – calcium sharply decreases in the virgin soils with silt fraction, and this isn't observed in the irrigation period. Molecul ratio of SiO₂:R₂O₃ is the silt fractional virgin soils 3.3 – 4.3 (dry-steppe) and 4.3 – 4.5 (semi-desert); but it is 3.4 – 4.0 and 3.7 – 4.8 in the irrigated soils. This ratio and presence of K₂O, MgO in silt fraction is explained by predominance of hydroslude minerals in silt fraction of virgin soils, but by predominance of montmorillonum group in the irrigated soils.

Considering these changes, in accordance with the WRB 2014 system irrigated gray- brown soils can be classified as Someric Kastanozems (Anthric, Loamic) and meadow-serozemic soils - Irragric Gleyic Calcisols (Calcic, Loamic).

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**REFLECTION OF THE ART OF İRSAL-I MESEL IN THE SEMANTIC LAYER IN
GAGAUZ LITERATURE**

**GAGAUZ YAZININDA İRSAL-İ MESEL SANATININ SEMANTİK KATMANDA
YANSIMASI**

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ABSTRACT

In the study, reference is made to the "irsal-i mesel" layer, which reflects the aesthetic trajectory of the science of 'bedi' and strengthens the semantic horizon. Rather than emotional transmission; This authentic composition, which is the real reflection of intellectual designs, has also been seen as related to rhetorical components in the style of "darb-ı mesel" or "irad-ı mesel". In order to reinforce the intellectual perception on the axis of verse or prose and to make the expression effective, the process of using a concise saying, saying or a common opinion, which is equivalent to a proverb among the discourse, has patterned the perspective of the parable. This art, which is the original connotation of anonymous products that pass through metaphorical latitude, appears to be easily deployed in memory. It has been noted that the literary value of the parable is related to the degree and strength of the similarity between the two ideas, and that it presents a variable structure in this layer.

It has been observed that the hidden literary talent of the artist, who turned to the issue in order to make the idea he put forward effective with the power of persuasion, also came to light. The artist activated the meaning reaction by processing the message he conveyed through proverbs or famous sayings in the context of the text. In addition, by making reference to the issue he will use through some verbal patterns, he both adds a harmonic pleasure to the flow of words and moves the reader's attention range to an aesthetic direction. The expression used in a concise, familiar and anonymous sequence reflects the distinctive theme in this art.

In the research universe, grammatical facts designed in the context of the text were semanticized with the interpretive analysis technique. The artistic imagination reflected from the Gagauz literary generation was examined in the hereditary dimension, and the document analysis factor was put to work. The data potential of theoretical findings regarding the research fabric was designed with a semantic projection. Therefore, it has been determined that the aesthetic patterns used in the rhetorical reaction impose an artistic movement on the Gagauz literary plane.

Keywords: Gagauz literature, İrsal-i mesel, Semantics, Aesthetics, Rhetoric.

ÖZET

Çalışmada bedi' ilminin estetik yörüngesinden akseden ve anlamsal ufku güçlendiren "irsal-i mesel" katmanına gönderme yapılmıştır. Duygusal iletimden ziyade; düşünsel tasarımların reel yansıması olan bu otantik bileşim, "darb-ı mesel" ya da "irad-ı mesel" tarzındaki retorik

bileşenlerle de ilgili görülmüştür. Nazım veya nesir ekseninde düşünsel algıyı pekiştirmek ve ifadeyi etkili kılmak adına, söylem arasında atasözü ile eşdeğer konumdaki özlü sözü, deyişi veya yaygın bir kanıyı kullanma işlemi irsal-i meselin görünüm açısını desenlemiştir. Mecazi enlemden geçen anonim ürünlerin özgün çağrışımı olan bu sanatın, hafızada kolayca konuşulduğu belirmiştir. İrsal-i meselin edebi değerinin ise anılan iki fikir arasındaki benzerliğin derecesi ve gücüyle bağlantılı olduğu, bu katmanda değişken bir yapı arz ettiği dikkati çekmiştir.

İleri sürdüğü düşünceyi ikna gücüyle etkili kılmak amacıyla irsal-i mesele yönelen sanatçının, gizil edebi hünerinin de gün yüzüne çıktığı görülmüştür. Sanatçı, atasözü veya ünlü sözler üzerinden aktardığı gönderiyi metin bağlamında işleyerek anlam tepkimesini aktive etmiştir. Ayrıca birtakım söz kalıpları vasıtasıyla, kullanacağı mesele gönderme yaparak hem sözün akış şemasına armonik bir haz yüklemiş hem de okurun dikkat yelpazesini estetiksel bir doğrultuya taşımıştır. Kullanılan deyişin özlü, bilindik ve anonim bir dizilimle resmedilmesi bu sanattaki ayırimsal izleği yansıtmıştır.

Araştırma evreninde, metin bağlamında tasarlanan gramatikal olgular yorumsal analiz tekniğiyle semantize edilmiştir. Gagauz edebi kuşağından yansıyan sanatsal imgelem, irsal-i mesel boyutunda tetkik edilmiş, doküman analizi faktörü işe koşulmuştur. Araştırma dokusuna dair teorik bulguların veri potansiyeli semantik bir iz düşünle dizayn edilmiştir. Dolayısıyla, belagat tepkimesinde işlem gören estetiksel örgelerin, Gagauz edebi düzlemine sanatsal bir devinim yüklediği tespit edilmiştir.

Anahtar kelimeler: Gagauz yazını, İrsal-i mesel, Semantik, Estetik, Retorik.

GİRİŞ

Benzetmeye dayalı sanatlardan olan, anlamsal boyuta hissel derinlik ve incelik katan “irsal-i mesel” sanatı, ileri sürülen düşüncenin güçlü bir gerçek ya da atasözü ile pekiştirilmesi esasına dayanır. Belig yörüngede “irad-ı mesel” veya “darb-ı mesel” olarak da simgelenen bu retorik gönderge; düşünsel ve sezgisel oluşumları kanıtlama, inandırıcı kılma, söylem çarkını estetiksel yönde çevirme tarzındaki belig uyarıcıları aktive eder. Söz arasında mesel veya atasözleriyle eşdeğer boyuttaki sözlerin irsal-i mesel düzleminde lirik bir görünüm arz ettiği görülür. Ayrıca söylem odağından geçen “var ye laf, nicä var bir laf, sölärdi insannar, var ye bir gagauz lafi, nasıl deniler” şeklindeki kalıp sözler aracılığıyla işlenecek olan mesele gizil bir gönderme yapılıdır. Mesel ve asıl düşünce faktörleriyle harmanlanan bu sanatsal ileti, temsil ve çağrışım yoluyla senkronize edilir. İrsal-i meselin hüner grafiği ise anılan iki düşünce arasındaki benzerlik oranıyla tasvir edilir. Dolayısıyla benzerlik derecesindeki yükseltgen eğilimin, edebî dokuyu güçlendirdiği ve genel kabul görmesi halinde, atasözü olarak yayılım gösterebildiği belirir.

İrsal-i mesel; anlatımı güçlendirmek, düşünceyi pekiştirmek amacıyla söze ve şiire atasözü, özdeyiş katma (Köklügiller, 2009: 152) sanatıdır. Daha doğrusu bir fikri, konuyla ilgili atasözü veya vecize ile pekiştirme, aydınlatma işlemidir. Bu sanatta düşüncelere destek olmak, fikri daha güzel ve inandırıcı kılmak gayesiyle konuyla ilgili seçilmiş sözlerden, o fikri kuvvetlendirecek örnekler, aktarmalar yapılarak düşünsel bir olgunluk sağlanır (Elgün, 2000: 157). İfadede böyle bir yola başvurmak, çoğunlukla şahsî bir hükme daha fazla inandırıcılık katılmasını sağlar. Şairler kendi duygu ve düşüncelerine uygun bir iddiaya yer verdikten sonra, bunun daha etkili ve ikna edici olması için genel olarak bilinen bir hükmü örnek gösterirler (Selçuk vd., 2022: 71). Atasözü olmamakla birlikte, atasözü değerinde olan ya da atasözü gibi ifade edilmiş hikmetli düşünceler de bu sanatın sınırları içine girer (Saraç, 2019:

87). Bu önermeler, ortaya atılan fikri destekleme ve muhatabı ikna etme amacı taşır (Tanç, 2006: 28).

BULGULAR

Gagauz yazınında irsal-i mesel sanatına dair estetiksel düzlemin semantik yörüngedeki görünümü şu şekilde motive edilmiştir:

1.

Nicä düşer gagauz halk masalları adetlerinä görä, neredä küülerä Kaz küüyü, Sopa küüyü, Kamçı küüyü gibi fasıl adlar veriler, biz da annatmamızda olan işleri, deyelim, Ahne adını taşıyan küüyündä geçirdik.

Neçin bu küüyün adı bölä mi? Neçin zerä o günädän, angısı için annadacez, hep mayıl olardık onun gözelliinä, insannarının insannına hem adamnına, yavaşlınan sıcaklına hem bu mayıllıktan durmamayca bayılırdık. Onuştan, herkerä burayı geldiindä yada kimä sa onun için annadarkana, hep deyärdik: “Ah Ne küü-ü!” Ama bir kerä bu iş bozuldu, çünkü var ye laf “**Bir uyuzlu koyun bütün sürüyü bozêr**” - ölä bir günü burada da oldu. Taa doorusu diil bu ayozlu küüyün içindä, ama onun bir kırında, bir baaların kenarında, nereyi biz, dostumnan, geldiydik pak hem şıralı tatlı-iişimsi biyaz üzüm satın almaa deyni. Bezbelli Yaradıcı istämedi Ahne küüyün üzünä lekä kondurmaa da yaptı ölä, ani onun kulları tarafından bizä yapılan ayıp hem esapsız işi baalarların başında yaradılsın...

(Zanet, 2023: 296)

“Bir uyuzlu koyun bütün sürüyü bozêr.” atasözünün, metne uygun bir şekilde tasarlandığı ve irsal-i mesel sanatını îma ettiği tespit edilmiştir. Sanatçı, bu vesileyle bir kişinin olumsuz davranışının tüm grubun itibarını zedeleyebileceğini, daha doğrusu bireysel bir sorunun, topluluğun genelini etkileyebileceğini vurgulamıştır. Görüldüğü üzere, anlatılmak istenen düşünsel perspektif, irsal-i mesel reaksiyonunda işlenerek güçlü bir betimle resmedilmiştir.

2.

KİRANA. Otur. (*oturdêr onu*) Petuş bizdä.

PETRANA. Neredä. (*fırlêêr*) Bän ona gösterecäm!

KİRANA. (*genä oturdêr onu*) Maazada. Meluş da orada. Girdilär Kıruşlan birêr filcan içmää.

PETRANA. (*çekeder gülmää*) O içmää gelmiş bän sa onu kıskanêrim. (*urêr annısına*) Ahmak karı! Kimä o, bendän kaarä, läázım mari?

KİRANA. Seversin Petuşu.

PETRANA. Severim zer. Severim şu sündüü. Sän bakma, ani o ölä karaca. Nicä var bir laf – **kara, ama para.** İçindän o altın. Çok okuyêr, çok biler. Ama bitki vakıtlar biraz (*urêr boozuna*) kaçırmaa başladı. Salniklär tutmêr.

(Zanet, 2023: 433-434)

Sanatçı, söylemi güçlendirmek ve düşünsel platformu etkili kılmak adına, herkesçe bilindiği anlaşılan “kara, ama para.” deyişine gönderme yaparak muhatabın aslında iyi bir kişiliğe sahip olduğunu, yani görüldüğü gibi olmadığını vurgulamaktadır. Dolayısıyla irsal-i mesel örüntüsünden ilham alınarak tasarlanan anlamsal katman, sanatsal bir iz düşünle yeniden dizayn edilmektedir.

3.

İnsan ömür boyu çalışarak savaşêr hep taa yukarı tırmanmaa: deyelim, ilkin birkaç yıl işleer kırdı aar iştä, sora, üürenip, olêr brigadir, taa sora – deputat, küü başı. Ama kimi kerä adam “kösteklener”: ya bir hırsızlık yapêr, ya içkicilää urdurêr kendisini. Da o adamı geçirenlâr başka işä, ama diil yukarı – aşaa. Ozaman, bu insan için lafederäk, yapıştırêrlar bu söyleyişi: **“Attan inip, eşää pindi!”**

(Çebotar, 2021: 73)

Metinde, genellikle kişinin üstün ya da avantajlı bir durumdan daha kötü bir duruma düşmesini veya statü açısından gerilemesini sembolize eden düşünsel önermeye gönderme yapılmış ve bu imgenin pekişmesi amacıyla irsal-i mesel olgusundan ilham alınmıştır. Söylem çarkını açıklayıcı ve örnekleyici unsurlarla çeviren sanatçı, “Attan inip, eşää pindi!” deyişimiyle düşünsel mekaniği estetiksel bağlamda semantize etmiştir. Sanatçı, halk arasında yaygın bir kullanımı olan bu estetik örneği inşa ederken, anlam akışıyla eşdeğer yöndeki darb-ı mesel dizgesini işe koşturmuştur.

4.

Varmış bir vakit, yokmuş bir vakit. Yaşarmış bu dünnedä bir karımca. Akıllıymış, işçiymiş, tertipliymiş, ama sevârmış gezmää hem baas konmaa.

Bir kerä gidârmış karımca yolca. Ansızdan taş ardından çikêr bir yılan. Görêr karımcayı da deer:

-Ey, kafadar! Nereyi gidersin? Bân dä – seninnän! Çokluk taa islää!

Karımca bakêr yılana da düşüner: **“Neredä çokluk – orada bokluk.** Şindi nasıl ondan kurtulayım?” , ama deer:

-Eer istârsän, ozaman olalım yoldaş.

(Çebotar, 2021: 127)

Sanatçı, aralarında uyum problemi olan ya da işbirlikçi yaklaşım benimseyen kişilerin nicel açıdan fazlalığı hâlinde, birtakım görüş ayrılıklarının çıkacağını ve bu durumun anlaşmazlıklara yol açacağını öne sürmektedir. Bu iddiasını desteklemek ve inandırıcı kılmak gayesiyle irsal-i mesel sanatından esinlenerek başka bir önermeyi misal göstermektedir. Metinde realize edilen atasözü, “Neredä çokluk – orada bokluk.” motifiyle şekillenmiştir. Bu dizge aracılığıyla düşünsel yapıyı güçlendiren sanatçı, anlamsal boyuta estetiksel bir yön çizerek okuyucunun dikkat algısını canlı kılmaktadır.

5.

Yarkaların Vançinin Pidoşu dostlarınnan gelêrdi. Dobrucadan. Çıkmışlar onnar Babadagdan taa gündüzkän, okadar ki avşam razgetirer onnarı Babadag daayı içindä. Olsa o daa gibi. Cabadan mı söylelâr, ani **“korku daaları bekleer”**. Sölêrdi insannar, ani bu erlerdä **“azlık gezmää – torlak gelmää”**. Çıkarmışlar insanın önünä haydutlar, alarmışlar paralarını. Türlü özgä işlâr annadırdılar bu daa için.

(Kuroglu, 2011: 184)

Anlam meridyeninden geçen irsal-i mesel eksenini, söylem atmosferini belîğ bir doğrultuya çekmektedir. İfade şeridinde kuvvet ve güzellik katmak adına söz arasında vecize, hikmetli söz ya da deliller sunma eylemi, bu retorik izleğin tasviri boyutunu görünür kılmaktadır. Metinden yansıyan olay örgüsü, “korku daaları bekleer” ile “azlık gezmää – torlak gelmää” şeklinde temsil edilen meseller vasıtasıyla çağrışımsal bir boyut kazanarak söylem ikliminde estetiksel bir uyum yaratmaktadır.

6.

Dedä KORKUT. (*Bekilä*) Oolum, yaklaş buray! (*Bekil yaklaşêr*). Orada dooru hem pak canni bir Bey ol! Oguz halkımızın haliz oolu ol! Bizi hem kendini utandırma! (*kucaklêr Bekili, üç kere yanaklarından öper hem sonunda annısını da öper. Yaşlarını sileräk*) te şindi git. **Yolcuya yol yaraşır! Allah ileri sän da aardına!**

(Zanet, 2023: 465)

Metinde; bilinen, yaygın olarak kullanılan “Yolcuya yol yaraşır.” ve “Allah ileri sän aardına!” şeklinde dramatize edilen deyişlerden ilham alınmıştır. Söz konusu özlü sözlerin muhataba umut, cesaret ve güven vererek anlatı tepkimesine güç ve âhenk kattığı belirmiştir. Zaman kaybetmeden yola koyulmayı tasvir eden “Yolcuya yol yaraşır!” ile ilâhi güce sığınma, tevekkül etme ve manevi güce erişme olgusunu çağrıştıran “Allah ileri sän aardına.” sözleri irsal-i mesel kapsamında senkronize edilmiştir.

7.

Bir günü telefon açtı kayınçu. O bana hem kayınçuydu hem da kumiydi. O da, benimcileen, yaşardı êtajda, ama başladıydı ev yapmaa. Kayınçu aalaştı, ani hırsızlar çalêrlar materialları. Lafin bitkisindä teklif etti: “Versänä bana Tayfunu, orayı bekçi olsun!” Bän şaş-beş kaldım: “Nicä ölä veriyim Tayfunu?! O bana büyük bir dost hem kafadar oldu! Bunu yok nicä yapıym! Afet!” taa nelärsa lafedip, birazdana telefonu kapattım. Ama... var ye bir gagauz lafı: **“Gecä kuşu gündüz kuşunu enseer!”**

(Zanet, 2018: 449-450)

Todur Zanet’in “Tayfun” adlı yaratmasından alınan metinde; Tayfun isimli yavru köpeği sahiplenen konuşucunun, geçici bir süre dahi onu, başkasına vermek istemediği dikkati çekmiştir. Bu bağlamda senkronize edilen söylem tablosu, irsal-i mesel düzleminde sesletilmiştir. “Gecä kuşu gündüz kuşunu enseer!” atasözüyle etkin kılınan ifade, konuşucunun er geç Tayfun’u vereceği yönündeki olasılığı güçlendirmiştir. Çünkü bu meselin anlam yürüngesindeki mecâzi doku, köpeğin karşı tarafa verileceğine dair algıyı, daha doğrusu konuşucunun yakın çevresi tarafından ikna edileceği hususunu belirgin kılmıştır.

8.

Yazılêr, da, yorgun, fiçının yanında gölgecihtë dinnenmää yatêr. Dimitraş-Pıtraş butakım dinnenirkana, çarşı yolundan birkaç dev adamı geçärmış. Bunnar boyda büyümlêr, elleri kaaviymiş, hani var bir laf, **taşı siksinnar suyunu çıkaracêklar**, ama varmış tabeetleri daalarda bölüklän yaşasinnar hem şiretlik tarafını hiç bilmäzmişlär. Razgeldiyän bal fiçısını, devlär duruklanmışlar. Baksalar: fiçıda bir kiyat yapıştırılı. Kiyatta da yazılı nesä.

(Baboglu, 2011: 23)

Sanatçı, devleri fiziksel açıdan tasvir ederken irsal-i mesel sanatının estetiksel iz düşümünden faydalanmıştır. “Taşı siksinnar suyunu çıkaracêklar.” atasözünden hareketle, örnekleme reaksiyonuna kinestetik bir çağrışım yükleyen sanatçı, devlerin fiziksel açıdan kuvvetli, dinç ve her işin üstesinden gelebilecek yapıda olduklarını îma etmiştir.

9.

Bir bobanın varmış üç oolu. İkiisi akıllıymışlar, ama biraz korkakmışlar, üçüncüsü da delicäymiş. Gelmiş vakit bobasına ölsün. Ani var bir laf, **ölümlü dünnä**. Kendi o adam fukaraymış da yokmuş ne mülk uşaklarına braksın. Ölaceykana adam uşaklarına sımarlamış:

-Bän öldüktän sora her biriniz üçüm olunca benim mezarımı gecä da birär kerä beklesin. Oradan bän sizä verecäm paylarınızı...

(Baboglu, 2011: 31)

Metinde, yaşamsal olgunun geçiciliği ve üzerinde ölüm gerçeğinin var olduğu dünyayı sembolize eden “ölümlü dünnä” deyişine dikkat çeken sanatçı, anlamsal boyutu özgün bir imgeleme yeniden tasarlamıştır. Sanatçı, bu düşünsel tasarımı desteklemek gayesiyle irsal-i mesel yürüncesinden akseden söylem orbitalini sanatsal bir doğrultuya taşıyarak belîğ katmandaki saklı estetik birimleri canlı kılmıştır.

10.

Kendi gider ileri. Üç gün – üç gecä yol örüyor. Dördüncü günü padişahın portalarına etişer.
Bekleyici sorêr.

-Ne geldin, dâdo? Burayı olmaz yaklaşmaa.

-Kolverin beni, - demiş yolcu adam, - bân padişahın kızını alıştıracağam.

-Sauş ba, dâdo, - demiş bekleyici, - buray ne türlü dofturlar gelmedi, biri alıştırmadı da sän mi alıştıracağam?

-Alıştıracağam, - demiş dâdu.

Söleerlär padişaha, ani ölä-bölä adam geldi. Düşüner biraz padişah da deer saldatlarına.

-Kolverin gelsin bakalım. Beki da söyleyecek bir iş.

Ani var bir laf, **hasta olan kurt-kuştan da imdat aararmış**.

(Baboglu, 2011: 83)

Kişilerin çaresiz olduğu anlarda sıra dışı ve beklenmedik seçeneklere ya da çözüm önerilerine başvurabileceğini belirten sanatçı, bu düşüncesini “hasta olan kurt-kuştan imdat ararmış.” atasözüyle pekiştirmiştir. Metinde, hasta olan kız için zorda kalan padişah, normalde tercih etmeyeceği ya da mantıklı görmeyeceği seçeneği bile kabul etmeye mecbur kalmıştır. Bu durum irsal-i mesel sanatının anlam eksenleriyle birleşerek etkili ve anlaşılır bir tasarımla dizayn edilmiştir.

11.

Bir fukaara bir adam yannaşmış popaza çırak. Popaz bir cangaza, mınzalı erifmiş. İkidä-birdä fukaara çıraan izmetinä maana bulurmuş. Hem taa çok İvanı (çıraan adı İvanmış) törpülärmüş popaz ozaman, açan kefliymiş, ama keflenirmiş popaz her avşam.

Çırak onu hanidän brakacêymış, ama akı ileri almış da yokmuş şimdi ne yapsın. Boşuna mı ileri almış da yokmuş şimdi ne yapsın. Boşuna mı laf kalmış **“Baalı popaz kavga yapmaz”**. Ölä şimdi İvanın da işi gidärmüş.

(Baboglu, 2011: 121)

Metinde “Baalı popaz kavga yapmaz.” sözü vasıtasıyla darb-ı mesel yapılmış, anlam katmanına estetiksel bir betim yüklenmiştir. Bu anonim iletinin anlam sığasında, agresif tavırlı kimselerin çoğunlukla fiili bir eylem sergilemedikleri ya da tehditkâr sözler sarf edip çok konuşan bu tarz bireylerin gerçekte zarar vermeye meyilli olmadıkları kanısı öne çıkmaktadır. Sanatçı, olay ufkunda ileri sürdüğü düşünceyi desteklemek amacıyla örnekleme yoluna giderek söylem ritmini güçlü bir frekansla işlemektedir.

12.

Bu arada malika İvanna ilerledärdi soruşlarını: “Da, deersin, o şopar büüdü mü, mari?!”

“Büüdü! – hodulluklan dedi unuçası. – Ortalı aktarêr, tutamêêrım!”

“**Sarmısaa var**, kızım! İleri ihtârlar ölä dârdilâr!” – dedi babu.

(Zanet, 2023: 25)

Metnin anlam grafiğinden yansıyan “sarmısaa var” sözü, sağlıklı ve iyi yetişen bir çocuğun göze gelmemesi için söylenen ince bir deyişi sembolize etmektedir. Halk arasında yaygın bir kullanıma sahip olduğu anlaşılan bu özlü söz, irsal-i meselin düşünsel boyuta kattığı estetiksel uyumu görünür kılmaktadır.

13.

Sabah tez oldu. Sabahtan şendim hem keyfim erindäydi. Adetâ görä, içip sadâ çayın zavarkasını, işä gittim. Gün hızlı geçti. Beş buçukta, alıp karıyı iştan, yollandık Tayfunu evä almaa. Karı pek istemäzdi köpek geeri gelsin, zerä bir ayın içindä içerlerdän köpek kokusu kaybeldi, tüüleri da toplandı. Bän bunu annardım, ama laf var laf. **Tükürdün mü – yalama!** Ölä hep deyärdi bakam, ölä bän da kendimi üürettim. Bakmadaan kimä verdin o lafı: insana mı, hayvana mı! Burada sa laf verildi insan gibi, beki insandan taa akıllı, bir köpää! O lafı lääzımdı tutmaa!

(Zanet, 2018: 460)

Metinde “Tükürdün mü – yalama!” şeklinde tasarlanan atasözünden istifade edildiği ve ileri sürülen düşüncenin ikna edici yönde betimlendiği görülmüştür. Verdiği sözden geri dönmeme konusunda kararlı bir tutum sergileyen konuşucu, darb-ı mesel motifini realize ederek söylem yelpazesini güçlendirmiştir.

14.

Varmış altı kardaş, ani küsülüymüşlâr da biri-birinä gidip-gelmäzmişlâr. En büüyü pek fukaaraymış. Uşakları aaç yatırmış, aaç ta kalkırmış. Kimseydän ona yardım olmazmış: ne kardaşlardan karıların beterinä, ne dâ aalemdän. Ama bu da inatçaymış, yabancılardan bişey almazmış. Ama, nasıl deniler, **aalemin kahırını duysan, sän dâ taa insansın**. Nasıl-nicä, üç kardaş kararmış saklı yardım etsinnâr batüsuna. Gözletmiş bunnar, nezaman o geçecek dar köprüdän, da koymuşlar onun üstünä kesäylän para. Kendileri sä sıkılmış köprü altına.

(Ekonomov, 2019: 248)

Metinde; anlatıma renk ve âhenk katan, anlam çerçevesini güçlendiren ve düşünsel periyodu etkili kılan irsal-i mesel sanatı, “Aalemin kahırını duysan, sän dâ taa insansın.” deyişiyile estetik bir görünüm arz etmiştir. Sanatçı, öne sürdüğü düşünceyi, bilinen bir özdeyişle pekiştirerek ifade düzlemini kararlı bir yapıya dönüştürmüştür.

15.

Varmış pomeşik Kanazirskinin iki kızı ikiz eşleri hem başka da uşakları yokmuş. Bu uşaklardan tabiat, ayırmamış gözellii, ani var bir laf: **koç avucunnan baaşlamış**. Ana-boba da zengin varlınnan onnarı giydirip düzärmişlâr ölä, ki yokmuş nicä durup tâ bakmayasın bu iki su damnası gibi biri-birinä benzeyän açık güllerä. Penku hem karısı istemiştilâr, ki sevgili kızları “prost” dünnedän yırakta bulunsunnar da büüsünnâr ölä, ani ne görsünnâr, ne dâ bilsünnâr, ne olduunu o hayırsızlık.

(Baboglu, 1974: 29)

Metinde, iki kız çocuğunun sahip olduğu doğal güzelliğın betim tablosunu çizen sanatçı, “Koç avucunnan baaşlamış.” sözü ile darb-ı mesel yapmış, söylem piramidinde lirik ve estetik bir görünüm yaratmıştır. Sanatçı, bu deyişin metinle olan anlamsal uyumu aracılığıyla düşünsel iletiyi daha anlaşılır ve inandırıcı kılmayı amaç edinmiş, mübalağalı bir söylemin de estetik raylarını döşemiştir.

16.

Stoyannan Varka dayma buluřardılar. Nekadar taa sık görüřardilär, okadar taa çok istemäznilär ayırılmaa.

Derin duygular kapladıydı onnarı ölä, sansın bu dünnedä salt onnar ikisi yaşardı. Bu işleri zor saklamaa küüdä. Var bir laf, ani **“topraan da kulaa varmış”**. İřidilirdi, ani Varka aldadarmış adamını, yatarmış Stoyannan. Maaleci yan aazlı babular onnarın saklı seviřini meydana çıkardılar:

-İřittin mi, mari? İřitmedin mi? Mari, bu Varka, Kürkçü Todurun karısı, yatıp-kalkarmış Balaban Stoyannan, ne utanmaz karı!

(Karagançu, 2018: 27)

Metinde; hiçbir şeyin saklı kalmayacağı, gizli konuşulan şeylerin bile ansızın başkalarına ulaşabileceği ya da er geç duyulacağı uyarısını tasvirleyen düşünsel portre, “Topraan da kulaa varmış.” atasözünü desteklenmektedir. Sanatçı, ileri sürdüğü görüşü irsal-i mesel izleğiyle yoğurarak anlamsal boyuta varsıl bir imgelem yüklemektedir.

17.

Kırlangaç – saçak altında yaşayan kuşcaazdır. Herbir evdä o yuvasını yapmêr. İnsan ölä deer: **angı evin saçaanda kırlangaç yapınêr, o evä geler kismet hem kahırdan-beladan koruntu**. Ya bakalım, ne biz bileriz bu kuşcaaz için, angısınan, var nasıl demää, bir evdä yaşêrız.

İlkyazın, Paskellenin dolayında, açan hava isleecä yısınêr, gün duuar-duumaz, saçaan altında bir şamata kalkêr. Bu belli eder, ani yuvaların saabileri evinä geeri döndülär. Kırlangaçlar siirek diřtirerlär eski erini. Görürelär fenalık yada bişeydän ürkünürelär, ozaman onnar o evä geeri dönmezlär.

(Çebotar, 2021: 146)

Metinde; umudu, özgürlüğü, sadakati, kismet ve bereketi temsil eden kırlangaç kuşunun tasviri boylamda resmedildiği ve bu kuşa dair yaygın bir inanca dikkat çekildiği görülmektedir. İnsanları kaza ve beladan koruduğuna inanılan bu kuşun, yuva yaptığı eve şans getirdiği düşünülmektedir. Görüldüğü üzere, anonim bir imgeyle semantize edilen “Angı evin saçaanda kırlangaç yapınêr, o evä geler kismet hem kahırdan-beladan koruntu.” deyiři, anlamsal yörüngeyi estetiksel bağlamda aktivize ederek irsal-i mesel sanatını etkin kılmaktadır.

18.

Yol uzundu. Salonda yavaş-yavaş sus oldu. Arkadakılar uyudular. Birazdana lelü da uykuya daldı. Tayfun da sansın uyuklardı. Bän yavaşıcık koydum muzıkayı da, yola bakarak, kendi düşüncelerimä vardım. Yol boştu, raattı. O raatlık ta, bezbelli, yavařtan uyuklatmaa başlattı. Nicä var bir laf: **uykuya baas konmazsın!**

(Zanet, 2018: 451)

Metnin anlam şemasında örüntülenen “uykuya baas konmazsın!” sözü irsal-i mesel sanatının belığ ekseninde tasvir edilmiştir. Uykuyla bahse girilemeyeceği, onunla iddialaşmanın yersiz olacağı şeklinde anlamlandırılan edebi perspektif, ifade enlemine güçlü ve etkin bir kreasyonla yeniden tasarlamıştır.

19.

PAŞU (İvankaya). Hadi koyalım sofrayı, kızım.

İvanka kalkêr pattan. Babu İvana genä üüsürer, isteer su.

İVANKA (*doldurup çölmää*). Male, sän ne ölä sık üüsürmää başladın, ma? (*Uzadêr çölmää*).

BABU İVANA (*alıp çölmää, iêer birkaç yudum*). İhtârlık, kızım. Tez üşüyerim. Baksana ne ayaz dışarda. Bu yaşa etiştım, ama bölä derin kış taa görmedim. Boşuna ihtârlar demârdilâr, ani **bölä kışlar en zor vakıtlarda olurmuş**.

(Zanet, 2023: 338)

Metnin olay örgesinde, çetin geçen kış mevsimini betimleyen yaygın bir söylemin, irsal-i mesel kuşağındaki lirik yansıması göze çarpmaktadır. “Bölä kışlar en zor vakıtlarda olurmuş.” izleğiyle yaratılan çağrışımsal etki, anlamsal ufku varsıl bir yöne çekmektedir.

20.

PAŞU (*kaçarak yaklaşıp kocasına*). Sän ne yaptın, be Miti. O seni amazlaycek, be! Sibirdä çürüdecek, be! (*Savaşêr almaa tûfää*.)

MİTİ. Dur, Paşu! (*bir elinnän sarılêr karısının omuzlarına*.) Dur! Onun eri karşıda! (*Asêr tûfää eski erinä*.)

PAŞU (*aalayarak*). Uşaklar üsüz kalacak...

MİTİ (*yaklaşêr karısına*). Aalama, Paşu. Korkma, amazlamayacak. Sakınacak, zerä benim erimä oollarımız kalacak. Bilersin: **kan su olmaz!** O oollarımız büüdünän üüreneceklâr neçin bizi, gagauzları, aaçlaa kurban yaptılar. Son bukamızı kim aazımızdan aldı. Terimizlän kazandımız hergünkü ekmeemizi bizim neçin yok ettilâr. Bizi neçin köklemää savaştılar...

(Zanet, 2018: 509)

Metinde, ifade katmanını kuvvetlendiren irsal-i mesel olgusunun, “Kan su olmaz!” imgesiyle dramatize edildiği görülmüştür. Metin bağlamında tasarlanan bu retorik bağıntı, söylem şeridini güçlendirerek anlam piramidini sağlam bir temele dayandırmıştır. Dolayısıyla insanın kökünden atılamayacağı, köküne ihanet edemeyeceği kanısı belîğ bir üslupla semantize edilmiştir.

SONUÇ

Araştırma yürüngesinde sözbilimsel iz düşümün estetik raylarından geçen ve anlam frekansını güçlendiren “irsal-i mesel” örgesine vurgu yapılmıştır. Sezgisel aktarımdan ziyade; düşünsel temlerin reel etkileşimini senkronize eden bu sanatsal görüngü, “darb-ı mesel” veya “irad-ı mesel” dizgeleriyle de sembolize edilmiştir. Nesir ya da nazım düzleminde fikrî ufku güçlendirmek, söylem portresine güzellik katmak adına, söz arasında atasözü ya da onunla eşdeğer yöndeki deyişi, özlü sözü veya genel kabul gören bir kanıyı öne çıkarma işlemi, irsal-i meselin anlam evrenini desenlemiştir. Mecazi boylamdan yansıyan anonim motiflerin lirik çağrışımı olan bu sanatın, bellek şeridine kolayca bağlanarak ileri sürülen düşüncüyü pekiştirdiği dikkati çekmiştir. İrsal-i meselin yazınsal boyuttaki başarı grafiği ise iki gönderi arasındaki benzerlik oranına ve gücüne bağlı olup değişken bir yapı arz etmiştir.

Araştırmada, estetiksel tabloda resmettiği düşünsel portreyi etkili kılmak için irsal-i mesel motifini desenleyen sanatçının, saklı edebi yeteneğinin de gün yüzüne çıktığı görülmüştür. Sanatçı, ünlü deyişler ya da vecizeler yardımıyla ilettiği düşüncüyü metin bağlamında semantize ederek anlam periyodunu varsıl bir konuma taşımıştır. Üstelik bazı kalıp sözler vasıtasıyla işleyeceği mesele atıfta bulunarak hem sözün kinestetik dokusuna sanatsal bir yön çizmiş hem de okuyucunun dikkat algısını canlandırmıştır. İşlenen meselin anonim, özlü ve bilindik temeller üzerine inşa edilmesi ise bu sanatın ayırmsal sınırını görünür kılmıştır.

Çalışmada Gagauz edebî ikliminden akseden irsal-i mesel olgusunun, vurgulanmak istenen hissel dokunun yerini alarak o hissi etkin kıldığı göze çarpmıştır. “Asıl düşünce” ve “mesel” odaklı bir perspektifle modellenen bu belîğ yelpazenin, iki kutuplu estetik katmandan meydana geldiği görülmüştür. Okuyucuyu belli bir görüşe inandırma ve o görüşü, verilen misalle güçlendirme eylemi metin bağlamında resmedilmiştir. Ayrıca “örneklendirme” adıyla da nitelenen irsal-i meselin, Gagauz edebiyatında oldukça yaygın bir kullanım sergilediği görünüm arz etmiştir. Dolayısıyla, çağrışımsal bir temsilin özgün yansıması olan bu retorik bileşim, Gagauz yazın eksenini güçlendirerek söylem ritmine estetiksel bir âhenk yüklemiştir.

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**A RESEARCH ON MECHANICAL PROPERTIES AND HARDNESS OF POLYMER
COMPOSITES WITH FLY ASH, GLASS FIBRE POWDER AND ITS HYBRID
COMPOSITION**

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Abstract

Polymer materials have become one of the indispensable materials of human life day by day. Properties such as lightness, easy shaping, color-ability, corrosion resistance, good appearance and low cost provide great advantages to polymers. However, they also have disadvantages such as low strength and temperature resistance and scratch-ability. In order to improve the properties of polymers such as strength, rigidity and hardness, some fibers and some inorganic fillers added to polymers. Even the wastes of materials used in industry have been added to polymer materials in recent years. Glass fiber powders and fly ash fillers are some of them. In this study, composites were produced by adding additives such as glass fiber powder (GF-P) and fly ash (FA) to thermoset based unsaturated polyester (UP). Composite production was carried out using liquid resin casting technique. The hardness and bending performances of the test specimens were examined. Polyester compositions in composite productions were prepared as follows. Polyester + 1wt.% fly ash (UP+1FA), polyester + 50wt.% fly ash (UP+50FA), polyester + 50wt.% glass fiber powder (UP+50GF-P) and polyester + 1wt.% fly ash + 50wt.% glass fiber powder hybrid blend (UP+1FA+50GF-P). Flexural and hardness tests were performed on the composite test specimens. The properties of the composite materials such as flexural strength, flexural modulus, deformation ratio and hardness were investigated. In the study, when the polymer composites with 50wt.% fly ash filler and 50wt.% glass fiber powder additive were compared, it was found that the flexural modulus, flexural strength and deformation ratio of the polyester composite with glass fiber

powder additive were higher. The highest flexural strength, the highest deformation ratio and the lowest flexural modulus values were obtained in the polyester composite with 1wt.% fly ash filler. In the hybrid composite of 1wt.% fly ash + 50wt.% glass fiber powder (UP+1FA+50GF-P), the flexural modulus and deformation ratio values were obtained between UP+1FA and UP+50GF-P additive composite values.

Keywords: Glass fiber powder, fly ash, hybrid, composite, polyester, polymer, mechanical properties

1. INTRODUCTION

Unsaturated polyester resin, a thermoset class, is a type of polymer widely used in various industries due to its versatile properties. It is formed through the reaction of a dibasic acid with a diol, forming a polyester backbone with unsaturated bonds that can undergo cross-linking reactions that provide the thermoset structure. The cross-linking process is initiated by a catalyst and accelerator. As a result, a three-dimensional network structure is formed that gives the unsaturated polyester resin its strength and durability. Unsaturated polyester resin is known for its very good corrosion resistance, high strength-to-weight ratio and easy processing properties. It can be easily molded into different shapes and sizes. These properties make polyester popular in the manufacturing of parts for use in the automotive, marine, aerospace and construction industries. In addition, to improve the mechanical properties and performance of unsaturated polyester resins, various strength enhancing additives such as glass fiber (Mallick, 2000), natural fiber and aramid fiber (Kumar, 2020; Sanjay et. al., 2018; Croitoru, 2018) or carbon fiber (Raja et. al. 2019), as well as basalt (Pavlovic et. al., 2019), silicon dioxide, calcium carbonate (Liu et. al, 2024; Croitoru, 2018; Xian et. al., 2023), mica, kaolin (Tsai et. al, 2009), titanium dioxide, wollastonite, talc, aluminum oxide, fly ash (Sugiman et. al., 2013; Guhanathan et. al, 2004; Erdogmuş et. al., 2022), glass balls and glass spheres (Erdogmuş et. al., 2022), silicon dioxide, talc, kaolin (Tsai et. al, 2009) and some nano-clay additives. Flexural strength is of great importance in sectors such as aircraft/space industry, construction, automotive and maritime, where materials are exposed to many different mechanical stresses. Unsaturated polyester resins with high bending strength are used for panels, beams, etc. It can be used in many structural applications that require resistance to bending forces. The value that measures the resistance of unsaturated polyester resin to bending and stretching is called Flexural strength. This value generally varies between 60-80 MPa in polyester materials. The elastic modulus of unsaturated polyester resin is also one of the most important factors. Having a high elastic modulus, this product can be used for components that require strength and stability, such as load-bearing structures and structural supports. In general, the elastic modulus contributes to demanding applications where mechanical performance and stiffness are important. Hardness plays an important role in many industrial environments where materials are exposed to harsh environments. Unsaturated polyester resin with the appropriate degree of hardness can be used to produce products requiring scratch, impact and abrasion resistance.

In short, in order to improve the mechanical properties of materials and use them in industry, it is necessary to know the properties of the materials. Or it is necessary to prepare a material composition with the desired properties. Each additive used in polyesters affects the properties of the material. In this study, glass fiber powder created by grinding glass fibers and fly ash produced by burning pulverized coal in furnaces in thermal power plants and kept in electro-filters in chimneys were used as additive materials. Unsaturated polyester resin was

used as the main matrix material. The bending and hardness properties of the composites were examined by mixing different proportions of additives into the polyester resin.

2. MATERIAL AND METHOD

2.1.1. Material

Two different additives were used in the production of thermoset polyester based composite material. One of them is fly ash, which is a waste material generated in the chimneys of thermal power plants and was obtained from Medcam Global/Istanbul/Turkey. The second additive material is glass fiber powder with a particle diameter of approximately 11 μm and a fiber size of approximately 1 mm and was purchased from Fiber Glass fiber Co./Balıkesir/Turkey. Polyester main matrix material is terephthalic type unsaturated polyester resin and was obtained from Boytek/ Istanbul/Turkey. In order to form crosslinking, 2% Methyl Ethyl Ketone Peroxide (MEK-P) was used in the polyester resin and was obtained from Boytek/ Istanbul/Turkey. In order to accelerate crosslinking, 1% cobalt octoate was added to the polyester mixture.

2.2. Preperation of Composites

Fly ash and glass fiber powder were used in the production of composite test specimens and produced at different ratios. In the research, four different compositions of polyester composites with 1wt.% and 50wt.% fly ash additives, 50wt.% glass fiber powder and hybrid composites with 1wt.% fly ash/50wt.% glass fiber powder additives were produced. Flexural and hardness tests were performed on the specimens. Silicone rubber molds designed according to ISO standards were used in the production of test specimens. Resin casting technique was used in the production of polyester based composite materials. For composite production, liquid resin, cobalt octoate catalyst and 2wt.% Aerosil thickener were first mixed in a mechanical mixer. Then, depending on the additive ratio, fly ash additives and/or glass fiber powder additive were added to the liquid resin/cobalt mixture and mixed in a high speed mechanical mixer for 30 minutes. Finally, MEK-P hardener was added to the resin/cobalt/additive mixture, mixed for 30 seconds and poured into silicone molds. After the test specimens were kept in the molds for a certain period of time, they were kept in an oven at 70°C for 1 hour. Finally, the test specimens were conditioned at room temperature of 23°C and 50% humidity for a certain period of time.

2.3. Tests

2.3.1. Flexural Test

Three-point bending tests of polyester composites filled with 1wt.% and 50wt.% fly ash and hybrid composites doped with 50wt.% glass fiber powder and 1wt.% fly ash/50wt.% glass fiber powder were carried out on a Zwick Roell Z250 tensile testing machine. Figure 1 shows the schematic of the three-point bending test machine. A bending speed of 5 mm/min was used in the flexure tests. Flexural test specimens were prepared in accordance with ISO 14125 standards. At least five test specimens were tested for each composite and the data obtained were recorded on computer. Then the arithmetic mean of the data obtained was taken. The flexural strength of the composite materials was calculated using the following formula. In the equation; P is the applied load (N), L is the span between supports (mm), b is the width (mm) and h is the thickness (mm).

$$\sigma = \frac{3PL}{2bh^2} \quad (1)$$

Also, in the flexural test, the deformation rate in bending was calculated using the following formula. Where ε is the deformation rate (strain) in bending, h is the specimen thickness (mm), D is the maximum bending of the center of the specimen (mm) and L is the span between the two supports.

$$\varepsilon = \frac{6Dh}{L^2} \quad (2)$$

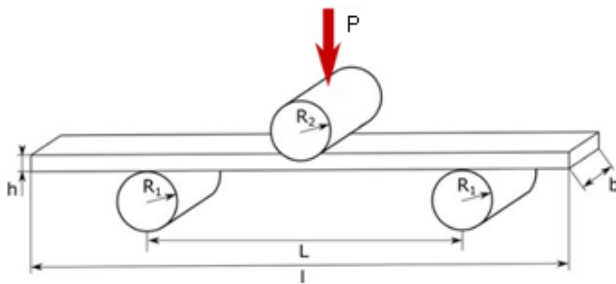


Figure 1. Schematic test rig for three-point bending test (ISO14125)

2.3.2. Hardness Test

Barcol hardness tests of polyester composites filled with 1wt.% and 50wt.% fly ash and hybrid composites filled with 50wt.% glass fiber powder and 1wt.% fly ash/50wt.% glass fiber powder were carried out in a standard Barcol hardness tester. Hardness measurements of polyester composites were measured in accordance with ASTM D2583 standard. In the hardness measurement process, Barcol Hardness was measured from at least 10 different points on the composite surface and the arithmetic average of these values was taken.

3. RESULTS AND DISCUSSION

Figure 3 shows the variation of flexural strength of polyester composites filled with 1wt.% and 50wt.% fly ash and hybrid composites filled with 50wt.% glass fiber powder and 1wt.% fly ash/50wt.% glass fiber powder. As can be seen in the figure, the highest flexural strength was obtained in UP composite with 1wt.% fly ash additive with a value of 102 MPa. Then 70.6 MPa value was obtained in UP composite with glass fiber powder additive. The lowest flexural strength was obtained in UP composite with 50wt.% fly ash additive with a value of 37.8 MPa. The flexural strength of the hybrid composite with 1wt.% fly ash/50wt.% glass fiber powder was determined as 54.4 MPa. It was observed that the flexural strength of the composite decreased significantly (62.9%) when the fly ash content in the polyester was increased from 1wt.% to 50wt.%. The hybrid structure was not effective in increasing the flexural strength of the composite. The shape of the fly ash particles and the small size of the glass fiber powder did not have much effect on the flexural strength.

The variation of flexural modulus values of polyester composites doped with 1wt.% and 50 wt.% fly ash and hybrid composites filled with 50 wt.% glass fiber powder and 1 wt.% fly ash/50wt.% glass fiber powder is given in Figure 4. As can be seen in the figure, the highest modulus of elasticity was obtained in the 50wt.% glass fiber powder filled composite (7680 MPa), while the modulus of elasticity of the 50wt.% fly ash filled composite was 6220 MPa. The elastic modulus of the composite with 1wt.% fly ash was observed to be the lowest with a value of 2520 MPa. The flexural modulus value of the hybrid composite containing 1wt.% fly ash and 50wt.% glass fiber powder was determined as 6010 MPa. In other words, this value was obtained between the flexural modulus values of hybrid composites containing 1wt.% fly ash and 50wt.% glass fiber powder. Considering that the flexural modulus value of pure polyester is 2020 MPa, both fly ash additives and glass fiber powder additives increased the modulus of elasticity of composite materials. In other words, it caused the stiffness of the composites to increase. This can be explained by the fact that the additives added to the polyester resin enter between the polymer chains and limit their movement.

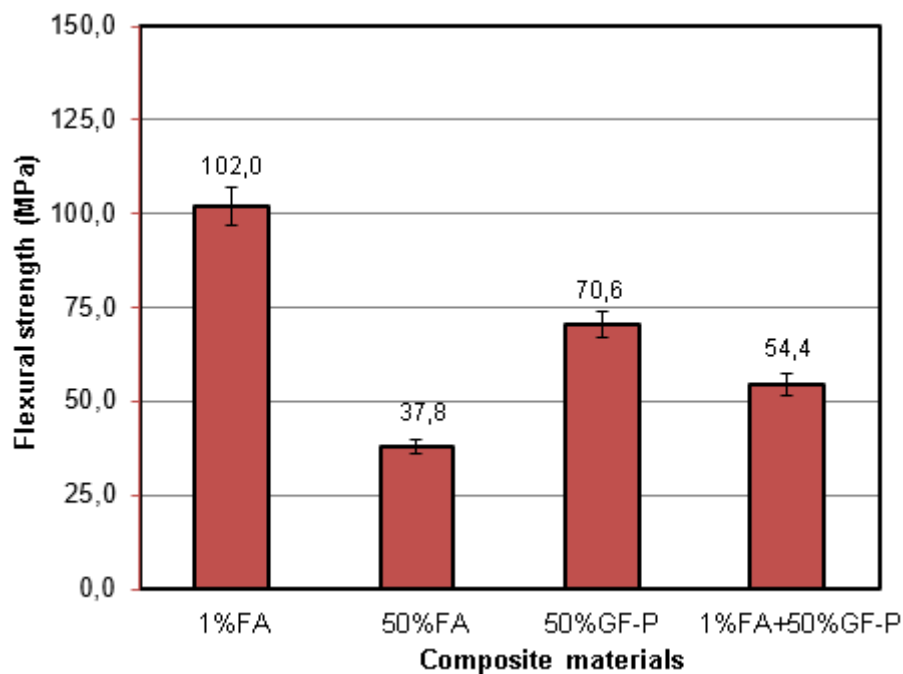


Figure 3. The relationship between flexural strength and polyester composites filled with fly ash, glass fiber powder and its hybrid

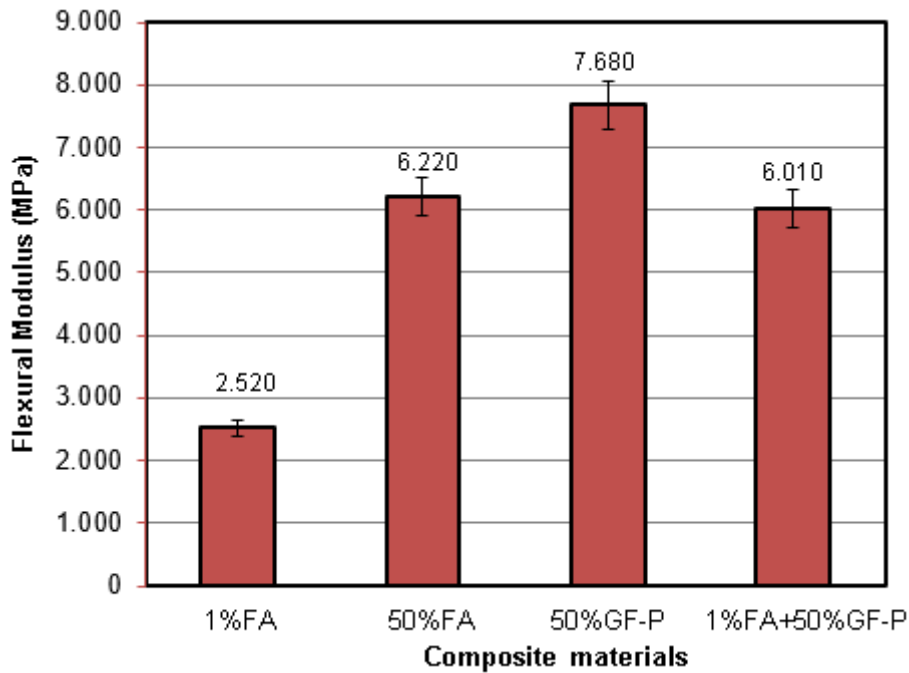


Figure 4. The relationship between flexural modulus and polyester composites filled with fly ash, glass fiber powder and its hybrid

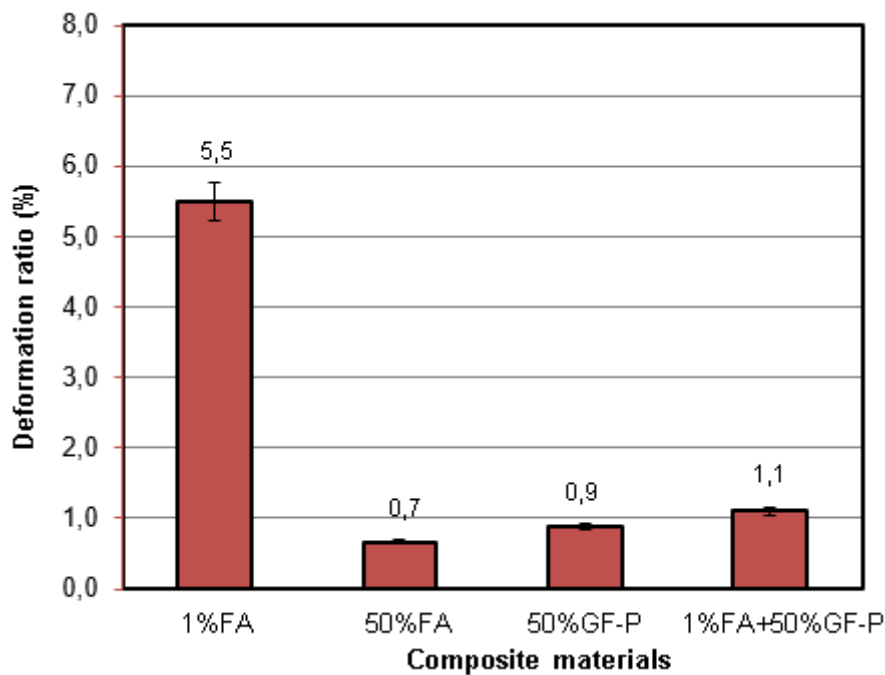


Figure 5. The relationship between deformation ratio and polyester composites filled with fly ash, glass fiber powder and its hybrid

Figure 5 shows the variation of the deformation ratio in bending of polyester composites filled with fly ash at different ratios (1wt.% and 50wt.%) and hybrid composites filled with 50wt.% glass fiber powder and 1wt.% fly ash and 50wt.% glass fiber powder. As can be seen in the figure, the deformation rate of the composite decreased significantly as the fly ash content in

the polyester base matrix increased. The highest deformation rate was obtained in the composite containing 1wt.% fly ash with a value of 5.5%, while the lowest deformation rate was obtained in the composite containing 50wt.% fly ash with a value of 0.7%. The deformation rate of the composite with 50wt.% glass fiber powder was 0.9%. The deformation rate of the hybrid composite was determined as 1.1%. These data obtained are consistent with the flexural modulus values of the materials given in Figure 4. In other words, the high value of the modulus of elasticity indicates that the stiffness of the materials used in the experiments increases and becomes brittle. This causes the deformation rate to increase. In other words, it shows that flexural modulus and deformation ratio values are compatible with each other.

Figure 6 shows the variation of hardness values of polyester composites doped with fly ash at different ratios by weight (1% and 50%) and hybrid composites filled with 50wt.% glass fiber powder and 1wt.% fly ash and 50wt.% glass fiber powder. In previous studies, the Barcol hardness value of pure polyester composite was determined as 26.3. As seen in the figure, the highest hardness value (52 Barcol) was obtained in the composite with 50wt.% glass fiber powder additive, while the hardness value of the composite with 50wt.% fly ash additive was obtained as 50 Barcol. The hardness value of the polyester-based composite with 1wt.% fly ash additive was determined as 30.1 Barcol. The hardness value of the hybrid composite containing 1wt.% fly ash and 50wt.% glass fiber powder was determined as 50.8 Barcol. The hardness value of the hybrid composite was obtained separately between the hardness values of the composite containing 1wt.% fly ash and the composite containing 50% glass fiber powder. It was also observed that the stiffness values increased with the increase in the additive ratio in polyester. At the same time, the increase in stiffness is consistent with the flexural modulus values given in Figure 4.

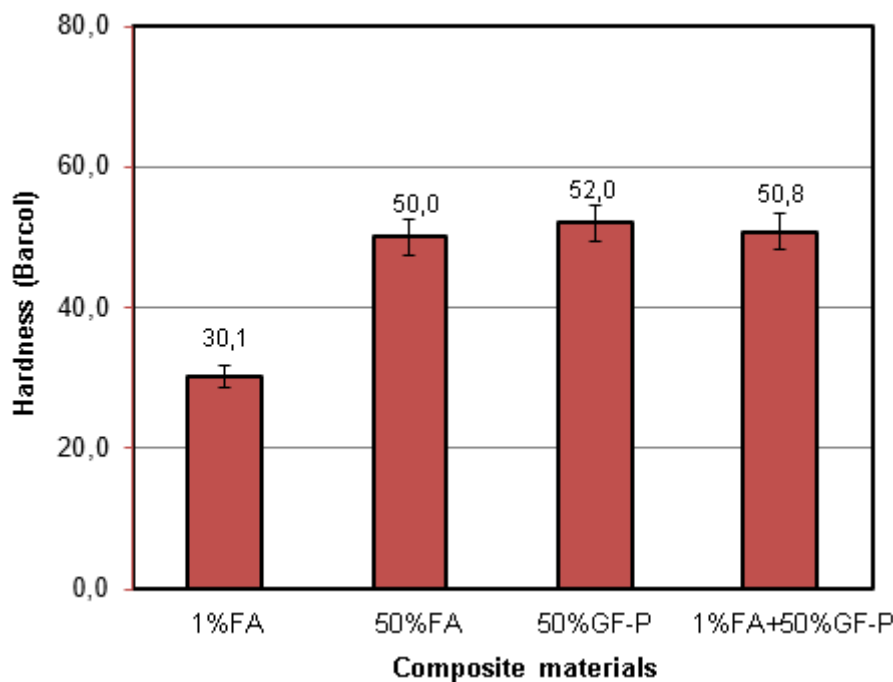


Figure 6. The relationship between hardness and polyester composites filled with fly ash, glass fiber powder and its hybrid

4. CONCLUSIONS

The following conclusions were drawn from the experimental studies.

- The flexural modulus and hardness values of the composite materials increased as the fly ash additive ratio and glass fiber powder ratio added to the polyester base matrix increased.
- The highest flexural modulus and hardness values were obtained in polyester composite with 50% glass fiber powder additive with 7680 MPa and 52 Barcol values, respectively.
- The flexural strengths of 1wt.% fly ash filled composite and 50wt.% glass fiber powder filled composites were 59.6% and 10.4% higher than pure polyester, respectively. It was observed that the flexural strength of the hybrid composite was 14.8% lower.
- The addition of high filler fillers (fly ash and glass fiber powder) to the polyester increased the stiffness and stiffness of the composite, but decreased the flexural modulus and deformation ratio.
- Except for flexural strength, flexural modulus, stiffness and deformation ratio values of the hybrid composite material were obtained between the values of composites with 1wt.% fly ash additive and 50wt.% glass fiber powder additive.

Acknowledgments

The authors would like to thank SUBOR Pipe Co. for their material, production and testing support.

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**FEN BİLİMLERİ ÖĞRETMENLERİNİN KÜRESEL İKLİM DEĞİŞİKLİĞİNE
İLİŞKİN GÖRÜŞLERİ ***

VIEWS OF SCIENCE TEACHERS ON GLOBAL CLIMATE CHANGE

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ÖZET

Küresel iklim değişikliği, insanlığın daha önce karşılaşmadığı riskleri barındıran, çözümünün yine insanlara bağlı olduğu toplumsal bir sorundur. Doğal çevreye yönelik ilgi ve duyarlılık, ulusal ve uluslararası düzeyde artmakta ve çevre bilincinin kazandırılmasında bilgi edinmenin en önemli çözüm yolunun eğitim olduğu görüşü yaygınlaşmaktadır. Çünkü toplumları etkileyen küresel çevre sorunlarının çözümü için insanların istenilen düzeye getirilmesinde eğitim hayati bir rol oynayabilir. Buna bağlı olarak, çalışmanın amacı fen bilimleri öğretmenlerinin küresel iklim değişikliğine ilişkin görüşlerini ortaya çıkarmaktır. Çalışma nitel araştırma yöntemlerinden fenomenoloji deseni ile gerçekleştirilmiştir. Çalışmaya Kayseri ilinde bulunan farklı ortaokullarda görev yapan 10 fen bilimleri öğretmeni katılmıştır. Öğretmenlerle yapılan yarı yapılandırılmış görüşmelerde, araştırmacılar tarafından hazırlanan veri toplama aracı kullanılmıştır. Elde edilen veriler içerik analizi ile çözümlenerek bulgular oluşturulmuştur. Çalışma kapsamında elde edilen bulgulara göre; öğretmenler küresel iklim değişikliğini çok boyutlu, insan hayatını ve diğer canlıların hayatını tehdit eden, sağlık sorunlarına ve çevre sorunlarına neden olan küresel bir tehdit olarak tanımlamışlardır. Küresel iklim değişikliği ile mücadelede insanların küçük yaşlardan itibaren farkındalık ve bilgi düzeylerinin artırılmasında eğitim en önemli role sahip olduğu, bu sorunun insanlara anlatılması, küçük yaşlardan itibaren bu konu hakkında bireylerin bilgilendirilmesi ve hepsinden önemlisi halkın tüm kesimlerinde farkındalık yaratılması gerektiği sonuçlarına ulaşılmıştır. Ayrıca katılımcılar küresel iklim değişikliği konularının fen bilimleri müfredatında daha kapsamlı, öğrenciye yaparak yaşayarak öğrenme faaliyetleri sunulmasına olanak sağlayacak etkinliklerin kazanımlar içerisinde verilmesi gerektiğini belirtmişlerdir.

Anahtar Kelimeler: Küresel İklim Değişikliği, Fen Öğretimi, Fen Bilimleri Öğretmenleri, Fenomenoloji

* Bu çalışma, ikinci yazar danışmanlığında birinci yazar tarafından hazırlanan yüksek lisans tezinden üretilmiştir.

ABSTRACT

Global climate change represents a societal issue that encapsulates risks previously unencountered by humanity and requires solutions reliant on human intervention. The rising national and international concern for the natural environment underscores the prevalent belief that education is a critical solution for fostering environmental awareness. Given that education can play a crucial role in enabling people to address global environmental challenges, this study aims to explore the views of science teachers on global climate change. The study employs qualitative research methodologies, specifically a phenomenological design, and involves ten science teachers working in various middle schools in Kayseri, Turkey. Semi-structured interviews conducted with these teachers utilized a data collection instrument developed by the researchers. The data were analyzed using content analysis to construct findings. According to the findings of the study, teachers describe global climate change as a multifaceted global threat that endangers the lives of humans and other species, leading to health and environmental issues. They emphasized that education plays a vital role in raising awareness and knowledge from a young age to combat climate change. It was concluded that individuals need to be educated about this issue from early childhood, and more importantly, awareness should be created among all segments of the population. Additionally, participants suggested that the science curriculum should include more comprehensive activities that allow experiential learning, thus enabling students to engage actively with the topic of global climate change.

Keywords: Global Climate Change, Science Education, Science Teachers, Phenomenology

GİRİŞ

Küresel iklim değişikliği, sanayi ve ulaşımda gerekli enerjinin sağlanması için fosil yakıtların kullanılması, ormanların tahrip edilmesi ve birçok insan faaliyetleri sonucunda atmosferde doğal olarak bulunan metan (CH₄) ve karbon dioksit (CO₂) gazlarının yanı sıra sentetik kimyasalların (kloroflorokarbon-CFC) artması sonucu meydana gelen sera etkisi ile dünyamızın ortalama sıcaklığındaki artış olarak tanımlanabilir (Aydın, 2014). Özellikle son zamanlarda dünyanın farklı bölgelerinde meydana gelen olağanüstü hava olayları, buzulların hızla erimesi, küresel iklim değişikliğinin etkilerini ve boyutunu hissettirmektedir.

İklim değişikliği, insanlığın karşı karşıya olduğu en yaygın küresel çevre sorunudur. Nüfus artışı ve teknolojik gelişmelerle beraber, insanlar temel ihtiyaçlarını karşılamakla yetinmemiş, bitmek bilmeyen isteklerini sınırlı kaynakları kullanarak karşılamaya çalışmıştır. Bu süreçte doğal kaynakların kullanılması ve atık miktarının artması da birçok çevre sorununu ortaya çıkmasına neden olmuştur (Tıraş,2012).Nüfusun hızla artmasıyla insanların besin ihtiyacı artmış ve artan bu ihtiyaçları karşılamak için verimli tarım arazileri, kentleşme amacıyla yok edilmiş ve kentlere göç etmekle birlikte şehirlerde çarpık yapılaşmaların oluşması sorunu, doğal dengenin bozulmasını hızlandırmıştır (Akgün, vd.,2017).

Çevrenin vazgeçilmez unsuru olan insan da her geçen gün artan çevre sorunlarından doğal olarak etkilenmektedir. Çevre sorunlarının temelinde, insanların çevre hakkında bilgilerinin, çevreye yönelik tutumlarının, değer ve farkındalıklarının düşük olması yer almaktadır. İnsan ve çevre arasındaki bağlantının daha sağlıklı yürütülmesi için çevre bilincine sahip ve çevreye karşı duyarlı bireylerin yetiştirilmesi gereklidir. Çevre sorunlarına karşı farkındalığa, bilince, tutuma ve duyarlı davranışlara sahip bireyleri yetiştirmek için etkili bir çevre eğitimi gereklidir.

(Akgün ve Atmaca, 2015; Akgün vd., 2017; Aydın, 2014; Ergin, Akbay, Özdemir ve Uzun, 2017; Kışoğlu, vd., 2016).

Küresel ısınma ile birlikte meydana gelen küresel iklim değişikliği, çevreyi ve dolayısıyla canlı cansız bütün ekosistemi etkilemektedir. Doğadaki değişimin olumsuz sonuçlarının farkında olamayan bireyler, doğal dengenin korunması için yapılması gereken davranışları da gösterememektedirler (Timur & Yılmaz, 2011). Bu davranış ailede başlayıp eğitimle kazandırılabilir bir zaman dilimini kapsamaktadır. Bu kapsamda özellikle öğretmenlerin bakış açısı ve çevre eğitimi konusunda bilgi ve becerilerinin önemi ortaya çıkmaktadır.

Alanyazın incelendiğinde bugüne kadar öğretmenlerin ve öğrencilerin küresel iklim değişikliği ve çevre sorunları ile ilgili bilgi düzeylerini ölçen ulusal ve uluslararası alanda yapılan birçok araştırma bulunmaktadır. Bu araştırmaların bazıları ozon tabakası (Boyes, Chambers and Stanisstreet,1995;Bozkurt ve Aydoğdu, 2004;Pekel, Kaya ve Demir,2007),bazıları sera etkisi, küresel ısınma ve iklim değişikliği (Biricik,2008;Çavdar,2007;Darçın, Bozkurt, Hamalosmanoğlu ve Köse,2006;Devine-Wright and Fleming, 2004; Kadioğlu,2008;Koulidis and Christidou,1999;Lester, Ma, Lee and Lambert,2006; Meadows and Wiesenmayer,1999;Özcan ve Kayman,2008;Öztürk,2002) ve bazıları ise genel çevre bilgisi ile ilgilidir(Sağır,Aslan ve Cansaran,2008). Küresel iklim değişikliğine ilişkin Fen Bilimleri öğretmenlerinin düşüncelerini ortaya koyan çalışmaların sayısı ise oldukça sınırlıdır. Bu bağlamda bu çalışmada Fen Bilimleri öğretmenlerinin küresel iklim değişikliğine ilişkin görüşlerini incelemek amaçlanmış ve Fen Bilimleri Öğretim Programında yer alan küresel iklim değişikliğini esas alan konularda Fen Bilimleri öğretmenlerinin bilgi düzeyleri ve farkındalıkları, yapılan görüşmelerle tespit edilmeye çalışılmıştır.

YÖNTEM

Araştırmanın Modeli

Bu çalışmada nitel araştırma yöntemlerinden olan olgubilim (fenomenoloji) deseni kullanılmıştır. Olgubilim, farkına vardığımız fakat derinlemesine ve detaylı bir bilgiye sahip olmadığımız olgulara odaklanmaktır (Yıldırım ve Şimşek, 2016).Fenomenolojik çalışmaların temel amacı, bir olguyla ilgili bireysel deneyimleri, daha genel bir seviyeye çekmektir(Creswell, 2007). Bu çalışmada, fen bilimleri dersini yürütmekte olan öğretmenlerin, küresel iklim değişikliğine ilişkin görüşleri incelenecektir.

Çalışma Grubu

Fenomenolojik modelde desenlenen araştırmanın çalışma grubu, Fen Bilimleri öğretmenlerinin küresel iklim değişikliğine ilişkin görüşlerini belirlemeyi amaçladığı için amaçlı örnekleme yöntemiyle seçilen öğretmenlerden oluşmaktadır. Araştırmanın çalışma grubu, amaçlı örnekleme yönteminden biri olan ölçüt örnekleme ile seçilmiştir. Çalışma grubu Kayseri’de görev yapan beşi kadın,beşi erkek olmak üzere 10 Fen Bilimleri öğretmeninden oluşturulmuştur. Bu çalışmada katılımcıların belirlenmesinde; Fen Bilimleri dersi öğretmeni olma ve programda iklim değişikli ile ilgili konuları öğrencilerine anlatmış olması ölçütleri dikkate alınmıştır.

Verilerin Toplanması ve Analizi

Çalışmada veri toplamak için Fen Bilimleri öğretmenlerinin küresel iklim değişikliğine ilişkin görüşlerini belirlemeyi amaçlayan bir görüşme formu hazırlanmıştır. Görüşme formunun hazırlanmasında konuya ilişkin daha önce hazırlanan görüşme formları ve fen bilimleri dersi 5. ve 8. sınıf kazanımlarından yararlanılmıştır. 10 sorudan oluşan yarı yapılandırılmış görüşme formu, fen eğitim alanında uzman iki akademisyene iletilmiş ve uzman görüşleri alınmıştır. Uzman görüşlerinden elde edilen veriler doğrultusunda gerekli düzeltmeler yapılmıştır. Katılımcılarla yaklaşık 20-25 dakika süren görüşmeler yapılarak sesleri kaydedilmiştir. Kaydedilen görüşmeler daha sonra bilgisayar ortamında MS Word belgesi haline getirilmiş ve ifadeler analiz edilmiştir. Bu analizde, benzer verilerden kodlar oluşturulmuş ve temalar elde edilmesi amaçlanmıştır (Yıldırım ve Şimşek, 2016). Kod ve kategoriler araştırmacılar arasında uzlaşılarak oluşturulmuş ve bulgular şeklinde sunulmuştur.

BULGULAR

Küresel İklim Değişikliğinin Nasıl Tanımlandığı Temasına Yönelik Bulgular

Bu bölümde fen bilimleri öğretmenlerinesorulan “Küresel İklim Değişikliğini Nasıl Tanımlarsınız?” sorusu ile toplanan veriler sunulmuştur (Tablo 1).

Tablo 1.

Küresel İklim Değişikliğini Nasıl Tanımladıklarına İlişkin Öğretmen Görüşleri

Kodlar	Frekans	Katılımcılar
Dünya sıcaklığının artması	5	Ö1, Ö5, Ö6, Ö7, Ö9
Hava olaylarındaki değişiklikler	4	Ö2, Ö4, Ö8, Ö10
Geniş çaplı iklim değişikliği	2	Ö3, Ö7
Mevsim sürelerinin değişmesi	2	Ö5, Ö8
İklim dengesinin bozulması	1	Ö6

Tablo 1 incelendiğinde, katılımcıların bazılarının tanım için birden fazla ifade kullandıkları görülmektedir. Katılımcılardan Ö1, Ö5, Ö6, Ö7 ve Ö9 küresel iklim değişikliğini dünyanın sıcaklığının artması olarak tanımlarken, Ö5 aynı zamanda küresel iklim değişikliğini mevsim sürelerinin değişmesi olarak da tanımlamıştır. Bu katılımcılardan Ö6 düşüncesini “Küresel iklim değişikliğini şöyle tanımlarım: öncelikle büyük bir sorun olduğunu söylemek isterim. Dünyadaki iklim dengesinin bozulması bu bozulmadan dolayı da ekosistem ve insanların etkilenmesidir. Küresel iklim değişikliği denilince aklıma hep dünya sıcaklığının arttığı, küresel ısınma aklıma gelir.” şeklinde ifade etmiştir.

Küresel İklim Değişikliğinin Fen Bilimleri Dersi Öğretim Programındaki Yeri Temasına Yönelik Bulgular

Bu bölümde fen bilimleri öğretmenlerinesorulan “Küresel İklim Değişikliğine Fen Bilimleri Dersi Öğretim Programında Yeterince Yer Verildiğini Düşünüyor musunuz?” sorusu ile toplanan veriler sunulmuştur (Tablo 2).

Tablo 2.

Küresel İklim Değişikliğine Fen Bilimleri Dersi Öğretim Programında Yeterince Yer Verilme Durumuna İlişkin Öğretmen Görüşleri

Kodlar	Frekans	Katılımcılar
Yeterince yer verilmiyor	6	Ö1, Ö6, Ö7, Ö8, Ö9, Ö10
Yeterince yer veriliyor	4	Ö2, Ö3, Ö4, Ö5

Tablo 2'ye göre katılımcılardan çoğunluğu fen bilimleri dersi öğretim programında küresel iklim değişikliği konularına yeterince yer verilmediğini düşündüklerini ifade etmektedirler. Küresel iklim değişikliği konularına fen bilimleri dersi öğretim programında yeterince yer verilmediğini belirten Ö1 kodlu katılımcının düşüncesi ise şu şekildedir: "Gereken önemin verilmediğini düşünüyorum. Derslerimiz kazanımların doğrultusunda ilerliyor ve kazanımlarımızda bu konuya yeterince yer verilmiyor. Ayrıca müfredatın yoğun olmasından dolayı detaya inmek istesek bile inemiyoruz yüzeysel geçiyoruz bu konuları." Programda küresel iklim değişikliği konularına yeterince yer verildiğini düşünen katılımcılardan Ö2 kodlu katılımcı "Fen müfredatında 5. ve 8. sınıflarda ilgili kazanım yer almaktadır. Aslında yeterince yer verildiğini düşünüyorum. Gerek öğretmen anlatımıyla, gerek EBA platformuyla öğrencilere görsel olarak anlatıldığını düşünüyorum." şeklinde düşüncesini belirtmiştir.

Fen Bilimleri Dersi Öğretim Programına Yönelik Öneriler Temasına Yönelik Bulgular

Bu bölümde fen bilimleri öğretmenlerine sorulan "Küresel İklim Değişikliği Konuları Fen Bilimleri Dersi Öğretim Programında Nasıl Yer Almalıdır? Önerileriniz Nelerdir?" sorusu ile toplanan veriler sunulmuştur (Tablo 3).

Tablo 3.

Küresel İklim Değişikliği Konuları Fen Bilimleri Dersi Öğretim Programında Nasıl Yer Almalıdır Sorusuna İlişkin Öğretmen Görüşleri

Kodlar	Frekans	Katılımcılar
Kazanım süresini artırma	5	Ö1, Ö3, Ö6, Ö8, Ö10
Ekoloji ünitesi ekleme	4	Ö1, Ö4, Ö7, Ö9
Bölgesel müfredat	2	Ö2, Ö8
Her sınıf düzeyinde kazanım	2	Ö3, Ö10
Materyal tasarlama	2	Ö6, Ö7
Sanal uygulamalar	1	Ö6
Etkinlikleri artırma	1	Ö5

Tablo 3'e göre katılımcıların Fen Bilimleri Dersi Öğretim Programında küresel iklim değişikliği konularının nasıl yer alması gerektiğine yönelik çeşitli öneriler sundukları görülmektedir. Bu katılımcılardan Ö1, Ö4, Ö7 ve Ö9 fen bilimleri dersi içerisinde ekoloji küresel iklim değişikliğinin ve çevre sorunlarının yer aldığı bir ünitenin olması gerektiğini açıklamışlardır. Ö4 düşüncesini "Ekoloji konulu ünite konulabilir fen bilimleri dersi içerisine. Bu ünite içerisinde çevre sorunları, küresel ısınma, küresel iklim değişikliği gibi konulara daha detaylı yer verilebilir." şeklinde ifade etmiştir. Diğer taraftan fen bilimleri dersi müfredatında küresel iklim değişikliği kazanımlarının süresinin yetersiz olduğunu ve her sınıf düzeyinde

olması gerektiğini vurgulayan Ö3 düşüncesini;“Okulda birçok şey teoride kalıyor. Bu konuyla ilgili kazanım süresi daha da artırılarak öğrencilerin de içinde bulunacağı topluma hizmet çalışmaları şeklinde yürüteceğimiz çeşitli projelerin olacağı konuma sokulabilir. Ayrıca kazanım olarak 5. ve 8. sınıflarda yer almakta bu kazanımların her sınıf düzeyinde olması gerekmektedir.” şeklinde belirtmiştir.Farklı bir öneri olarak katılımcılardan Ö6 küresel iklim değişikliği konularının biraz soyut olduğu, öğrencilerin konuları daha iyi anlayabilmeleri için somutlaştıracak materyallerle etkinliklere yer verilmesi gerektiğini şu cümlelerle ifade etmiştir.Ö6: “Öğretim programında bir model, materyal tasarlanarak somutlaştırılabilir. Bundan daha etkili ve gerçekçi bir yöntem ise küresel iklim değişikliği simülasyonu hazırlanabilir. Sanal uygulamalarla öğrenciler karbondioksit miktarını kendileri azaltıp artırarak sonuçların neler olduğunu gözlemleyebilir.”

Küresel İklim Değişikliğini Öğretmede Kullanılan Yöntemler Temasına Yönelik Bulgular

Bu bölümde fen bilimleri öğretmenlerine sorulan “Öğrencilere Küresel İklim Değişikliğini Öğretmede Kullandığınız Yöntemler Nelerdir?” sorusu ile toplanan veriler sunulmuştur (Tablo 4).

Tablo 4.

Öğrencilere Küresel İklim Değişikliğini Öğretmede Kullanılan Yönteme İlişkin Öğretmen Görüşleri

Kodlar	Frekans	Katılımcılar
Sunuş yolu	7	Ö1, Ö2, Ö3, Ö4, Ö5, Ö8, Ö10
Beyin fırtınası	4	Ö2, Ö5, Ö7, Ö9
Soru-cevap	3	Ö2, Ö4, Ö7
Tartışma	2	Ö5, Ö6

Tablo 4’e göre katılımcıların öğrencilere küresel iklim değişikliği konularını öğretmede genellikle sunuş yoluyla öğretim yöntemini kullandıkları görülmektedir. Bu katılımcılardan Ö2 düşüncesini “Daha çok sunuş yoluyla öğretim tekniği kullanıyorum. Daha sonra öğrencilere bu sorunun sonuçlarının farkına varabilmesi için buluş yoluyla öğretim tekniği uyguluyorum. Öğrencilere burada sorular yönelterek beyin fırtınası yaptırmaya çalışıyorum. Soru cevap tekniği kullanarak öğrencilerin sonuçlarının kendilerinin bulmasını istiyorum.” şeklinde ifade etmiştir. Neden bu yöntemleri tercih ettikleri sorusu sonda olarak sorulmuştur. Ö4 kodlu katılımcı bu konudaki düşüncesini şu şekilde ifade etmiştir:“Soru cevap yöntemiyle sorunlar üzerinde tartışıyoruz. Genellikle sözel olduğu için sunuş yöntemiyle ders anlatımına yer veriyorum.” Daha etkili bir öğretim için farklı ne tür öğretim yöntemleri kullanılabilir sorusu bir diğer sonda olarak sorulmuştur. Bu konuda Ö3 kodlu katılımcı düşüncesini şu şekilde belirtmiştir: “Konuya daha çok ilgi duyan öğrencilerle bir grup oluşturup küresel iklim değişikliği hakkında takım çalışması yapmak afişler el broşürleri tişörtler şapkalar hazırlayarak ve bunu bulunduğum bölgedeki insanlarla iş birliği içerisinde olarak onlara farkındalık oluşturmak isterdim. Ayrıca okul dışı geziler düzenleyerek küresel iklim değişikliğinin hissedildiği bölgelere barajlara göllere gezilerek düzenlemek ve akılda kalıcılığı artırmak isterdim.”

TARTIŞMA, SONUÇ VE ÖNERİLER

Küresel iklim değişikliği, insanlığın daha önce deneyimlemediği riskleri içeren, çözümünün yine insana bağlı olduğu sosyal bir sorundur. Doğal çevreye karşı duyulan endişeler ve hassasiyet, ulusal ve uluslararası düzeyde arttıkça, çevre bilincinin kazandırılmasında eğitimin en önemli çözüm yolu olduğu giderek yaygınlaşan bir görüş olmaya başlamıştır. Çünkü toplumlara ilgilendiren küresel çevre sorunlarının çözümünde kişilerin istenilen düzeyde yetiştirilmesi için eğitime önemli görevler yüklenebilir (Bozkurt ve Aydoğdu, 2004). Bu nedenle bu araştırmada, fen bilimleri öğretmenlerinin küresel iklim değişikliğine ilişkin görüşleri belirlenmeye çalışılmıştır.

Araştırmada, fen bilimleri öğretmenlerinin küresel iklim değişikliğinin tanımına ilişkin bulgular incelendiğinde; dünya sıcaklığının artması, hava olaylarındaki değişimler, geniş çaplı iklim değişikliği, iklim dengesinin bozulması gibi cevaplar alınmıştır. Araştırma bulgusunu destekler nitelikte Tüzer (2011), Öztürk (2002) ve Vural (2018) farklı eğitim paydaşları ile yaptıkları çalışmalarda küresel iklim değişikliğini dünya sıcaklığındaki artış ve buna bağlı olarak hava olaylarının değişimler olarak ifade etmişlerdir.

Araştırmada, küresel iklim değişikliğine fen bilimleri dersi öğretim programında yeterince yer verilme durumu kategorisi incelendiğinde katılımcılar küresel iklim değişikliği konularına yer verildiğini ancak bunun yeterli olmadığını belirtmişlerdir. Ayrıca fen bilimleri dersi müfredatında iklim değişikliği ile ilgili kazanımların yeterli olmadığı, her sınıf düzeyinde ve iklim değişikliği konularını içeren dersler disiplinlerarası olarak verilmesi gerektiği sonucuna ulaşılmıştır. Barak ve Gönençgil (2020) yapmış oldukları çalışmada İklim Değişikliği Eğitimi yaklaşımına uygun olarak iklim ve iklim değişikliği konularını içeren dersler disiplinlerarası olarak verilmeli, iklim ve iklim değişikliği ile ilgili hedef-kazanımlar öğrencilerde kavram yanılgılarına neden olmayacak biçimde düzenlenmeli sonucuna ulaşmışlardır. Fen bilimleri dersi öğretim programına yönelik öneriler kategorisine ilişkin bulgularda iklim değişikliği konularının fen bilimleri dersi içerisinde ekoloji konusu adı altında ve iklim değişikliğinin süreç ile ilişkisini öğretebilmek için öğrenciye yaparak-yaşayarak öğrenme faaliyetleri sunulmasına olanak sağlayacak etkinliklerin kazanımlar içerisinde verilmesi gerektiği sonucuna ulaşılmıştır. Ayrıca öğretmenler öğrencilere küresel iklim değişikliği konularını öğretmede genellikle sunuş yoluyla öğretim yöntemini kullandıkları görülmektedir.

Sonuç olarak küresel iklim değişikliği hakkında insanların küçük yaşlardan itibaren farkındalık ve bilgi düzeylerinin artırılmasında eğitim en önemli role sahiptir. Bireylerin çevre sorunları üzerine farkındalıkları atılacak olursa bu problemlere bir çözüm bulunabilir (Aksüt, Doğan ve Bahar, 2016). Bunun yanında bireylerin kaygı düzeylerini düşürmek geleceğe daha umutla bakmalarına sağlayacaktır. Önemli çevre problemlerinden birisi olan küresel iklim değişikliği üzerinde durulması, insanlara anlatılması, küçük yaşlardan itibaren bu konu hakkında bireylerin bilgilendirilmesi, eğitim müfredatlarında bu konuya ayrıntılı olarak yer verilmesi, farklı ortamlarda konuşulması ve hepsinden önemlisi halkın tüm kesimlerinde farkındalık yaratılması önemli bir konudur.

Çalışmadan elde edilen bulgulara göre: fen bilimleri öğretmenleri, güncel küresel iklim değişikliği olaylarını takip etme konusunda teşvik edilmesi; fen bilimleri öğretmenlerine çevre sorunları, küresel ısınma ve küresel iklim değişikliği konuları ile ilgili hizmetiçi eğitimler verilmesi; küresel iklim değişikliği öğrenme alanının kazanım sayısı artırılmalı; küresel iklim değişikliğine yönelik okullarda uygulamaya dönük etkinliklere ağırlık verilmesi önerilerinde bulunulmuştur.

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DEVELOPMENT OF MOTIVATION SCALE FOR SCIENCE EDUCATION FOR 60-72 MONTHS CHILDREN: A VALIDITY STUDY

60-72 AYLIK ÇOCUKLAR İÇİN BİLİM EĞİTİMİNE YÖNELİK MOTİVASYON ÖLÇEĞİNİN GELİŞTİRİLMESİ: GEÇERLİK ÇALIŞMASI

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Abstract

It is thought that motivation towards science education in the preschool period is a factor that positively affects children's attitudes towards science and their academic achievement in later educational processes. For this reason, it is necessary to determine their motivation toward science education in the preschool period and to organize educational environments according to the results. In line with these discourses, this study aimed to conduct a validity study of the scale developed to determine the motivation of 60-72-month-old children towards science education. The study group of the scale consists of 171 children determined by a simple random sampling method. In the study, to conduct validity studies of the scale, content validity, Exploratory Factor Analysis, Confirmatory Factor Analysis, item-total correlations, and lower and upper group mean differences were examined by taking the opinions of the relevant field experts. As a result of the study; Exploratory Factor Analysis revealed that the scale had a four-factor structure consisting of 12 items and Confirmatory Factor Analysis was used to test the appropriateness of the scale. The Cronbach alpha internal consistency coefficient of the developed scale was found to be 0.71. As a result of the analyses, it was determined that the motivation scale for science education developed for 60-72-month-old children was valid and reliable.

Keywords: science education, preschool preiod, motivation, scale development, validity

Özet

Okul öncesi dönemde fen eğitimine yönelik motivasyonun, çocukların fene yönelik tutumlarını ve sonraki eğitim süreçlerindeki akademik başarılarını olumlu yönde etkileyen bir faktör olduğu düşünülmektedir. Bu nedenle okul öncesi dönemde fen eğitimine yönelik motivasyonlarının belirlenmesi ve sonuçlara göre eğitim ortamlarının düzenlenmesi gerekmektedir. Bu söylemler doğrultusunda bu çalışmada 60-72 aylık çocukların fen eğitimine yönelik motivasyonlarını belirlemek amacıyla geliştirilen ölçeğin geçerlik çalışmasının yapılması amaçlanmıştır. Ölçeğin çalışma grubunu basit tesadüfi örnekleme yöntemi ile belirlenen 171 çocuk oluşturmaktadır. Çalışmada ölçeğin geçerlik çalışmalarını yapmak üzere ilgili alan uzmanlarının görüşleri alınarak kapsam geçerliği, Açıklayıcı Faktör Analizi, Doğrulayıcı Faktör Analizi ve madde-toplam korelasyonları, alt ve üst grup ortalama farkları incelenmiştir. Çalışma sonucunda; Açıklayıcı Faktör Analizi ölçeğin 12 maddeden oluşan dört faktörlü bir yapıya sahip olduğunu ortaya koymuş ve ölçeğin uygunluğunu test etmek için Doğrulayıcı Faktör Analizi kullanılmıştır. Yapılan analizler sonucunda 60-72 aylık çocuklar için geliştirilen fen eğitimine yönelik motivasyon ölçeğinin geçerli olduğu tespit edilmiştir.

Anahtar Kelimeler: bilim eğitimi, okul öncesi dönem, motivasyon, ölçek geliştirme, geçerlik

GİRİŞ

Motivasyon; bizi harekete geçiren, çalışmaya devam etmemizi sağlayan ve görevleri tamamlamamıza yardımcı olan etken şeklinde tanımlanmaktadır. Yani içsel güçler, kalıcı özellikler, ödüller, inançlar ve etkiler nedeniyle oluşmaktadır. Aynı zamanda da yüksek motivasyonun öğrenme ve başarı ile ilişkisi de bulunmaktadır (Schunk ve diğerleri, 2014 p.4). Günümüz eğitiminde ise özellikle bilim alanının daha önemli hale gelmesi ile birlikte küçük yaşlardan itibaren çocukların bilimi sevmeleri ve temel bilim becerilerine sahip olmaları beklenmektedir. Bunun için de öncelikle çocukların bilim motivasyonlarının olabildiğince yüksek tutulması gerekmektedir.

Erken eğitim ortamlarında küçük çocukların bilim motivasyonunu doğrudan ele alan araştırmalar seyrek olsa da küçük çocukların doğal olarak bilim hakkında bilgi edinmek için motive olduklarını ortaya koyan önemli sayıda gelişimsel araştırma vardır (Patrick & Mantzicopoulos, 2015). Leibham ve arkadaşlarının (2013) çalışmalarında okul öncesi dönemde bilim etkinliklerine erkek ve kız çocuklarının ilgi alanları ile benlik kavramı ve bilim başarısı arasındaki ilişkinin incelenmesi amaçlanmıştır. Araştırma sonucunda; erken bilim ilgisinin, olumlu benlik kavramlarını ve daha yüksek bilim başarısı puanlarını teşvik etmede kızlar için kritik bir destekleyici faktör olabileceği görülmektedir.

Yapılan araştırmalara göre davranışlarında yüksek düzeyde motive olmuş bireyler, aynı zamanda ne yapmaya motive olduklarına dair belirli inançlara da sahip olmaktadır. Hem faaliyet sürecinin hem de faaliyet sonucunun değerli, önemli, ilginç veya eğlenceli olduğuna ve aktivitede iyi olduklarına veya pratik yaparak beceri kazanacaklarına inanmaktadırlar (Schunk ve diğerleri, 2014 p.4). Baskın motivasyon teorileri ise tüm bu sonuçları destekler nitelikte sosyal-bilişsel açıdan motivasyon davranışlarını inceleyerek bu davranışların bireylerin algı ve tutumlarından etkilendiğini vurgulamışlardır (Graham & Weiner, 2012).

Çocukların motivasyonu kendi tutumlarından kaynaklandığı gibi çevreninde motivasyon üzerinde etkisi büyüktür. Bu konuda yapılan araştırmalar incelendiğinde; Chakraverty ve arkadaşları (2020) yaptıkları çalışmada aileler evde çok çeşitli bilimsel terimler kullanarak çocukları hem bilimde hem de başka alanlarda ilgi alanlarını sürdürdükleri ve bilim eğitime karşı tutumlarını teşvik ettiklerini tespit etmiştir. Yılmaz ve arkadaşları (2018) tarafından yapılan çalışmada, ebeveynlerin çocuklarının bilime karşı motivasyonları üzerinde bir etkisi olduğu tespit edilmiştir. Yılmaz (2017) ise çalışmasında, aile katımlı bilim etkinliklerinin çocukların bilime karşı tutumlarını pozitif yönde etkilediği tespit edilmiştir. Oppermann ve arkadaşları (2019) araştırmasında okul öncesi öğretmenlerinin öz-yeterlik inançları ile bilim etkinliklerinin sıklığı arasında ve çocukların bilim motivasyonları arasında pozitif yönde bir ilişki saptanmıştır. Ayrıca öğretmenlerin öz-yeterlik inançları ile bilim etkinlik uygulamalarında erkeklere göre kızların motivasyonu arasında daha güçlü bir ilişki görülmüştür. Yapılan araştırmalar da göstermektedir ki okul ve aile ortamı motivasyon için büyük önem taşımaktadır.

Motivasyon ile ilgili yurtdışı ve yurtiçi çalışmalar incelendiğinde ise, bu konuda çok az çalışma olduğu ve genel olarak nitel çalışmalara yer verildiği gözlenmektedir. Patrick ve arkadaşları (2008) tarafından yapılan araştırmada, bilime erken dönemde anlamlı bir şekilde katılmanın, kızların ve erkeklerin bilim için motivasyonunu destekleyebileceğini göstermektedir. Patrick ve arkadaşları (2008) araştırma makalesinde, düşük yeterlik ve yüksek ilgi profiline sahip çocuklar, motivasyonel inançları yüksek olan çocuklardan daha az öğrenmeye destek verdiğini bildirmiştir. Ayrıca gözlemlenen öğretmen-çocuk etkileşimlerinin doğası ve sıklığının

motivasyon profiline göre farklılık gösterdiği de tespit edilmiştir. Dilek ve arkadaşları (2020) çalışmalarında, araştırmaya dayalı STEM etkinliklerinin ardından çocuklar bilimi bir etkinlik alanı olarak kabul ederek bilime yönelik motivasyonlarında olumlu değişiklikler olduğu gözlenmiştir.

Bilim eğitiminde motivasyon konusunda çok az araştırma olmasına rağmen çocukların motivasyonunun öğrenmeleri kadar önemli olduğu düşüncesi savunulmaktadır. Örneğin, ABD'de bilim kariyerlerini seçme konusunda yeterli yeteneğe sahip çok az kişinin mevcut durumu, temelde bir motivasyon sorununu yansıtmaktadır. Bu nedenle, küçük çocukların bilim eğitiminin motivasyonel sonuçları hakkında daha fazla nicel araştırmaya, deneysel araştırmaya ve yeni müfredatın öğrenmenin yanı sıra çocukların motivasyonuna da fayda sağladığına dair kanıtlara ihtiyaç duyulduğu görülmektedir. Açıkça, bilim motivasyonunu ölçmek için kullanılan araçlarda devam eden gelişmelere ihtiyaç vardır. Bu ölçme araçları; bilim içindeki farklı konular veya alanlar arasında ayırım yapmayı, iç tutarlılık güvenilirliğine sahip olmayı, uygun yaş aralığı düzeyine göre ölçme sağlamayı, çocukların yanıtladıkları sorularla ne demek istediğini anlamayı ve çocukların bilimi öğrendikleri bağlamlar hakkında daha fazla bilgi sahibi olmayı içermelidir (Patrick & Mantzicopoulos, 2015 p.20-27). Bu kapsamda geliştirilmesi hedeflenen geçerli ve güvenilir bir motivasyon ölçeğinin okul öncesi dönemde bilim eğitimi alanı için bir boşluğu doldurması hususunda önemli olduğu düşünülmektedir. Alan yazında çocukların bilim eğitimine yönelik motivasyonlarını ölçmek amacıyla tasarlanan bir test veya ölçeğe rastlanmadığı gözlenmiştir. Bu nedenle yapılan çalışmanın amacı, 60-72 aylık çocukların bilim eğitimine yönelik motivasyonlarının belirlenmesi amacıyla ölçek geliştirilmesi ve bu ölçeğin geçerlik sonuçlarını ortaya koymaktır.

YÖNTEM

Çalışma Grubu

Araştırmanın çalışma grubu, Uşak İlinde Millî Eğitim Bakanlığına bağlı anaokulları ve ilköğretime bağlı anasınıflarında eğitim-öğretime devam eden farklı sosyo-ekonomik düzeylere sahip 60-72 ay grubundaki çocuklardan oluşmaktadır. Anaokulu ve ilköğretime bağlı anasınıflarına devam eden, çalışmaya gönüllü olarak katılmak isteyen ailelerin çocukları basit tesadüfî örneklem yöntemi ile belirlenerek toplamda 171 çocuk ile araştırma yürütülmüştür. Tavşancıl (2006) ölçek geliştirme çalışmalarında çalışma grubunun belirlenmesinde ölçek maddesinin en az beş katı kadar veriye ulaşılması gerektiğini ifade etmiştir. Yapılan araştırmanın çalışma grubunun belirlenmesinde de bu durum göz önünde bulundurularak ölçekte yer alan madde sayısının (32 madde) en az beş katı çocuk ile çalışma yürütülmüştür.

Veri Toplama Aracı

60-72 aylık çocuklar için bilim eğitimine yönelik motivasyon ölçeğinin geliştirilmesi sürecinde öncelikle alan yazın incelendiğinde yurt içinde 60-72 aylık çocuklar için bilim eğitimine yönelik motivasyon ölçeği olmadığı gözlenmiştir. Yurt dışında yapılan araştırmalar incelendiğinde ise, araştırmacı tarafından 60-72 aylık çocuklar için bilim eğitimine yönelik motivasyonu ölçmek amacıyla sadece bir ölçek olduğu görülmüştür. Tasarlanmış bu ölçek çocukların özgüven ve beğenilerine odaklanılan sorular ile oluşturularak her soru için de ilgili resim gösterilerek uygulanmıştır (Oppermann ve diğerleri, 2017).

Alan yazın taraması esnasında çocukların özellikle de 60-72 aylık çocuklarının bilim eğitimlerine yönelik motivasyonlarını ölçen bir ölçeğe rastlanmamıştır. 60-72 aylık çocuklar

için bilim eğitime yönelik motivasyonlarını belirlemek için geliştirilmesi hedeflenen ölçek çalışması için araştırmacı aşağıda yer alan süreçleri izlemiştir.

60-72 aylık çocuklar için bilim eğitime yönelik motivasyon ölçeği geliştirilmesinde ilk önce 60-72 ay çocukları için tutum boyutunda 31 algı boyutunda 16 olmak üzere toplamda 47 maddelik motivasyona ilişkin madde havuzu hazırlanmıştır. Hazırlanan madde havuzu için alan yazından incelemelerinden ve ABD ulusal bilim standart alanlarından ve okul öncesi eğitim alanında bilim eğitimi üzerine çalışmakta olan uzmanlardan alınan görüşlerden yararlanarak gerekli düzenlemeler yapılmıştır. Düzenlenen maddeler okul öncesi eğitimde bilim eğitimi alanında çalışmakta olan uzmanlara ulaştırılarak incelemeleri sağlanmış ve tutum boyutu maddelerinin okul öncesi dönem bilim eğitimi konuları arasında yer alan yaşam bilimleri, yeryüzü ve uzay bilimleri, fiziksel bilimler, mühendislik alanlarına göre gruplandırılmıştır. Gruplandırılan maddeler çocukların yaş özelliklerine ve dikkat süreleri dikkate alınarak okul öncesi eğitimde bilim eğitimi alanında çalışmakta olan alan uzmanları tarafından tekrar incelenmiştir. Motivasyona ilişkin maddelerin bazılarının soyut kalması nedeniyle somutlaştırılarak düzenlenmesi, bazılarının ise, çocukların yaş ve gelişimlerine uygun olmadığı gerekçesi ile havuzundan çıkarılmasına karar verilmiştir. Yapılan çalışmalar doğrultusunda tutum boyutu maddeleri 21 algı boyutu maddeleri ise 11 olmak üzere toplamda 32 maddeye indirilmiştir. Ölçeğin değerlendirilmesinde alan yazındaki ölçek maddelerinin değerlendirme ölçütleri de dikkate alınarak (Shure, 1992; Webster-Stratton, 1990) likert tipi puanlamanın yapılmasına karar verilmiştir. Değerlendirmede çocuk için hazırlanan 4 cevap bulunmaktadır. Bunlar “evet”, “bazen”, “hayır” ve “bilmiyorum” şeklindedir. Çocukların bu cevapları kolay bir şekilde verebilmesi için ise, cevaplarda yüz ifadeleri kullanılmaktadır. Ölçekte yer alan maddelerin tümünden elde edilen puanlar toplandığında Bilim Eğitime Yönelik Motivasyon puanı elde edilmiştir.

İşlem

60-72 Aylık Çocuklar İçin Bilim Eğitime Yönelik Motivasyon Ölçeğinin geliştirilmesine ilişkin bu çalışmada geçerlik çalışmaları için kapsam ve yapı geçerliğine bakılmıştır. Öncelikle çalışmanın kapsam geçerliğini sağlamak için alan yazın taraması yapılarak ilgili yayınlar incelenmiş ve ölçme aracında yer alan maddeler uzmanlar eşliğinde oluşturularak, görüş alınması için farklı beş uzmana gönderilmiştir. Sonrasında ise, toplanan veriler ile ölçeğin Kaiser-Meyer-Olkin (KMO) katsayısı ve Bartlett küresellik testine bakılarak faktör analizine uygunluğu tespit edilmiştir. Geçerlik çalışmaları için Açıklayıcı Faktör Analizi (AFA) ve Doğrulayıcı Faktör Analizi (DFA), madde toplam korelasyonları, alt üst grup ortalamalar farkı hesaplanmıştır.

BULGULAR VE TARTIŞMA

Geçerlik Çalışması

60-72 Aylık Çocuklar İçin Bilim Eğitime Yönelik Motivasyon Ölçeği'nin kapsam geçerliliğini test etmek amacıyla hazırlanan 47 madde okul öncesi eğitim alanında bilim eğitimi üzerine çalışan beş uzman kişiden görüş alınarak değerlendirmeleri istenmiştir. Alan uzmanlarından ölçeğe ilişkin maddelerin amaca uygun ve anlaşılır olması açısından “uygun”, “uygun değil” olmak üzere iki derecelendirme üzerinden değerlendirmeleri ve gerekli gördükleri maddelere ilişkin yorum yapmaları istenmiştir. Beş alan uzmanı 27 madde için %90 ve üzeri oranında uyuşma göstermiştir. Fakat 5 madde için ise %80-90 oranında uyuşma göstermiştir. Alınan görüşler doğrultusundan kapsam geçerliğini sağlamak adına öneriler doğrultusunda tekrar düzeltmeler yapılmıştır. Kapsam geçerliği sonucunda 32 maddede içeren

60-72 Aylık Çocuklar İçin Bilim Eğitime Yönelik Motivasyon Ölçeği ön uygulama yapmak için hazır hale gelmiştir. Ölçek ilgili çalışma grubuna uygulanmadan önce 30 çocuğa ön uygulama olarak yapılarak gerekli düzenlemeler olup olmadığı tespit edilmiştir. Uygulama sonrası herhangi bir düzenlemeye ihtiyaç duyulmamıştır. Veri toplama sürecine hazır hale getirilen 60-72 Aylık Çocuklar İçin Bilim Eğitime Yönelik Motivasyon Ölçeği 171 çocuğa boş ve sessiz bir sınıf ortamında çocuklara uygun masa ve sandalyelerde tek tek araştırmacı tarafından uygulanarak gerekli veriler toplanmıştır. Ölçeğin her bir çocuğa uygulama süresi ise, ortalama 15-20 dakika sürmüştür.

60-72 Aylık Çocuklar İçin Bilim Eğitime Yönelik Motivasyon Ölçeği'nin yapı geçerliğini belirlemek için öncelikle Kaiser Meyer-Olkin (KMO) katsayısı ve Bartlett Küresellik Testi ile verilerin faktör analizine uygunluğunu tespit edilmiştir. Analiz sonucunda ise, KMO= 0.66 ve Bartlett Küresellik Testi= 488,538, $p<0.001$ sonuçları ölçeğin faktör analizine uygun olduğunu göstermektedir. Bu sonuç doğrultusunda ölçeğin en az dört alt faktöre sahip olduğu ve ölçekte bulunan maddeler arasında belirli bir yapıyı yansıtabilecek korelasyon olduğu yorumu yapılmaktadır. KMO testi sonucu elde edilen katsayının 0.50'den büyük olması ve $p<0.001$ olması neticesinde de verilerin AFA için iyi düzeyde ve analize devam edilebilir olduğunu göstermektedir (Özdamar, 2017, s.148).

Ölçeğin yapısal geçerliliğini analiz etmek için ise AFA ve DFA'dan yararlanılmıştır. Öncelikle ölçekte bulunan maddelerin faktörel olarak ayrışmasını incelemek için AFA yapılmıştır. AFA sonucu, ölçeğin 4 alt faktörden oluştuğu görülmüştür. Alt faktörler, ölçeğin toplam varyansın %62'sini açıklamaktadır. Açıklanan varyans oranı açısından, faktörleri en büyük açıklama oranından, en küçük açıklama oranına doğru sıralandığında, %16,19 ile "Bilimsel Olaylara Merak Boyutu (BOMB)" faktörü en yüksek açıklama oranına sahip, ikinci faktör %15,79 ile "Zaman Geçirme Boyutu (ZGB)", üçüncü faktör %15.66 ile "Bilime Karşı Algı Boyutu (BKAB)" ve açıklanma oranı en düşük olan faktör ise %14.44 ile "Kalıplaşmış Yargı Boyutu (KYB)" faktörüdür.

Ölçekte bulunan 32 maddenin 20 tanesinin faktör yükleri 0,50'nin altında ve diğer maddeler ile etkileşimi olduğu için ölçekten çıkarılmıştır. Ölçek, 4 faktörden oluşmaktadır. Her faktörü temsil eden 3 madde bulunmaktadır. Ölçeğe ait AFA sonuçları aşağıdaki Tablo 1'de yer almıştır.

Tablo 1. 60-72 Aylık Çocuklar İçin Bilim Eğitime Yönelik Motivasyon Ölçeği Faktör Yükleri

Alt Faktörler	1.Faktör	2.Faktör	3.Faktör	4. Faktör
Madde 18: Bir televizyondan çıkan sesin bütün odada nasıl duyulduğunu merak ederim.	.812			
Madde 17: Bir kaloriferin bütün odayı nasıl ısıtabildiğini merak ederim.	.813			
Madde 11: Televizyonda uzay ile ilgili programlar ilgimi çeker.	.638			
Madde 6: Doğada incelemeler yapmak isterim		.825		
Madde 2: Deney yapmak isterim		.774		
Madde 10: Gezegenleri ya da yıldızları incelemek isterim.		.585		
Madde 25: Bilim için çok fazla çalışmamız gerekir.			.858	
Madde 32: Bilim için çok araştırma yapmak gerekir.			.828	
Madde 24: Bilim beni düşündürür.			.517	
Madde 27: Bilim çok zordur.				.771
Madde 31: Bilim insanları için özel kıyafetler vardır.				.750
Madde 30: Bilim çalışmalarını sadece laboratuvarlarda yapılmalıdır.				.698
Total	1.943	1.896	1.879	1.733
% of Variance	16.191	15.798	15.656	14.444
Cumulative %	16.191	31.988	47.644	62.087
KMO			.659	
Bartlett's Test of Sphericity (Sig.)			0.00001	

Not: Faktör Yükleri 0.400 üzerinde olanlar tabloda yazılmıştır.

Çalışma grubundan elde edilen veriler ile gerçekleştirilen uygulama sonucunda yapılan AFA sonuçları Tablo1'de gösterilmiştir. AFA sonuçlarında ölçek 4 alt faktörden oluşmaktadır. Ölçeğin "Bilimsel Olaylara Merak Boyutu (BOMB)" alt faktörü ile ilgili 3 madde yer almakta ve maddelerin faktör yük değerleri .638 ile .813 arasında değişmekte, ayrıca toplam varyansın %16,19'nu açıklamaktadır. İkinci faktör ise, "Zaman Geçirme Boyutu (ZGB)" olup bu alt faktör 3 maddeden oluşmaktadır. Faktör yük değerleri ise .585 ile .825 arasında değişmekte, ayrıca toplam varyansın %15,79'nu açıklamaktadır. Üçüncü faktör ise, "Bilime Karşı Algı Boyutu (BKAB)" olup bu alt faktör de 3 maddeden oluşmaktadır. Faktör yük değerleri ise .517 ile .858 arasında değişmekte ve açıklanan toplam varyansın %15,66'sını açıklamaktadır. Dördüncü faktör ise, "Kalıplaşmış Yargı Boyutu (KYB)" olup bu faktör 3 maddeden oluşmaktadır. Bu faktöre ait maddelerin faktör yük değerleri ise .698 ile .771 arasında değişmektedir, ayrıca toplam varyansın %14,44'nü açıklamaktadır. Buna göre dört faktör, toplam varyansın %62'sini açıklamaktadır.

Ölçeğe ilişkin dört boyut incelenerek boyutlarda toplanan maddeler tekrar okul öncesi eğitim alanında bilim eğitimi üzerine çalışmakta olan alan uzmanlarına gönderilerek ölçeğin bu hali için görüşlerini iletmeleri istenmiştir. Uzmanlar tarafından verilen görüşler ile birlikte birinci

boyutta toplanan maddelerin içeriği bilim olaylara merak ile ilgili olduğundan “Bilimsel Olaylara Merak Boyutu (BOMB)”, ikinci boyutta toplanan maddelerin içeriği bilimsel aktivitelerle zaman geçirmek ile ilgili olduğundan “Zaman Geçirme Boyutu (ZGB)” boyutu, üçüncü boyutta toplam maddelerin içeriği bilime karşı algı ile ilgili olduğu için “Bilime Karşı Algı Boyutu (BKAB)” ve dördüncü boyutta toplam maddelerin içeriği bilime karşı kalıplaşmış yargularla ilgili olduğu için “Kalıplaşmış Yargı Boyutu (KYB)” olarak isimlendirilmiştir. Açımlayıcı Faktör Analizi analizi sonuçları doğrultusunda “BOMB” adlı faktör üç madde içermekte, maddelerin yük değeri .638 ile .813 arasında değişmekte, “KGB” adlı faktör dört madde içermekte, maddelerin yük değeri .585 ile .825 arasında değişmekte, “GEMB” adlı faktör dört madde içermekte, maddelerin yük değeri .517 ile .858 arasında değişmekte ve “DUEMB” adlı faktör beş madde içermekte, maddelerin yük değeri .698 ile .771 arasında değişmektedir. Scherer (1988)’e göre “maddelerin yük değerleri ile ilgili bulunan veriler, istatistiksel olarak anlamlı olup, maddelerin ayırt edicilik bakımından iyi olduğu söylenebilir” (Aktaran Ünal & Aral, 2014).

60-72 Aylık Çocuklar İçin Bilim Eğitime Yönelik Motivasyon Ölçeği’nin Açımlayıcı Faktör Analizi (AFA) sonucunda elde edilen modeli, Doğrulayıcı Faktör Analizi (DFA) yapılarak model veri uyumu sınanmıştır.

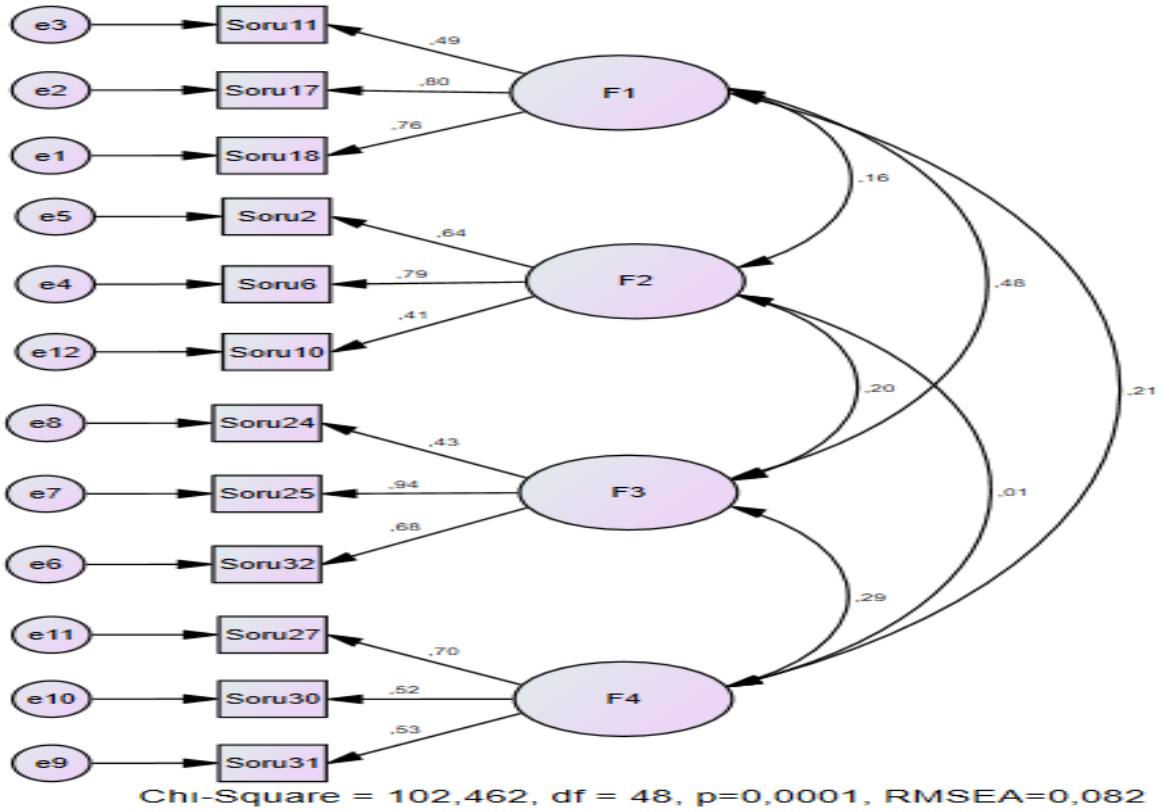
Yeni bir ölçek geliştirme sürecinde büyük bir örnekleme ulaşmak mümkün ise verinin yarısına Açımlayıcı Faktör Analizi (AFA) ve diğer yarısına Doğrulayıcı Faktör Analizi (DFA) yapmak sık önerilen ve uygulanan yol olsa da (Henson & Roberts, 2006) bu araştırmada aynı veriye hem AFA hem de DFA uygulanmıştır. Worthington ve Whitaker (2006), aynı örneklem üzerinde hem AFA hem de DFA yapılmasının problem oluşturmayacağını ifade etmektedir.

60-72 Aylık Çocuklar İçin Bilim Eğitime Yönelik Motivasyon Ölçeğine AFA uygulanıp alt faktörler belirlenmiştir. AFA ile belirlenen faktörlerin doğruluğunu test etmek amacıyla DFA yapılmıştır. DFA için AMOS 24 paket programı kullanılmıştır. DFA yapılmadan önce verilerin çok değişkenli normal dağılıma uygun olup olmadığı test edilmiştir. Çok değişkenli normal dağılım sonuçları Tablo 2’de gösterilmiştir.

Tablo 2. Çok Değişkenli Normallik Değerleri

	Kurtosis	Z değeri
AMOS	81,991	29,246

Çok değişkenli normal dağılıma uygunluk testi sonucu p değeri 0,0001 ve z değeri 29,246 olarak bulunmuştur. Elde edilen değerler sonucu verilerin çok değişkenli normal dağılmadığı sonucuna varılmıştır. 60-72 Aylık Çocuklar İçin Bilim Eğitime Yönelik Motivasyon Ölçeğinin çok değişkenli normal dağılıma uygunluk testi sonuçları incelendikten sonra ölçeğe birincil düzey DFA uygulanmıştır. DFA analizi sonucunda elde edilen yol diyagramı ve analiz sonuçları Şekil 1’de verilmektedir. Ayrıca ölçeğe ait DFA sonucu uyum indeks değerleri ise Tablo 3’de verilmektedir.



Şekil 1. 60-72 Aylık Çocuklar İçin Bilim Eğitimine Yönelik Motivasyon Ölçeği'nin Dört Faktörlü Yol Diyagramı

Tablo 3. Ölçeğe ait DFA sonucu uyum indeks değerleri

İndeks	İyi Uyum	Kabul edilebilir Uyum	Sonuçlar
NFI	$0,95 \leq NFI \leq 1,00$	$0,90 \leq NFI \leq 0,95$	0,796
CFI	$0,97 \leq CFI \leq 1,00$	$0,95 \leq CFI \leq 0,97$	0,875
GFI	$0,90 \leq GFI \leq 0,95$	$0,95 \leq GFI \leq 1,00$	0,916
SRMR	$0,00 \leq SRMR \leq 0,05$	$0,05 \leq SRMR \leq 0,10$	0,084
RMSEA	$0,00 \leq RMSEA \leq 0,05$	$0,05 \leq RMSEA \leq 0,10$	0,082
χ^2/sd	$0 \leq \chi^2/sd \leq 2$	$2 \leq \chi^2/sd \leq 3$	2,135

Şekildeki yol diyagramı ve Tablo 3 incelendiğinde, 4 faktörden oluşan ölçeğin kabul edilebilir uyuma sahip olduğu görülmektedir. Her bir faktörü temsil eden maddelerin faktör yükleri incelendiğinde, F1: Bilimsel Olaylara Merak Boyutu (BOMB) faktörü için 0,49-0,80; F2: Zaman Geçirme Boyutu (ZGB) faktörü için 0,41-0,79; F3: Bilime Karşı Algı Boyutu (BKAB) faktörü için 0,43-0,94 ve F4: Kalıplaşmış Yargı Boyutu (KYB) faktörü için 0,52-0,70 aralığında değişmektedir.

DFA'de hesaplanan model uyum değerleri ise, Normed Fit İndex (NFI) değeri 0,796 Comparative fit index (CFI) değeri 0,875, Goodness-of-Fit Index (GFI) değeri 0,916 Standardized Root Mean Square Residual (SRMR) değeri 0,084, Root Mean Square Error of Approximation (RMSEA) değeri 0,082 ve ki kare/serbestlik derecesi değeri 2,135 olarak bulunmuştur. Bu değerler açısından incelendiğinde modelin kabul edilebilir uyum gösterdiği sonucuna varılmıştır.

SONUÇ VE ÖNERİLER

Bu araştırmada “60-72 Aylık Çocuklar İçin Bilim Eğitime Yönelik Motivasyon Ölçeği”nin geliştirilmesi ve bu ölçeğin geçerlik çalışmasının yapılması amaçlanmıştır. Alan yazın taraması esnasında 60-72 aylık çocuklarının bilim eğitime yönelik motivasyonlarını ölçen bir ölçek ya da test olmadığı gözlenmiştir. Geliştirilen “60-72 Aylık Çocuklar İçin Bilim Eğitime Yönelik Motivasyon Ölçeği” ile çocukların bilim eğitime yönelik motivasyon düzeylerinin belirlenmesi ve çocukların bilim eğitime yönelik motivasyonlarını arttırmak için uygun eğitim programları ve olanaklarının hazırlanması amacıyla alan yazına fayda sağlayacağı düşünülmektedir.

“60-72 Aylık Çocuklar İçin Bilim Eğitime Yönelik Motivasyon Ölçeği” nin geliştirilme sürecinde öncelikle 32 maddelik taslak bir ölçek hazırlanmıştır. Sonrasında ise hazırlanan bu ölçeğe son şeklini vermek ve geçerlik analizlerini yapmak adına 171 çocuktan oluşan çalışma grubuna tek tek ölçek uygulanmıştır. Ölçeğin geçerlik çalışmalarından elde edilen bulgular ise, ölçeğin 60-72 aylık çocukların bilim eğitime yönelik motivasyonlarını ölçmede kullanılabilecek geçerli bir ölçme aracı olduğunu göstermiştir. Geliştirilen ölçekte 4 boyut ve toplam 12 madde yer almaktadır.

Çalışmada yapılan analizler ile birlikte ölçek son şeklini almıştır. Geliştirilen bu ölçeğin 60-72 aylık çocukların bilim eğitime yönelik motivasyonlarını saptamak için 60-72 aylık çocuklara uygulanabileceği görülmüştür. Ölçeğin geliştirilmesinde sadece 60-72 aylık çocuklardan veriler toplanmıştır. Yapılacak diğer çalışmalarda farklı örneklem grupları belirlenerek çalışma genişletilebilir.

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**STUDY OF ISOMORPHISM OF TOLERANCE CLASSES ON DIFFERENT
LEVELS OF HIERARCHICAL CONTROL SYSTEMS**

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ABSTRACT

Based on set-theoretic analysis of multi-level hierarchical automated process control systems, tolerance classes are identified at their various levels according to the functional characteristics associated with the purpose of technological objects. It has been established that these tolerance classes have characteristics of Abelian additive groups, for which it is proposed to use groups based on a piecewise specified binary operation over the indices of their elements. Using Kelly's theorem in group theory, it is proven that these tolerance classes are isomorphic with respect to each other at different levels of systems. This allows us to develop unified approaches to the synthesis, design, maintenance and repair of various levels of hierarchical systems and means of their research.

In the analysis and synthesis of multi-level hierarchical of automated technological process control systems (ACS TP) with programmed operation logic, there is a need for coordination between levels. The trivial approaches used for this purpose are based on the correspondence between control objects and system control, its software and hardware modules at all levels. However, in many cases, such correspondence is not unambiguous, which leads to a violation Adequacy of receiving and transmitting command and control information. This order of things is not acceptable for ACS TP in responsible areas, therefore it is indicated for them compliance must be clearly established and proven [1, 2].

The purpose of the work is to develop an approach to the formation of unified theoretical group models of multi-level ACS TP from the point of view of allocation to its levels of mutually unambiguous tolerance classes, which will allow us to identify common principles of their design, research and further exploitation.

To achieve this goal, the following tasks were set and solved:

- formation of an expression for a piecewise given group that can combine elements and ACS TP modules of common purpose;

- establishing the principles of grouping elements of all levels of ACS TP by functional feature using a piecemeal set group;
- determination of the conditions of isomorphism between functional groups of different levels of ACS TP, development of methods for proving the specified isomorphism.

INTRODUCTION

Let some ACS TP is built according to the client-server architecture and contains n hierarchical levels involved in the management and control of a set A of technological objects. Each control and control object (OCK) $a_j \in A$ directly interacts with one microprocessor object controller (MPC) $ll_j \in LL$, which is a low-level element. In turn, the logical dependencies of the operation of the ACS TP are implemented by the software (software) of the middle level of the system (middle level), and the management and control of each IPC is carried out by the $ml_j \in ML$ software module, and directly the logical dependencies are performed by the dynamic interaction of ml_j elements:

$$\forall (a_j \in A) \leftrightarrow \exists (ll_j \in LL) \leftrightarrow \exists (ml_j \in ML).$$

According to the works [3, 4], the set of OKC A in the ACS TP can be divided into n tolerance classes according to the type of used IPC of the lower level (according to the functional

sign):

$$A = \bigcup_{i=1}^n A_i^{LL}, \bigcap_{i=1}^n A_i^{LL} = \emptyset, \tau_i^{LL} \subset A \times A : \forall A_i^{LL} \rightarrow \exists ! LL_i \subset LL,$$

where is the corresponding tolerance class on set A ; – the tolerance ratio by the type of IPC used; LL_i is a set of IPCs of a certain type, to which OKCs are connected.

If, within each tolerance class, a continuous numbering of elements () is performed according to formula (2) and a binary operation "*" corresponding to expression (3) is set on it,

$$\forall (a_b, a_c) \in A_i^{LL} \rightarrow \exists a_d \in A_i^{LL} : a_b * a_c = a_d;$$

$$\forall (a_b, a_c, a_d) \in A_i^{LL} : a_b * (a_c * a_d) = (a_b * a_c) * a_d = a_d = a_b * a_c * a_d;$$

$$\exists a_e \in A_i^{LL} \rightarrow \forall a_g \in A_i^{LL} : a_g * a_e = a_e * a_g = a_g;$$

$$\forall a_g \in A_i^{LL} \rightarrow \forall a_g^{-1} \in A_i^{LL} : a_g * a_g^{-1} = a_g^{-1} * a_g = a_e;$$

$$b, c, d, e = \overline{1}, r = [A_i^{LL}]$$

then, according to the theory of groups [3], each class is a group of order : . For a binary operation, in which conditions (3) are fulfilled, we can take a piecewise procedure over element indices , which consists in finding the absolute value of the sequential summation of these indices and subtracting from them the largest index or the nearest larger integer from its half value, depending on the results sums of the indices themselves:

$$d = \begin{cases} \left\lfloor b + c - \left\lfloor \frac{r}{2} \right\rfloor \right\rfloor, \text{ якщо } \left\lfloor \frac{r}{2} \right\rfloor \neq b + c \leq \left\lfloor \frac{3r}{2} \right\rfloor; \\ \left\lfloor b + c - \left\lfloor \frac{r-2}{2} \right\rfloor \right\rfloor \equiv 1, \text{ якщо } b + c = \left\lfloor \frac{r}{2} \right\rfloor; \\ |b + c - r|, \text{ якщо } b + c > \left\lfloor \frac{3r}{2} \right\rfloor. \end{cases}$$

At the same time, the neutral element of each group is found by transforming the expression (3) - from the equations and , from which the value follows. In turn, the inverse element , according to formula (4), is found from the equations and , from which it follows:

The average expression in formula (3), which excludes the zero index and equates it to one (because, according to (4),), is identically equal to one, so it is not taken into account.

Since , the index is meaningless for all values of (), so the only value of the inverted element is , to which the only neutral element will correspond. Given that the equality holds, according to expression (4), the element will be neutral for all group members. Substitution of elements and in the lower two expressions of formula (3) by operation (3) confirms their truth.

At the same time, the truth of the first expression of formula (3), which reflects closedness of the binary operation (4) with respect to the elements of the group, follows from the properties of the absolute values and ranges of values of the expression $b + c$ [5, 6]:

$$b, c \in [1; r] \rightarrow b + c \in [2; 2r] \rightarrow b + c = \begin{cases} d + \left\lfloor \frac{r}{2} \right\rfloor, \text{ якщо } b + c \in \left[2; \left\lfloor \frac{r}{2} \right\rfloor \right) \cup \left(\left\lfloor \frac{r}{2} \right\rfloor; \left\lfloor \frac{3r}{2} \right\rfloor \right]; \\ d + \left\lfloor \frac{r-2}{2} \right\rfloor = 1 + \left\lfloor \frac{r-2}{2} \right\rfloor, \text{ якщо } b + c = \left\lfloor \frac{r}{2} \right\rfloor; \\ d + r, \text{ якщо } b + c \in \left[\left\lfloor \frac{3r}{2} \right\rfloor; 2r \right], \end{cases}$$

where are the corresponding areas of values D1, D2, D3 of the index d:

$$2 + \left\lfloor \frac{r}{2} \right\rfloor \leq d + \left\lfloor \frac{r}{2} \right\rfloor \leq \left\lfloor \frac{3r}{2} \right\rfloor \rightarrow D_1 = [2; r], D_2 = 1, \left\lfloor \frac{3r}{2} \right\rfloor < d + r \leq 2r \rightarrow D_3 = \left[\left\lfloor \frac{r}{2} \right\rfloor; r \right].$$

The full range of values D of the index d is found as a combination of its local ranges of values D1, D2, D3 [7, 8]:

$$D = D_1 \cup D_2 \cup D_3 = [2; r] \cup 1 \cup \left[\left\lfloor \frac{r}{2} \right\rfloor; r \right] = [1; r],$$

which corresponds to the expression in formula (2), and therefore confirms the closure of operation (3) with respect to the elements of the group.

The truth of the second expression from the top in formula (3) for the binary operation "" directly follows from the associativity of the operation of the arithmetic sum of real numbers, which is the basis of the specified binary operation (4), which determines the additive nature of each group.

From the commutativity of the arithmetic sum of real numbers, it follows that each class of tolerance according to the functional characteristic of the IPC is an Abelian group of the corresponding elements (field control and control devices) [4].

Proceeding from researches [9, 10], there is a bijection between the sets A, LL and program modules of the OKC in the composition of the middle-level software of the ACS TP, from which mutually unambiguous classes of tolerance according to the functional feature on these sets follow:

$$(A \leftrightarrow LL \leftrightarrow ML_A) \rightarrow \left(\bigcup_{i=1}^n A_i^{LL} \leftrightarrow \bigcup_{i=1}^n LL_i^A \leftrightarrow \bigcup_{i=1}^n ML_{Ai}^{LL} \right), \bigcap_{i=1}^n LL_i^A = \emptyset, \bigcap_{i=1}^n ML_{Ai}^{LL} = \emptyset;$$

$$\tau_i^{A,LL} \subset A \times A: \forall A_i^{LL} \leftrightarrow \exists! LL_i^A \subset LL, \tau_i^{LL,A} \subset LL \times LL: \forall LL_i^A \leftrightarrow \exists! A_i^A \subset A;$$

$$\tau_i^{LL,ML} \subset LL \times LL: \forall LL_i^A \leftrightarrow \exists! ML_{Ai}^{LL} \subset ML, \tau_i^{ML,LL} \subset ML \times ML: \forall ML_{Ai}^{LL} \leftrightarrow \exists! LL_i^A \subset LL,$$

where = , are the corresponding tolerance classes on the sets LL and ML; , – respectively, the tolerance ratio according to the types of IPCs used and the OKCs connected to them: = ()-1; , – respectively, the tolerance ratio by types of used software modules and IPC interacting with them: = ()-1.

According to the superposition property of the bijective relation, which is given by the upper expression in formula (5), the tolerance classes on the sets A and ML are also mutually unambiguous, from which we can distinguish mutually inverse tolerance relations on the set A by the type of OCC and on the set ML by the type of their program modules :

$$\tau_i^{A,ML} \subset A \times A: \forall (A_i^{ML} = A_i^{LL}) \leftrightarrow \exists! (ML_{Ai}^A = ML_{Ai}^{LL}) \subset ML;$$

$$\tau_i^{ML,A} \subset ML \times ML: \forall ML_{Ai}^A \leftrightarrow \exists! A_i^{ML} \subset A$$

Then, according to the properties of symmetry of the bijective relation [3], there must be equivalence of tolerance classes in formulas (5), (6): from which the isomorphism of the permutations of the elements on the given sets follows:

It is known from group theory that the set of permutations of a finite set of r elements is a finite group of order r! relative to the permutation multiplication operation. In each such group Sr! it is possible to single out a subgroup (where Pe is an identical permutation) of order [Sr] = r, which, according to Cayley's theorem and the transitivity of isomorphism, will be isomorphic to the group : [4].

If at the same time within each class in the expressions (5), (6) we perform a mutually unambiguous indexing (numbering) of the elements corresponding to each other: , and also specify the binary operation (4), then, according to Cayley's theorem, the sets and will also be Abelian groups with respect to the operation "*", isomorphic, respectively, to the groups = . From the transitivity and symmetry of the isomorphic mapping follows the isomorphism of all three groups of elements corresponding to a certain type of OCC at all levels [3]:

$$\left. \begin{aligned} A_i^{LL} \cong S_r(A_i^{LL}) \cong S_r(LL_i^A) \cong S_r(ML_{Ai}^{LL}) \\ LL_i^A \cong S_r(LL_i^A) \wedge ML_{Ai}^{LL} \cong S_r(ML_{Ai}^{LL}) \end{aligned} \right\} \rightarrow A_i^{LL} \cong LL_i^A \cong ML_{Ai}^{LL}.$$

Then, on the combination of sets, it is possible to distinguish classes of equivalence of elements according to their correspondence to a specific OCC:

Based on the properties of transitivity and symmetry of equivalence [3] and taking into account the isomorphism of groups (7), it is possible to perform a composition of relations , (

)±1, ()±1, ()±1 and bijections given by formulas (5), (6), according to the rule ξ(A, LL, ML) so that tolerance classes are formed on the set $A_1^{f_i(\alpha)}$ ($\bigcup_{i=1}^n A_1^{f_i(\alpha)} = A, \bigcap_{i=1}^n A_1^{f_i(\alpha)} = \emptyset$):

$$\xi(A, LL, ML) = \varepsilon_j^{A_{LL-ML}} \circ \tau_i^{A_{LL}} \circ \tau_i^{LL-A} \circ \tau_i^{LL-ML} \circ \tau_i^{ML-LL} \circ \tau_i^{A_{ML}} \circ \tau_i^{ML-A} = \tau_i^{\gamma(\alpha)};$$

$$\tau_i^{\gamma(\alpha)} \subset \Lambda \times \Lambda : \begin{cases} \alpha_j \in \Lambda_i \rightarrow [\gamma_i(\alpha_j) = a_j] \wedge [\gamma_{k \neq i}(\alpha_j) = \emptyset] \\ \alpha_j \notin \Lambda_i \rightarrow [\gamma_i(\alpha_j) = \emptyset] \wedge [\gamma_{k \neq i}(\alpha_j) = \begin{cases} \emptyset, \text{ якщо } \alpha_j \notin \Lambda_k \\ a_j, \text{ якщо } \alpha_j \in \Lambda_k \end{cases}] \end{cases};$$

$$i = \overline{1, n}, j = 1, \left(s = [\Lambda] = \sum_{i=1}^n [A_i^{LL}] = \sum_{i=1}^n [LL_i^A] = \sum_{i=1}^n [ML_{Ai}^A] \right), k = \overline{1, (n-1)},$$

where is the tolerance ratio based on the principle of using a single management and control protocol implemented by the function . According to formula (8), bijective mappings between the corresponding groups given by formula (7) are performed by the functions = . At the same time [3].

Each function is implemented by a corresponding driver that reproduces a specific interaction protocol between the corresponding lower- and middle-level classes. With each driver uniquely corresponds to a certain type of OKC, united in a group. Given the isomorphism (7), this driver also uniquely corresponds to the type of MPK and software module, combined into groups and [9]:

$$\gamma_i(\alpha_j) \leftrightarrow A_i^{LL}, LL_i^A, ML_{Ai}^{LL}.$$

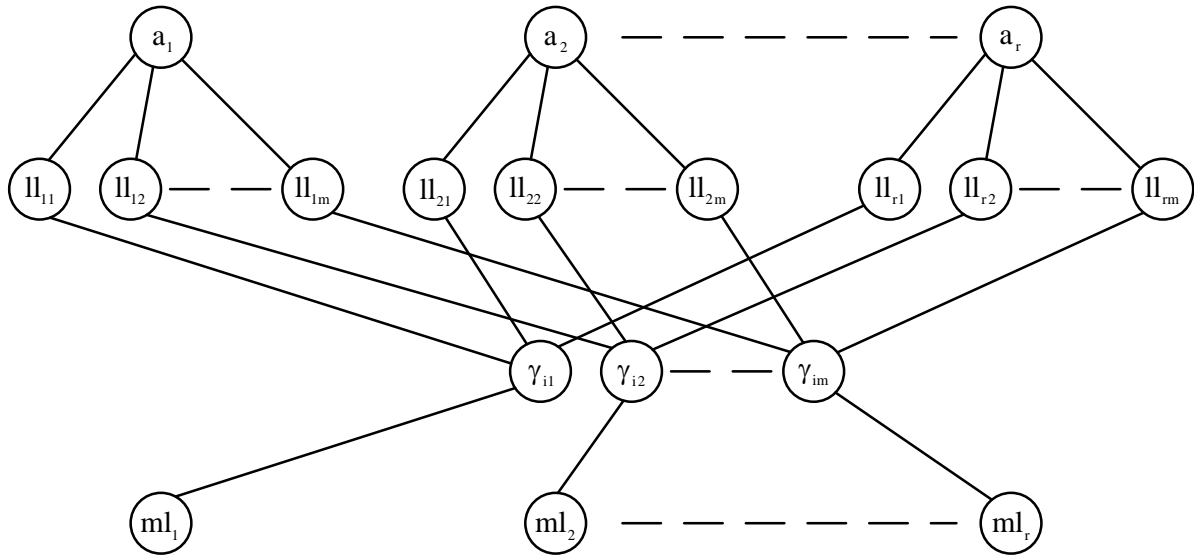
Based on the possible multicality of lower-level elements associated with reservation of the IPC, and taking into account the construction of the ACS TP software, each LL element is represented by a vector, the elements of which are represented by the corresponding information and control channels. At the same time, each function is vector, and the elements of its vector determine the components of the drivers for the corresponding channels:

$$ll_j = \vec{ll}_j = \langle ll_{j1}, ll_{j2}, \dots, ll_{jm} \rangle \xleftarrow{\gamma_i(\alpha_j)} ml_j;$$

$$\gamma_i(\alpha) = \overline{\gamma_i(\alpha)} = \langle \gamma_{i1}, \gamma_{i2}, \dots, \gamma_{im} \rangle \leftrightarrow \{LL_{i\eta}\} \subset LL_i, \eta = \overline{1, m}$$

where is the set of elements of the η-th channel in the class .

In formula (10), for simplification, it is assumed that the number of channels of each element in all classes is the same and is equal to the number m. Then, according to expressions (5) - (10), the mutual relations between the OCC and the elements of the lower and middle levels on the example of one class are determined by the graph in Fig. 1.



All relations between the corresponding elements reproduced in the composition of the graph in Fig. 1 vertices, have the character of reciprocity (therefore, the edges reproducing the relation depicted as undirected). The nature of relations is determined from the position of unambiguity by the valence of the vertices in the corresponding direction (univocality determines ambiguity, and multivalency - ambiguity).

According to the superposition of relations given by the upper expression in formula (8) and the nature of connections given by the graph in fig. 1, the numbering of elements within each class coincides with groups.

Then, based on the above statements that prove the group nature of the sets , , and the isomorphism between them, we can conclude that each class is an Abelian group of order r , isomorphic to all the above groups: . Based on the proven isomorphism between the tolerance classes at the ACS TP levels, formula (1) can be written in a more strict form:

$$\forall (a_j \in A) \leftrightarrow !\exists (ll_j \in LL) \leftrightarrow !\exists (ml_j \in ML).$$

In a similar way, it is possible to prove a mutually unambiguous correspondence between functional groups (tolerance classes) at all other (except for the lower and middle) levels of hierarchical ACS TP.

Such a mutually unambiguous correspondence, given by expression (11), allows establishing uniform principles for the synthesis, design and analysis of various levels of ACS TP, means of their research, maintenance and repair.

On the basis of the above, it can be assumed that there is a space of technical states of OKC (Ξ, S) , and (Θ, E) is a space of technical operation states. Each of these spaces, in which and are the corresponding algebras of events, are assumed to be measurable. Variants of the V maintenance strategy (maintenance philosophy) that arise in this case can be conveniently defined by the following matrix [11]:

$$V_{MP} = \begin{vmatrix} V_{MP}(S_j; S) & V_{MP}(S_j; E) \\ V_{MP}(E_j; S) & V_{MP}(E_j; E) \end{vmatrix}$$

The strategy determines the transition probabilities according to the technical conditions of the OKK as an object of operation; is a technical exploitation strategy; the strategy determines the probability of assigning the next state of technical operation; the strategy determines the

probability of restoring the operating capacity of the OKC as an object of operation. Using the matrix, you can present the maintenance strategy in the following form:

$$V_{MP}(S_j; S) = [V_{MP}(E_j; S)V_{MP}(S_j; E)V_{MP}(E_j; E)]$$

From the stated positions, the strategy defines a class of strategies consisting of three:

– a maintenance strategy that does not take into account the technical condition of the object of operation;

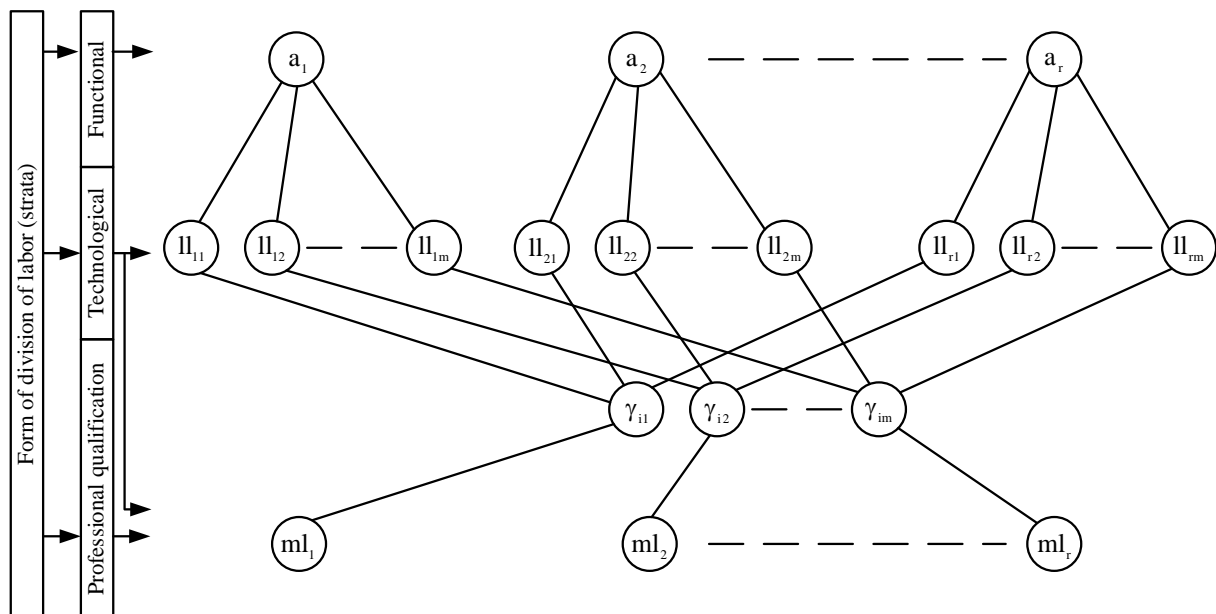
- a maintenance strategy that partially takes into account the technical condition of the facility through operation

reliable measurement of parameters and making the appropriate decision;

- a maintenance strategy that fully takes into account the technical condition of the facility through operation

reliable measurement of parameters and making the appropriate decision; in addition to monitoring the technical condition, monitoring is possible for devices with a known value of earnings using.

The graph in fig. 1 can be used to implement forms of division of labor as appropriate strategies for the maintenance process of the OKC (see Fig. 2).



The use (see Fig. 2) of stratification consists in the possible automation of the formation of technological maps and other management documents for the maintenance of ACS TP in general

Conclusions

1. A new type of abelian additive group based on a piecewise binary arithmetic operation on the indices of the functional elements of control systems is proposed.

2. It was established that the tolerance classes of technological objects of control systems, formed according to the functional principle, have all the signs of Abelian additive groups relative to the above-mentioned piecewise binary arithmetic operation.
3. On the basis of Cayley's theorem in group theory, a mutually unambiguous correspondence (isomorphism) between functional groups at different levels of the hierarchy was established and proved management systems.
4. The possibility of using proven isomorphism between functional groups to form unified principles of synthesis, analysis, design, technical maintenance and repair of various components of ACS TP, as well as means of their research.
5. On the basis of the completed functional distribution of the OKK and its managers software and hardware modules at different levels of hierarchical ACS TP is proposed formalization of the maintenance strategy of ACS TP on the basis of the state space of OKC. and its OKC in particular.

Key words: control systems, technological objects, hierarchical systems , arithmetic operation.

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**THE CONCEPTION OF RADIOLOGICAL SUSTAINABILITY POSSIBILITIES BY
REUTILIZATION OF NORM RESIDUES IN BUILDING MATERIALS**

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Abstract

Materials of terrestrial origin contain some naturally occurring radionuclides among which ^{238}U , ^{232}Th , and ^{40}K are of significance to radiation protection. These naturally occurring radioactive material (NORM) residues are generated in large quantities and would be of high economic benefit while reducing possible radiological effects on humans and the environment if they are relatively incorporated in mixtures or as additive building material production and this offers flexible reuse options depending on the final product. This is to say that the reutilization of NORM residues provides a better financial and environmental solution in reducing possible radiological effects on humans it will also contribute to NORM waste reduction, natural resources preservation, CO_2 reduction, and energy saving. According to EU-BSS (European Basic Safety Standards Directive), the characterization of NORMs as a secondary raw material for use as construction materials are necessary, however as an additive or secondary material their radiological behaviour and material properties are quite important regardless of their origin. Generally speaking, for radiological sustainability, recycling or reutilization of residue or by-products that contain NORMs, rather than disposing of them as waste, is the first consideration to achieve the re-utilization of materials in building materials and the aim of radiological sustainability. This study reviews the capability of re-production of NORM residues based on their properties and the applicable treatment before reutilization. In this regard, the assessment of radium equivalents (Raeq) and external and internal indexes (I-indexes) are useful tools to classify NORM residues before their inclusion in building products. These indexes reflect the risk of external exposure much better than the specific activity concentration of Ra-226, Th-232, and K-40. Equally, building material properties such as density and thickness should be taken into consideration when designing building materials that contain NORM residue. The result of the review concludes that mixtures or additives of NORM residues result in the reduction of activity concentration and indexes in the raw residue, and this offers flexible reuse options depending on the final product.

Keywords: NORMs; building materials; sustainability; environmental radioactivity

**THE IMPORTANCE OF PHYSICAL ACTIVITY IN ELDERLY INDIVIDUALS AND
INTERVENTION PROGRAMS FOR PHYSICAL ACTIVITY**

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ABSTRACT

This review study was conducted to evaluate physical activity in the elders, intervention programs for physical activity and to examine its importance in terms of public health nursing. A literature search was conducted in Google Scholar, PubMed, Academic Search Complete and Web of Sciences databases using the keywords 'Physical Activity, Intervention Program, Elderliness, Nursing'. English and Turkish articles published between 2015 and 2024 and whose full text was accessed were analyzed. It is reported that life expectancy has increased worldwide with the control of infectious diseases, medical and technological developments, healthy nutrition and vaccination programs. Aging is defined as a decrease in the ability to adapt to environmental factors. With aging, problems such as loss of visual and hearing functions, sleep disorders, decreased cognitive functions, anxiety, depression, unhealthy nutrition and insufficient physical activity appear. In addition to many physical and physiological changes that occur in the body with aging, insufficient physical activity can cause many health problems and chronic diseases. It is emphasized that physical activity is important for the elderly to continue their lives independently in daily life activities and to increase the quality of life. As a result of the studies, it has been stated that physical activity is one of the most important options for preventing sarcopenia, osteoporosis, falls and fractures, which are among the risks that increase with aging. As a result of another study, it is stated that physically active elderly individuals experience lower levels of anxiety and stress and have a higher quality of life compared to individuals with sedentary lifestyles. In line with the literature, it is seen that physical activity is the basis for reducing or stopping the negative conditions that occur with aging and that may occur in all body systems. In terms of solving the problem of insufficient physical activity, it is crucial to create preventive programs and intervention programs to be implemented in order to reach an adequate level of physical activity. Studies on the subject have reported that intervention programs for physical activity improve quality of life, improve cognitive functions, reduce depressive symptoms, improve sleep quality and reduce the risk of falls in elderly individuals. In line with the literature, it is

seen that physical activity is the basis for reducing or stopping the negative conditions that occur with aging and that may occur in all body systems. In studies on the subject, it has been reported that the practices carried out within the scope of intervention programs can be effective on the individual's sufficient level of physical activity. Nurses should provide education and counseling to elderly individuals about the benefits of physical activity. In addition, it is recommended to motivate individuals to participate in a physical activity program.

Key words: Physical Activity, Intervention Program, Elderly, Nursing.

INTRODUCTION

It is stated that life expectancy has increased throughout the world with the control of infectious diseases, medical and technological developments, healthy nutrition and vaccination programs (Santrock 2015, Top and Dikmetas 2015, Terkeş and Bektaş 2016, Solmaz and Altay 2019, Saçıkara and Cingil 2022, Özmen 2023). According to the World Health Organization's report on global health and aging, which states that the proportion of the elderly population is increasing in every country, it is expected that the world's population of people aged 65 and over will double (2.1 billion) by 2050 (Beard et al. 2016, Lin et al. 2020, WHO 2021, Open 2023). According to the 2023 data published by the Turkish Statistical Institute, it is seen that the elderly population has reached 8 million 722 thousand 806 people (TUIK 2024). Senile; It is defined as a decrease in the ability to adapt to environmental factors (Özmen 2023). Aging causes physiological changes such as a decrease in muscle and bone mass, an increase in body weight, cardiovascular problems, and insufficiency in respiratory functions (Özmen 2023). Due to postural changes, there is an increase in the risk of loss of balance and falling (Gao 2019, Beckmann 2020). In addition, problems such as loss of vision and hearing functions, sleep disorders, decrease in cognitive functions, anxiety, depression, unhealthy nutrition and insufficient physical activity. comes to the fore (Güneş 2021, Özmen 2023). In addition to many physical and physiological changes that occur in the body with aging, insufficient physical activity can cause many health problems and chronic diseases (Özmen 2023). The World Health Organization reports that regular physical activity provides physical and cognitive functions, strengthens the musculoskeletal system, increases the individual's level of self-confidence by reducing anxiety and depression, reduces the incidence of diseases such as coronary heart disease, type II diabetes and stroke, and contributes to the socialization of individuals (WHO 2015). , Akdeniz 2019). It is emphasized that physical activity is important for the elderly to continue their daily life activities independently and to increase their quality of life (Dugan et al. 2018, Lee et al. 2020, Erdem et al. 2021). The World Health Organization (WHO) recommends regular physical activity for all elderly individuals, with a variety of multi-component physical activities of moderate or higher intensity three or more days a week (WHO, 2022). Avoiding movement behavior leads the individual to a sedentary lifestyle over time. An individual who spends most of the day without moving is exposed to a greater risk of falling and injury as the musculoskeletal system weakens. The fact that elderly individuals continue their lives in this vicious circle is an important problem for public health (Avcı 2021). As a result of the studies, it has been stated that physical activity is one of the most important options in preventing sarcopenia, osteoporosis, falls and fractures, which are risks that increase with age (Eckstrom et al. 2020). As a result of another study, it is stated that physically active elderly individuals experience lower levels of anxiety and stress than individuals with a sedentary lifestyle, and their quality of life is higher (Oliveria et al. 2017, Anantanasuwong et al. 2022). Another study states that physical activity reduces loneliness

and provides better mental health (Song and Yu 2019). In line with the literature, it appears that physical activity is the basis for reducing or stopping the negative conditions that occur with aging and that may occur in all body systems. In order to solve the problem of insufficient physical activity, the creation of preventive programs and the intervention programs to be implemented to reach a sufficient level of physical activity are of great importance. In this review study, it was aimed to evaluate physical activity in the elderly, intervention programs applied for physical activity and to examine its importance in terms of nursing.

METHODOLOGY

The literature search was conducted in Google Scholar, PubMed, Academic Search Complete and Web of Sciences databases using the keywords 'Physical Activity, Intervention Program, Elderliness, Nursing'. Articles in English and Turkish, published between 2015 and 2024 and whose full text was available, were examined.

RESULTS

Another study conducted by Song and Yu (2019) aimed to evaluate the effects of a moderate-intensity aerobic exercise program on cognitive functions and quality of life in elderly individuals with mild cognitive impairment, and to investigate the mediating roles of depressive mood and sleep quality in the exercise-cognition relationship. Individuals aged 60 and over with mild cognitive impairment were included in the study. This study was conducted with 120 participants. Participants were randomly assigned to groups to receive either a group-based moderate-intensity aerobic exercise program or a health education program. Participants attended 8 training classes, held every two weeks. Each session lasted 45 minutes and the training was completed in 16 weeks. The aerobic exercise program was introduced gradually with gradually increasing duration from 20 minutes to the target 40 minutes over 4 weeks to increase adherence and avoid risks of injury. To reach the target time, participants performed the step exercise in multiple exercises of at least 10 minutes each, instead of a single continuous exercise, with a maximum of 5 minutes of rest between exercises. Each training session ended with a 10-minute cool-down session that included the same exercises as those in the warm-up session. Motivational strategies to ensure compliance, including goal setting, verbal encouragement, and emotional incentives based on self-efficacy theory, were incorporated into this exercise intervention. As a result of this study, it was observed that a 16-week group-based moderate-intensity aerobic exercise program improved the cognitive functions and health-related quality of life of elderly individuals with mild cognitive impairment and living in the community. In addition, it was stated that the decrease in depressive symptoms and improvement in sleep quality in individuals in the intervention group, and the exercise-cognition relationship was also significant.

In the study conducted by Chittrakul et al. (2020) in which the effectiveness of a Multi-System Physical Exercise Program (MPE) was evaluated, its effect on fall prevention and health-related quality of life in older adults with pre-frailty was evaluated. This research was conducted with 72 individuals aged 65 and over, including 36 people in the Multi-system physical exercise group and 36 people in the control group. The content of the intervention consists of proprioception (awareness of body movement and position), muscle strengthening, reaction time and balance exercise. This intervention was carried out 3 days a week for 12 weeks. According to the research results; A physical activity (MPE) program has been reported to significantly increase muscle strength by improving proprioception, reaction time,

and postural sway, as well as reducing the risk of falls in older adults with pre-frailty. In line with these results, it is recommended that the MPE program be used in primary care practices in individuals with pre-frailty (Chittrakul et al. 2020).

In the study conducted by Comellas et al. (2021), the main aim was to determine whether the intervention program improved psychological mood (anxiety and depression), social support and quality of life in a sample of people over the age of 64 who had anxiety and/or depression and/or lacked social support. to determine whether it improves or not. The other aim is to promote an active lifestyle and socialization in older individuals. This research was conducted with a total of 150 participants, 75 people in the control group and 75 people in the intervention group. The intervention group participated in a group physical activity program consisting of walking 2 days a week for 4 months. Since the participants consisted of elderly individuals, the physical activity intervention was initially low intensity. The intensity was gradually increased to a moderate or vigorous level according to the capacity of each participant. Evaluators conducted baseline interviews at 4 and 12 months. As a result of the physical activity intervention, it was observed that depression and anxiety clinically decreased, and quality of life and response to stress increased.

The study conducted by Fiorilli et al. (2022) aimed to examine the effect of physical activity on quality of life perception, nutritional status and daily life management in elderly individuals. The 244 participants in this study were randomly assigned to the control and intervention groups. During the 24-month exercise program, the intervention group performed 3 sessions per week, 1 hour each. Each training session consisted of 3 phases: a warm-up, a central phase and a cool-down. The warm-up phase lasted 10 minutes and consisted of running and walking activities. In the central phase, aerobic exercises lasting 15-20 minutes were performed using a treadmill, stationary bicycle, arm cycle ergometer and/or jogging; The duration and intensity of exercise were gradually increased over time. Entertaining music was used to encourage the effort and enjoyment required for the activity. Finally, the cool-down phase lasted 10 minutes and consisted of stretching movements. According to the results of the study, it was reported that long-term participation in medium to high intensity physical activity intervention allowed the maintenance of a good quality of life perception, a good nutritional status and activities of daily living.

In the study conducted by Galle et al. (2023), it was aimed to evaluate the effects of physical activity intervention on strength, balance, aerobic capacity and cognition measurements and to increase the number of steps of elderly individuals with low physical activity levels. This study was conducted with 102 participants with low physical activity levels. Low physical activity level is defined as an average of less than 7000 steps per day. It has been stated that this number of steps is calculated according to the Tudor-Locke translation of public health recommendations in minutes per day for elderly individuals. The study, consisting of a control and intervention group, lasted 9 months. Participants were assigned to 9 months of exercise counseling or active control. The intervention was adapted from the COACH protocol, a pedometer-based exercise counseling strategy aimed at increasing low-to-moderate daily physical activity. 7 coaching sessions were implemented throughout the intervention. It is stated that in the coaching sessions, each lasting 45 minutes, the consultant encourages the participants to improve daily physical activities such as walking, cycling, house cleaning and gardening. Participants in the intervention group were instructed to use a pedometer for 6 months of the intervention and for at least 1 month before the last measurement 9 months after the start of the intervention. Participants participated in follow-up measurements at 6 months and 9 months. It is reported that the follow-up session is aimed at developing and reinforcing newly learned physical activity behavior. It is stated that the intervention group

increased the physical activity level compared to the control group, but did not have a significant effect on physical fitness and cognition. Those who increased their physical activity by 35% or more were reported to show significant improvements in aerobic capacity, walking speed, verbal memory, executive functions, and global cognition compared to those who did not achieve a 35% increase.

CONCLUSION

It is inevitable for people to be exposed to various physiological changes in the later years of their lives. However, it is emphasized in the literature that it is possible to reduce or stop the negative situations that these changes will cause in all body systems, and this can basically be achieved by being physically active. It has been reported that intervention programs for physical activity improve the quality of life in elderly individuals, improve cognitive functions, reduce depressive symptoms and improve sleep quality, and reduce the risk of falling. Studies on the subject have reported that the practices carried out within the scope of intervention programs can be effective on the individual's ability to engage in adequate physical activity. Nurses should provide education and consultancy services to elderly individuals about the benefits of physical activity. In addition, it is recommended to motivate individuals to participate in a physical activity program.

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THE USE OF AUTHENTIC MATERIALS AS A TOOL FOR LEARNING SPANISH FOR TOURISM AND DEVELOPING THE COMMUNICATIVE COMPETENCE OF ALBANIAN STUDENTS

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Abstract

Albania is a small country that is facing an amazing development of the tourism sector. One of the nationalities that tops the list of tourists who are visiting the country the most is Spanish. For this reason, there has arisen the need to prepare future professionals in the tourism sector. This article is a reflection on the possibility of incorporating Spanish tourism content into existing ELE courses in Albania through authentic materials. This paper describes a didactic sequence carried out for Albanian ELE students. The purpose is to apply the vocabulary related to tourism in a real environment, focusing on oral expression skills, since from our experience as an ELE teacher we have verified that they present certain deficiencies in terms of oral expression skills. First, the theoretical concepts relevant to the use of authentic materials in the ELE class are reviewed. Then, the activity carried out is detailed, which consists of the design of a tour of the country that is then offered to Spanish tourists through simulation activities. Finally, there is a description of the effectiveness, advantages and disadvantages of this implementation and the degree of satisfaction. The use of teaching materials is a very good tool for Albanian learners because it serves to present new content related to Spanish for tourism, increases the level of interaction and practice of different linguistic skills, providing direct contact with the language such as used in real situations outside the classroom. This means effective learning according to the needs of students to become ideal candidates to work in the tourism sector.

Key words: communicative competence, lexicon, tourism of Spanish, authentic materials.

INTRODUCCIÓN

Hoy en día, el turismo es una de las industrias más poderosas del mundo y, como tal, tiene un gran impacto en el desarrollo económico y social de muchos países, especialmente en los países en desarrollo como Albania, donde se considera una de las fuentes más importantes de ingresos, oportunidades de empleo, diversificación de la economía, así como la promoción de intercambios interculturales. En los últimos tiempos, tras años de aislamiento bajo una dura dictadura comunista, Albania está emergiendo como un destino turístico cada vez más popular, atrayendo a viajeros de diversas nacionalidades, con un notable aumento de visitantes españoles. Este crecimiento del turismo español se debe a varios factores, incluyendo un aumento en los vuelos directos desde España, así como el interés de inversores españoles de grandes recursos económicos en el potencial turístico del país. Como resultado, Albania está experimentando un auge en el turismo, a pesar de los desafíos que enfrenta. Sin embargo, esta creciente demanda turística ha generado una escasez de profesionales hispanohablantes en la industria turística albanesa. Según los datos del Ministerio de Turismo y del Medio Ambiente (2024), el número de guías turísticos de habla hispana es limitado, solo 16 de la categoría nacional y 3 tres de la categoría local, lo que resalta la necesidad urgente de capacitación en español específicamente orientada al turismo. Ante la falta de cursos especializados en español para este fin en Albania, surge la necesidad de desarrollar un programa de enseñanza del español para el turismo. Pero por otro lado somos conscientes de que el español para fines específicos, como el español en el ámbito del turismo (EFE), es un campo importante que requiere atención especializada en el diseño de programas de enseñanza-aprendizaje y hay mucho trabajo por hacer en un país donde hasta ahora el español se ha estudiado únicamente como lengua extranjera.

Hoy en día, la lengua española se estudia en Albania en dos instituciones principales: el Instituto de idiomas "Asim Vokshi" y la Facultad de Lenguas Extranjeras, en la que el departamento de los estudios hispánicos existe desde el año 2008 y ofrece sus programas en dos ciclos de estudio, Estudios de Grado y Maestría. Además de estos, la lengua española se ofrece también en varios centros privados especializados en la enseñanza de lenguas extranjeras, pero como se ha mencionado anteriormente, en ninguna de ellas existe una asignatura o un curso que ofrezca el español turístico como lengua de especialidad para fines profesionales. Por ello, este trabajo tiene como objetivo proponer la integración de la enseñanza del español turístico como parte de los programas existentes de enseñanza de la lengua española como lengua extranjera basándonos en el uso de materiales auténticos con el objetivo de desarrollar la competencia comunicativa hacia una enseñanza aprendizaje eficaz y productiva para lo cual en Albania todavía queda mucho trabajo por hacer. De la experiencia como profesores de ELE hemos podido destacar que nuestros estudiantes de español siguen presentando ciertas carencias a la habilidad de la expresión oral. Estas dificultades surgen en mayor parte debido a que los estudiantes albaneses han sido enseñados en el mayor tiempo utilizando un enfoque tradicional, que se enfoca en la gramática de manera deductiva, el vocabulario de forma descontextualizada y la traducción de textos. Además, este método ha influenciado que se priorizan las habilidades receptivas, como leer y escuchar, sobre las habilidades productivas, como hablar y escribir. Algunos de los problemas más comunes que ellos presentan se relacionan con su grado de fluidez, la incapacidad para mantener la conversación adecuadamente al nivel alcanzado, falta de claridad en la articulación y algunos errores culturales en su uso del idioma.

En este contexto, la inclusión de los materiales auténticos en la enseñanza del idioma español nos proporcionaría por un lado la posibilidad de enseñar contenidos del español de turismo trabajando con una serie de aspectos relevantes de la lengua de especialidad como vocabulario especializado, expresiones y situaciones comunicativas específicas, términos y frases relacionadas con el turismo, y por el otro lado la oportunidad de practicar las cuatro habilidades lingüísticas (escuchar, hablar, leer y escribir) de manera integrada, centrándose en situaciones comunicativas reales, para comunicarse efectivamente en el contexto específico de la industria turística, ya sea como guías turísticos, agentes de viajes, recepcionistas de hoteles o simplemente viajeros o turistas de los países de habla hispana.

Preguntas de investigación

Este artículo tiene como objetivo responder a las siguientes preguntas de investigación:

¿Como la integración de los materiales auténticos puede dar lugar a la enseñanza del español con fines específicos (EFE), en el ámbito de turismo, dentro de los cursos de español como lengua extranjera (ELE) en Albania, influenciando en el desarrollo de la competencia comunicativa?

¿Cómo afecta el uso de los materiales auténticos en el aumento del grado de motivación de los alumnos para el aprendizaje de la lengua?

1.El uso de los materiales auténticos con el fin de desarrollar la competencia comunicativa.

Para empezar, es importante analizar la relación que existe entre el uso de los materiales auténticos y la competencia comunicativa en la enseñanza aprendizaje de lenguas extranjeras:

El concepto de autenticidad en la enseñanza de idiomas ha sido ampliamente discutido desde los años setenta, principalmente en relación con el enfoque comunicativo. Diferentes autores han intentado definir la autenticidad desde varias perspectivas, centrándose en aspectos como el texto mismo, el lenguaje producido por el hablante, tareas lingüísticas, y la capacidad de pensar y comportarse como un hablante nativo, así como el contexto social y cultural (Gebran, 2019). Para este trabajo, aplicaremos la definición de autenticidad establecida por Gilmore (2007), quien la describe como "el lenguaje real de un hablante o escritor real con un mensaje real". Esto coincide con la definición de materiales auténticos según Breen (1985), quien los define como "textos producidos por un hablante o escritor fluyente para otro hablante fluyente de la lengua". La implementación de materiales auténticos en la enseñanza de idiomas facilita el desarrollo de la competencia comunicativa de los estudiantes. Según

el Centro Virtual Cervantes (s.f.), la competencia comunicativa es "la capacidad de una persona para comportarse de manera eficaz y adecuada en una determinada comunidad de habla", respetando reglas gramaticales y socioculturales. Larsen-Freeman (2000) subraya que una característica clave de la enseñanza comunicativa de idiomas es el uso de materiales auténticos, como textos, videos o grabaciones, que reflejen situaciones auténticas de la vida real en el idioma enseñado.

La integración de materiales auténticos en los programas de cursos de español como lengua extranjera (ELE) en Albania puede ser una herramienta efectiva para enseñar el lenguaje específico del turismo. Esto podría suplir la falta de cursos de especialidad en turismo, permitiendo a los estudiantes aprender términos relacionados con destinos, servicios, actividades y atracciones turísticas. Esto les facilitaría la comunicación en futuros contextos profesionales. La inclusión de estos materiales en los manuales de enseñanza de idiomas no solo ayuda a los estudiantes a desarrollar competencias comunicativas en español, sino que también los prepara para aspectos relevantes de su carrera profesional. Esto aumenta la eficacia del aprendizaje del idioma y la preparación para el mercado laboral, independientemente de si los estudiantes eligen trabajar en el sector turístico o no.

2. METODOLOGÍA Y MÉTODOS

Para crear este artículo, la metodología utilizada fue la cualitativa. El artículo tiene como objetivo presentar una propuesta sobre cómo se pueden incluir materiales auténticos en una hora de clase de español para introducir un nuevo contenido como es el de enseñar el español del turismo a través de un vocabulario más específico que ayudaría a los estudiantes albaneses a adquirir habilidades lingüísticas que sirvieran a su nivel lingüístico para fines profesionales en el futuro. Durante el trabajo práctico con los estudiantes se analizó su enfoque hacia el aprendizaje del idioma extranjero, sus dificultades de aprendizaje, así como la motivación para aprender la lengua española del sector turístico. El método utilizado es el de la observación y a través de un "estudio de caso" se puso en práctica la integración de un material auténtico en una de las unidades del libro utilizado para la enseñanza del idioma español. Luego se analizó el resultado y su avance en relación con lo que presentaban antes de la implementación de esta secuencia didáctica.

3. Los materiales auténticos y su influencia en el aspecto emocional del alumnado.

Como se ha mencionado anteriormente, los profesores de la lengua española en Albania, durante su trabajo diario, suelen enfrentarse en el aula con un tipo de alumnado mayoritariamente pasivo, poco motivado y muy poco participativo en clase. En estas condiciones, tenemos la obligación de analizar los motivos por los que nuestros estudiantes tienen este comportamiento y al mismo tiempo reflexionar sobre ellos con el objetivo de mejorar el proceso de la enseñanza y facilitar su proceso de aprendizaje. De las conversaciones que hemos mantenido con nuestros alumnos hemos entendido algunos de los principales motivos que les hacen estar menos motivados en clase.

Algunos de los más relevantes que hemos podido destacar son:

1. Prefirieron estudiar otro idioma, pero no fueron aprobados en ese programa de estudio y no tienen el mismo interés en aprender el idioma que les tocó a estudiar. Se expresan que tienen varias dificultades (gramaticales, léxicas, funcionales) desde los niveles anteriores y esas dificultades les persiguen en el siguiente nivel que deben alcanzar. Presentan con frecuencia durante su expresión oral y escrita errores fosilizados e interferencias lingüísticas de otros idiomas que estudian y se sienten frustrados para participar en clase por no tener mucha fluidez y riqueza del lenguaje.

2. Todavía ven el error como un "enemigo" en el aula de ELE. El error se considera una sanción por la evaluación que pueden obtener y prefieren permanecer en silencio.

3. Los temas que son tratados muchas veces no son de su interés y no pertenecen a su realidad.

4. A veces se sienten desmotivados por su futuro profesional.

Dada esta situación, es crucial tomarse un momento para analizar y determinar qué ajustes son imprescindibles para incrementar el nivel de motivación entre nuestros estudiantes. Parece evidente que la falta de motivación es el factor principal que ha desencadenado todos los problemas mencionados anteriormente, convirtiéndose así en un obstáculo para su avance en el aprendizaje del idioma. Hay que aceptar que muchas veces la enseñanza del idioma no está basada ni en los materiales adecuados y ni cumple con las necesidades de aprendices. Como profesores, tenemos la responsabilidad de diseñar secuencias didácticas que sean dinámicas y que se adapten a las necesidades y preferencias de nuestros estudiantes.

Específicamente el uso de materiales auténticos en la clase es una herramienta que se propone para aumentar el nivel de motivación y satisfacción del alumno siendo que el uso de materiales auténticos incide en la creación de una experiencia de aprendizaje más personalizada. Los autores como (Herrington y Oliver 2000, Herod 2002, y Nunan 1988, como se citó en Fernandez, 2019) exploran el concepto de "material auténtico" en el contexto de la enseñanza de idiomas, identificando puntos de convergencia entre sus perspectivas. Existen tres enfoques principales para la autenticidad en la enseñanza: el enfoque comunicativo, que se centra en la interacción real; el enfoque centrado en el material, que usa recursos auténticos y relevantes; y el enfoque centrado en lo humano, que enfatiza las relaciones y la conexión personal con los estudiantes. Estos enfoques destacan la relación horizontal en el aprendizaje, el uso de textos genuinos y la conexión emocional del estudiante con su aprendizaje.

Según afirma Andrijević (2010), el uso de materiales auténticos en la enseñanza de idiomas no solo motiva a los alumnos y aumenta su interés, sino que también fomenta la interacción y la práctica de diversas habilidades. Estos materiales permiten a los estudiantes entrar en contacto directo con el lenguaje real y contextualizado, como se utiliza en situaciones reales fuera del aula. Al trabajar con materiales auténticos, los alumnos se exponen a un lenguaje genuino y actual, y también exploran diferentes aspectos culturales de los países donde se habla el idioma. Aunque el libro de texto y el cuaderno de ejercicios estén en la base de las programaciones de aula (Cecilia, 2000, como se citó Mochón, 2005) se aconseja incluir materiales reales que acerquen y actualicen la realidad hispana a los alumnos más lejanos. Los materiales auténticos rompen con la monotonía y, a veces, con el tedio que supone saber que mañana veremos la página 34 porque hoy ya hemos finalizado la 33 (Mochón, 2005).

Por otro lado, cabe destacar que la incorporación de los materiales auténticos en la clase de ELE, además de influir en el aumento de la motivación por aprender el idioma, también ofrecen la oportunidad de incluir o profundizar en otros temas que el manual de aprendizaje de idioma no ofrece. Siendo así, su utilización sería una solución para incluir la enseñanza de la lengua de la especialidad del ámbito turístico como parte de la enseñanza de la lengua española como lengua extranjera en Albania. El lenguaje utilizado en el ámbito del turismo es particular. Esto se debe a su naturaleza heterogénea, que abarca una amplia gama de temas como economía, geografía, historia del arte, gastronomía, entre otros (Calvi, 2000). Esta diversidad temática hace que el lenguaje turístico sea único, ya que engloba una amplia variedad de conocimientos y aspectos. Debido a la naturaleza del lenguaje de esta especialidad, se hace posible incluir dentro de diversas unidades didácticas materiales auténticos de diferentes géneros textuales, que coinciden desde el punto de vista semántico y léxico. Enseñar el español del turismo con materiales auténticos incorporados dentro de un curso de ELE no solo enriquece la experiencia de aprendizaje de los estudiantes, sino que también los prepara mejor para utilizar el idioma en situaciones reales y les ayuda a desarrollar habilidades lingüísticas y culturales relevantes para su futuro profesional.

4. La propuesta para la incorporación de un material auténtico en la clase de ELE con la intención de introducir la enseñanza del español de turismo.

4.1 Definición del grupo meta. Los participantes de esta implementación fueron 10 estudiantes albaneses (nivel B2) que están aprendiendo español como lengua extranjera (ELE), del primer curso de la Facultad de las Lenguas Extranjeras en Tirana, Albania. Según su programa docente de la asignatura, ellos realizan un total de 240 horas lectivas en dos semestres, y aprueban respectivamente,

el nivel A1, A2 en el primer semestre y B1, B2 en el segundo. El manual para el aprendizaje del idioma español con el que trabajan es Prisma de la editorial Edinumen.

La propuesta de incluir materiales extra durante la hora de clase surgió teniendo en cuenta elementos próximos y adecuados de las variables del grupo meta como: nivel de la lengua, formación, intereses, actitudes y aptitudes. Dos de los criterios que se analizaron con prioridad eran: el comportamiento del grupo meta, y su interés en aprender el lenguaje específico del turismo, resultado de un cuestionario realizado durante el semestre como parte de nuestro trabajo investigativo con el objetivo de reconocer sus necesidades y mejorar su experiencia de aprendizaje.

Durante las horas de clase del primer semestre, se ha observado que el grupo meta presentaba el siguiente comportamiento:

1. El grupo mostraba pasividad en la realización de las actividades, preferían mantenerse en silencio y evitaban participar en actividades grupales durante las prácticas orales o escritas. Además de la falta de interacción, ellos realizaban las tareas asignadas de forma superficial, sin dedicarles tiempo ni esfuerzo, y se caracterizaban por una baja autoestima respecto a sus habilidades en el idioma.

2. En cuanto al interés para conocer el español de turismo, en un cuestionario realizado previamente con ellos, los resultados hablaron de un enfoque positivo hacia el conocimiento del español de turismo: El 92% de los encuestados expresó interés sobre el español en el ámbito de turismo, una cifra considerable que no se esperaba. En cuanto a la tipología de actividades y materiales que preferían desarrollar al respecto, respondieron: 53.8% preferían trabajar con materiales auténticos y actividades de juego de roles y simulación, 26.9% preferían utilizar materiales preparados por el profesor, y solo 19.2% querían trabajar con un manual tradicional para la enseñanza del idioma, con el que aún se sienten familiarizados (Dani, 2024).

Analizando los dos criterios anteriores, pensamos en observar los efectos que tendría en el comportamiento de los estudiantes la inclusión de un material auténtico como material adicional en una de las unidades del libro PRISMA que ellos utilizan para el aprendizaje del idioma, encontrando la idoneidad para introducir el nuevo material. El objetivo era incluir el material adicional en una unidad didáctica planificada para la clase como parte de toda, pero agregando el nuevo contenido y léxico aprovechando para la realización de una nueva tipología de actividades de acuerdo con sus necesidades de aprendizaje del idioma.

4.2 Los criterios que se tomaron en cuenta para la selección del material auténtico y su incorporación en el material oficial de aprendizaje.

Usar materiales auténticos en clase tiene ventajas y desafíos. Es crucial analizar sus características y cómo pueden ser aprovechados pedagógicamente. Además, su uso debe adaptarse a los objetivos del plan de estudios y a las necesidades de los estudiantes para una adquisición efectiva de los contenidos. Con el objetivo de encontrar la idoneidad temática para la presentación del material auténtico en la hora de clase, se analizaron los temas de cada unidad del libro Prisma, y se decidió que lo más apropiado era incorporarlo en la Unidad 21 del manual Prisma titulado: "El martes, ni te cases, ni te embarques" en el que se presentaba léxico relacionado con los viajes, aeropuerto y equipajes. La siguiente duda era como el material auténtico se podría convertir en un material didáctico. Según Coscarelli (2014) cuando hablamos de material didáctico, nos referimos a recursos y herramientas que hacen más fácil enseñar y aprender en contextos educativos. Para transformar un material auténtico en un material didáctico es necesario evaluar, en principio su extensión, complejidad léxica, morfológica, sintáctica y cultural, para luego incluirlo si resulta adecuado al nivel dentro de una serie de actividades que conformen una unidad didáctica.

Si vinculamos las habilidades del estudiante con los niveles de referencia del Marco Común Europeo de Referencia para las Lenguas (MCER), en esta etapa del aprendizaje (final del curso del nivel B2), el alumno exhibe las siguientes habilidades:

“Es capaz de entender las ideas principales de textos complejos que traten de temas tanto concretos como abstractos, incluso si son de carácter técnico, siempre que estén dentro de su campo de especialización. Puede relacionarse con hablantes nativos con un grado suficiente de fluidez y naturalidad, de modo que la comunicación se realice sin esfuerzo por parte de los interlocutores. Puede producir textos claros y detallados sobre temas diversos, así como defender un punto de vista sobre temas generales, indicando los pros y los contras de las distintas opciones” (Consejo de Europa:2002).

Para hacer un análisis detallado de los criterios que consideramos a la hora de seleccionar el material auténtico con el que trabajaríamos, nos basamos no solo en la adecuación al nivel de los estudiantes (B2) sino en otros criterios importantes definidos por Andrijevic (2010) en su artículo “Reflexiones en torno al uso de los materiales auténticos en la enseñanza de lenguas extranjeras”. Algunos de los criterios más importantes que se analizaron para la selección del material auténtico fueron: las características y el nivel del grupo meta, su ajuste a los objetivos de la unidad en la que la incorporamos, el análisis preliminar de las necesidades de los estudiantes a través del cuestionario realizado, los fines didácticos que se pretendían lograr relacionados con el aprendizaje de un lenguaje específico (turístico) dentro de situaciones específicas de la comunicación, las destrezas planificadas para practicar eran la lectora, oral y escrita. El contenido del material seleccionado era adecuado no solo al nivel de la lengua que poseían a los alumnos, sino a su edad, a sus intereses, experiencias y exigencias y se tuvo en cuenta la facilidad de su explotación y el estímulo que proporcionaría para la realización de una serie de actividades.

Decidimos que el material que se incorporaría como parte de la lección 21 del libro Prisma sería un itinerario turístico para visitar Albania en 6 días por los turistas españoles.

4.3 Objetivos

1. Ampliar el vocabulario: Introducir y practicar léxico relacionado con lugares turísticos, actividades recreativas, servicios turísticos, etc.
2. Desarrollar habilidades lingüísticas: Mejorar la comprensión lectora, así como la expresión oral y escrita en español, a través de la descripción y narración de lugares turísticos.
3. Fomentar la interacción comunicativa: Promover la comunicación en situaciones turísticas simuladas.

4.4 Duración: 9 horas de 60 minutos

4.5 Destrezas practicadas: destreza lectora, oral y escrita

4.6 Metodología

Para llevar al cabo este trabajo consideramos métodos efectivos para aprovechar didácticamente el material auténtico como son el enfoque comunicativo y el enfoque por tareas. Estos métodos presentan la ventaja de conectar el idioma aprendido en clase con actividades fuera de ella. Según Álvarez (2005, como se citó en Pinilla, 2017), por ejemplo, en el caso de la enseñanza del español de turismo la enseñanza a través de tareas se adapta muy bien a las necesidades específicas del aprendizaje. Las tareas permiten cumplir con las demandas lingüísticas y funcionales de los profesionales del turismo que están aprendiendo español, al tiempo que requieren que los estudiantes utilicen competencias comunicativas específicas para lograr objetivos claros y resultados concretos.

Al utilizar estos métodos hicimos posible emplear el material introducido con un objetivo específico que era ampliar el aprendizaje del léxico relacionado con los viajes, aeropuerto y equipajes (contenido léxico de la Unidad 21 del Prisma) con el vocabulario específico que se utiliza en itinerarios turísticos. Además de esto pudimos incluir tareas significativas, reales y que motivaron a los alumnos como la creación de itinerarios de visitas de diferentes ciudades de Albania, presentaciones orales de ellos, práctica de vocabulario específico a través de actividades de role play y escritura creativa.

5. La descripción de las actividades realizadas y su impacto en el comportamiento y avance de los estudiantes.

Para estructurar las actividades dentro de la nueva unidad didáctica que creamos con la introducción del itinerario turístico se siguieron los siguientes pasos:

Actividades de precalentamiento:

Como actividades de precalentamiento se utilizaron las actividades 1.1 y 1.1.1 de la Unidad 21, pg. 222 del manual Prisma.

1.1 ¿Sabes qué significa el refrán "En martes, ni te cases, ni te embarques? En tu cultura, y haciendo referencia a la buena o mala suerte, ¿qué aspectos son importantes a la hora de viajar?

1.1.1 Si vas a viajar, y pensando en los preparativos, ¿cuáles son las cosas que tienes en cuenta? ¿Qué es lo que nunca falta en tu maleta?

Estas dos actividades de la expresión oral ayudaron para introducir el tema de la unidad que se relacionaba con los viajes. A continuación, se trabajó con las actividades 1.2.1 pg. 223 del libro "Incidencias con el equipaje" y 1.2.3. pg. 224 con el objetivo de practicar el contenido funcional y léxico establecido en el manual: Dar instrucciones para llevar al cabo una reclamación. Léxico relacionado con los viajes, aeropuerto y equipaje. Trabajamos con estas actividades porque se trata de una integración del material auténtico dentro de lo que los estudiantes tienen previsto de aprender en su guía docente.

Para la incorporación del nuevo material se siguió la siguiente estructura de actividades:

Actividades introductorias:

Presentación del itinerario turístico mostrado imágenes de diferentes sitios descritos en el itinerario "Explorando los patrimonios de Albania en 6 días", y preguntamos que sabían de ellos.

Actividades de comprensión:

Pensamos trabajar con el itinerario turístico elegido para que los estudiantes se familiarizaran con el vocabulario utilizado en él. Les proporcionamos a los estudiantes una lista de palabras relacionadas con el turismo y el itinerario, como nombres de lugares, actividades turísticas, transporte, comidas típicas, etc. Les pedimos que investigaran el significado de estas palabras y crear un pequeño glosario bilingüe.

Actividades de producción:

Como actividad de producción pensamos trabajar con la redacción de un itinerario de una de las visitas de las ciudades que se visitaría durante el viaje descrito en el programa turístico. El objetivo era utilizar vocabulario y estructuras gramaticales aprendidas para describir los lugares a visitar (aprendido a través del material auténtico) y el libro del texto (dar recomendaciones).

Dividimos a los estudiantes en grupos y asignamos a cada grupo la tarea de crear un itinerario turístico para una ciudad específica del programa del viaje. Los estudiantes deberían incluir lugares de interés, actividades, horarios, medios de transporte, etc. El programa del viaje presentado desde el principio les sirvió como guía.

Actividades comunicativas:

Primera parte de la actividad: Les pedimos a los estudiantes que presentaran a los grupos de los estudiantes sus itinerarios turísticos al resto de la clase. Durante las presentaciones, pudieron practicar el uso del vocabulario específico relacionado con el turismo y explicar las razones por las que incluyeron ciertos lugares o actividades en sus itinerarios.

Segunda parte de la actividad: Organizamos actividades de role-play donde los estudiantes simulaban ser guías turísticos y turistas. Pudieron practicar el uso del vocabulario específico mientras daban y recibían información sobre los lugares incluidos en el itinerario.

Actividades de cierre:

Como actividad de cierre les pedimos a los estudiantes que escribieran un episodio de algún viaje a modo de "libro de viajes" (actividad 3.4, manual Prisma, pg.234). Esta actividad les ayudo aplicar el vocabulario aprendido de manera creativa y desarrollar su habilidad de escritura creativa. También sirvió como una actividad de evaluación para medir el progreso de los estudiantes.

Al final de la clase realizamos una discusión abierta sobre su experiencia de aprendizaje, haciendo preguntas como qué aprendieron, qué actividades encontraron más útiles y cómo aplicarían lo aprendido en un viaje real.

RESULTADOS

Después de realizar esta serie de actividades tanto del manual Prisma como actividades relacionadas con el material auténtico, nos dimos cuenta de que los estudiantes presentaron una actitud mucho más positiva que antes: ellos eran mucho más participativos, motivados y con un mayor sentido de logro porque se sintieron capaces de comprender y utilizar el contenido aprendido en las situaciones simuladas en clase. Este sentimiento de éxito aumentó su confianza en sus habilidades lingüísticas y comunicativas.

DISCUSIÓN

Aprender un idioma extranjero general es útil en una variedad de situaciones, pero aprender la lengua de especialidad de un campo específico proporciona beneficios adicionales en términos de comunicación efectiva, acceso a recursos específicos, empleabilidad y precisión en la comunicación en campos técnicos o profesionales específicos.

CONCLUSIÓN

Además de aumentar la motivación de los alumnos, el uso de materiales auténticos permite consolidar conocimientos previos, crear situaciones de comunicación real, introducir nuevas estructuras lingüísticas, mejorar la adquisición del idioma y reducir el temor al error. También mejoran el rendimiento del alumno y refuerzan su capacidad para comprender el idioma cumpliendo así el objetivo principal de la enseñanza moderna de idiomas: mejorar la competencia comunicativa del estudiante.

Por todo esto consideramos necesario incluir materiales auténticos en nuestras clases. Además de que te ofrecen una experiencia de aprendizaje personalizada, basada en sus necesidades e intereses, nos brinda la oportunidad de incluir nuevos temas y problemáticas acordes con el desarrollo económico y cultural de nuestra sociedad. Esto promueve el aprendizaje de idiomas para necesidades reales relacionadas con las demandas del mercado laboral e incide en el despertar del interés de nuestros estudiantes que se siente que alcanzan objetivos útiles.

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ANEXO

Explorando los patrimonios de Albania en 6 días.



Un viaje a través del patrimonio cultural de Albania y Macedonia

Día 1. Aeropuerto – Kruja

Llegada a Albania. Encuentro con la guía y traslado al hotel en Kruja para el almuerzo.

Después del almuerzo visitaremos el casco histórico de Kruja, con su fortaleza, su Museo Etnográfico e Histórico y su bazar típico otomano.

Una parte de la visita se puede efectuar el día siguiente por la mañana. Cena y el alojamiento en Kruja.



Kruja: Después de haber sobrevivido por miles de años, estuvo a punto de desaparecer durante inicios del siglo XX, pero revivida en los últimos 50 años, Kruja es una atracción turística con una vista espectacular desde la montaña. Lo más importante de esta ciudad son la fortaleza con su ciudadela y el bazar tradicional. El Museo de Scanderbeg, héroe de la ciudad que luchó durante 25 años contra la invasión otomana en el siglo XV, y el Museo Etnográfico son las atracciones más famosas de la ciudadela. En cuanto al antiguo bazar, es el típico mercado oriental que ofrece todo tipo de antigüedades y artesanías hechas por la gente local de la región.

**APPLICATION FOR THE IMPACT OF TOURISEM MARKETING ON THE
ECONOMY IN THE REGION OF SARANDA, ALBANIA**

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Abstract

This study examines the influence of tourism marketing on the economic development of a country. Tourism marketing has a key role in promoting tourist destinations, increasing income and creating employment opportunities. Through innovative marketing strategies, a tourist destination can enhance its attractiveness and benefit from new and returning visitors. Additionally, tourism marketing contributes to the development of tourist infrastructure and the improvement of services for visitors.

In this study we analyze the specific case of the city of Saranda in Albania that has benefited from the tourism marketing strategy to develop its economy. The findings of this analysis provide a deeper understanding of the link between tourism marketing and economic development, highlighting the importance of sustainable investments in promotions and developing the tourism sector.

Findings from this analytical processes prove that Saranda has preconditions as well as human and material potential to develop tourism in profitable sector that will strengthen economic development, open new job and significantly improve the living standards of citizens of Saranda, and not only.

Keywords: Economic development, potential source, macroeconomic stability of the national economy.

1. Entry

Marketing has a very important impact on the functioning of the economy of the Republic of Albania, increasing the possibility of tourism in foreign markets. The implementation of marketing in Albania enables the transformation of the economy by increasing competition and increases the production of attractive products for foreign markets.

Marketing can also play an important role in other sectors of the economy, such as agriculture, tourism, agribusiness, etc. Albania has much natural potential for the development of tourism due to excellent geographical position.

Most of these assets are still in potential, not being organized and used as tourist products. The non-utilization of these resources has led to the non-absorption of the income that could come from tourism, no further development of the country and tourism-supporting industries. Many areas in Albania, with natural and cultural potentials, live in poverty, which has in some cases damaged many of our national assets. In addition, in general, the young people of these beautiful but poor areas see their future far from Albania, at a time when young people are one of the valuable demographic assets for the development of tourism.

The topic of the paper is about the importance of marketing in tourism, as an indicator of the country's development. Tourism is a very sensitive sector, where it's planning and

development must be done prudently. Tourism has a variety of economic impacts, direct and indirect. Tourists contribute to sales, profits, employment, tax revenue, etc.

The direct effects occur within the main enterprises, in hotels, restaurants, tourist agencies, retail trade, etc. Indirect effects include the supply of businesses with all the necessary goods and services related to tourism. This means that, through indirect effects, tourism affects all other sectors of the economy. So, tourism is a main economic activity and leader for the economic development of Albania.

2. Purpose

With this paper, I aim for my study on this topic to be a contribution to the marketing of Saranda as a tourist destination and to elaborate as little as possible on the importance of tourism in the economic development of the country. Saranda is a coastal city in the south of Albania, close to the border with Greece, a place that has wonderful beaches on the Ionian Sea.

Saranda is a small paradise that has all the conditions to spend a wonderful vacation such as beaches with small natural stones, a wonderful blue sea, as well as incredible views that take your breath away.

There is a lot of beauty in this city and it is rightly considered as one of the most modern resorts in the region that offers many attractions for visitors.

The exceptional beaches, the view, the historical sites, the 'Blue Eye', the reasonable prices, are some of the reasons that Saranda is considered one of the most modern resorts in the region that offers many attractions for visitors.

In addition to the favorable conditions that Saranda has, a very important role is played by the marketing of this tourist destination, both by the government and private businesses.

3. Literature review

Based on the work of the authors Misra & Sadual (2008), tourism is very popular in every country of the world. Where, everyone has experience, ideas, desires for it, because it is an unavoidable activity for every human being. A living being cannot to remain static to nature and thus it must move.

Tourism has gained popularity from the rapid development by the US, who were eager to organize tours, due to too many activities and too little free time. Tourism includes a wide spectrum of activities such as: excursions, picnics, student trips, pilgrimages, conferences, etc.

The first definition of tourism is that of Littre in 1889 who says: "Tourists are travelers who visit foreign countries for curiosity, entertainment, making a type of tour in places that have been previously visited by their countrymen."

L.J. Lickorish says: "Tourism represents all movements of people outside their community for all purposes other than migration or regular work. The most frequent reason for this movement is for holidays, but it will also include, for example, attending conferences and moving for business purposes."

Gupta says: "Tourism is first and foremost a service industry, where the main products offered are the tourism business, experience and hospitality. These are intangible and difficult but crucial products."

While Prof.Dr.Bakiu, in the book "Tourism Management", she elaborated on the evolution of tourism, the tourist system, types and forms of tourism, tourist products and their marketing, etc. International tourism in developed countries has been promoted in three main directions:

1. Technical assistance for the preparation of tourism development plans
2. Support for large infrastructure projects
3. Support for investments in private tourism plans, especially hotels.

Even the European Community is involved in tourism policies to facilitate tourism in the community, to improve seasonal and geographical tourist distribution, to provide information and protection for tourists, improvement of employee conditions and organization, consultation and cooperation.

Marketing is also the primary tool to increase positive economic effects. Today, marketing techniques are still dominant in tourism planning. Over time, the marketing techniques used become more and more complicated, including considerations and understanding of tourist behaviors, segmentation and consumer choice. (Zenelaj, 2013)

Researchers in the field of tourism made it clear that good tourism planning should include benefits in all aspects of the community, including sociological aspects (eg promoting community stability, family solidarity, cultural identity), economic (eg employment, income), environmental (eg protection / conservation). (Sharpley & Telfer, 2002).

Tourism as an economic category for sustainable development, together with the development and changes of the world economy in the structure of activity and the participation of specific sectors in GDP (gross domestic product), national income and employment of the workforce. (Ministry of Trade and Industry, KS & Ceku, 2014).

Based on the analysis of the medium-term tourism development strategy of the southern region, and the development plan of the city of Sarande 2013 - 2025, as well as other tourist indicators and economic, it can be concluded that tourism is likely to become a leading sector in the long run in the next decade, thus contributing to economic growth, the generation of new jobs and social prosperity in the region. In this context, the long-term goals of the development of tourism as an economic category with continuous growth trends will:

- a. To stimulate the continuous growth of the local economy by attracting investments in the tourism sector and other sectors that interact with it,
 - b. To use the capacities of the local economy also as a tourist destination,
 - c. To ensure that Saranda is the main tourist destination in Albania,
 - d. To ensure the stability and continuity of the growth of the tourism sector,
- (Municipality of Sarande).

4. Tourism as an economic category for sustainable development (Saranda's Region)

Together with the development and changes of the world economy in the structure of activity and the participation of specific sectors in GDP - gross domestic product (gross domestic product), national income and labor force employment.

In the last forty years, major structural changes in the global economy have been reflected in a growing trend of services, in an important part of the tertiary sector of the economy (trade, tourism, insurance, transport, banking, finance, education, engineering, etc). There is almost no country whose economy does not have a significant share of the service sector.

In this way, for the economies of medium developed and less developed countries, services represent an important opportunity for more serious involvement in the international division of labor. In all this, tourism occupies an important place, as one of the most profitable and largest industries in the world. Despite the uncertain political and security situation in the world, as well as the economic crisis, a general increase in tourism trends is expected, as well as the economic effects of tourism.

Tourism has become a social phenomenon that characterizes our era and in the last half of the century it is characterized by dynamism and massification.

There are activities in the territory of Saranda Municipality 3,800 businesses, 870 accommodation units, hotels, family residences, about 370 bars and restaurants operate in the territory of Sarandë Municipality. In the last two years, the number of businesses has increased by 20%.

Only along the new Promenade, around 150 service and entertainment entities operate, such as bars, restaurants, fast-food, seasonal artisans, tourist boats (85) as well as 12 accommodation units, of which 4 are newly built or reconstructed hotels.

This year there are over 700 full-time and seasonal employees. The requirements to carry out marine tourism activity for the year 2024 have increased by 65%.

After the completion of the investment in the Promenade and the stairs of the city, the value of the buildings in the area has increased by 30-40%.

As a result of the investment and marketing made by the government, an increase in the number of tourists is observed, which translates into economic growth of the city, bringing more income for businesses and more opportunities for employment.

The organization of events initiated by the Project for Integrated Urban Development and Tourism, such as Saranda Beach Games, Saranda Folk on, etc., had a positive impact on local and foreign tourists and showed interest and stability for every age group. The promotion and marketing of the destination, the events that accompany the season, influence the recognition and promotion of the values of our cultural and historical heritage.

9 second-level banks operate in the territory of Saranda Municipality. During 2022-2024, lending for investments in hotels and service units increased by 70% compared to 2021.

(Municipality of Sarande, March 2024).

An indicator of the economic development that the city of Saranda has had is the income and the number of jobs that this city has had. The incomes during the last 5 years realized by the businesses are follows:

	Year 2019	Year 2020	Year 2021	Year 2022	Year 2023
Income	2.265.717.000	1.830.666.000	2.055.293.000	2.339.266.000	2.956.902.000

(Sarande Tax Directorate)

With the exception of 2020, which has had a decline compared to 2019, as it is the year that countries were isolated as a result of COVID? In 2021, there is a 12% increase compared to 2020. In 2022, there is a 13.8% increase compared to 2021. In 2023, there is a 26.4% increase compared to 2022.

	Year 2019	Year 2020	Year 2021	Year 2022	Year 2023
Average number of employees	10.196	9.614	10.165	10.592	11.084

(Sarande Tax Directorate)

In 2021 there is a 5% increase in employees compared to 2020. In 2022 there is a 4.2% increase compared to 2021. In 2023 there is a 4.6% increase compared to 2022.

The role of marketing, both by businesses and the government, has had a positive impact on both income and the number of jobs created.

The 2024 season has started earlier than a year ago. Local and foreign tourists are present in the territory since the first months of the year. Bookings so far promise a good season with a 30-35% increase from the previous year.

5. Problems and Challenges of the Sector

- Lack of well-known hotel "brands" and tourist operators Well-known hotel brands and tourist operators, for the vast majority of foreign tourists, are a guarantor of the quality of service and, at the same time, serve as a guarantor of the reliability of a destination. Currently, there are no international hotel brands operating in Sarande, neither in the main cities nor in the tourist areas.
- Lack of tourist infrastructure In Albania, apart from the natural beauties, additional tourist infrastructure is almost non-existent. Amusement and recreation parks, conference and fair centers, yacht harbors from which vessels can be launched for underwater tourism or marine tourism, etc. are almost not present at all.
- Lack of standardization and classification system In Albania, accommodation structures and providers of other tourist services are not classified based on the standards for the services they offer.
- Short tourist season Although Albania has a typical Mediterranean climate, which means that our country enjoys a full 250 days of sunshine, again the tourist season in Albania is limited only to the months of July and August.
- Informality in tourist activities Many of the accommodation structures, but also other service providers, such as restaurants or tourist guides, operate in complete informality, creating the ground for services of a low quality, affecting the safety of tourists and the image of the country.
- Few connections through air and sea transport Albania's ports and airports offer few travel options for foreign visitors. With the exception of Italy, direct flights and sea connections to many of Europe's major cities and states are lacking. - Weak infrastructure in the destination 14 The infrastructure in the tourist destinations still leaves much to be desired, starting from the energy and water supply networks, and continuing with the roads connecting the destinations, parking spaces, etc.

(Ministry of Tourism)

6. Recommendations

Some of the recommendations to develop tourism marketing are:

1. Investments in road infrastructure to make travel easier for visitors.
2. Increase in foreign direct investment in general.
3. Creation of an institutional and legal framework, and a strategy in accordance with economic, social and environmental factors.
4. Better management of airports, accommodation of foreign visitors and creation of security.
5. New constructions preserve typical traditional architecture and materials (such as: stone, wood, etc.)

6. The increase of accommodation units, in order to improve the conditions of the current accommodation units and build new units.
7. Creation of financial policies to enable soft loans for the opening of hotel enterprises, vegetables, flower-greenhouses, etc.
8. Determining the most attractive areas, attractions that attract visitors, such as attractions for children, arrangements to entertain visitors, etc.
9. Protection of the environment, it is important to define a plan and immediate measures to protect the environment.
11. The formation of leading groups of tourists, who have knowledge of the terrain, knowledge of foreign languages, knowledge of first aid, knowledge of the history and tradition of the area, communication skills, etc.
12. Improvement of conditions and services to tourists, which can be accompanied by training courses on traditional cuisine.
13. Inclusion in the budget, both by the government and by business, of an amount that will be earmarked for marketing.

WOMEN IN THE UNIVERSITY: ADVANCES AND FRUSTRATIONS

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ABSTRACT

This work is about Education, Science, University, and the work women do in these three areas of knowledge, mainly in the University as a teacher, a researcher, a doctoral thesis advisor among other activities. The University, since the beginning was a place created and done by men. Although this idea is not entirely true because there have been at least one university created by a woman (Al Quaraouiyine, founded in 859 by Fatima al-Fihri in the city of Fez in Morocco), and from time to time a woman has invaded this male recant and achieve to study and work there. Historic data and statistics show that University is still preferentially a place of men. This work is part of a larger investigation and the method used to generate data was through online questionnaires with open questions that were sent by e-mail to professionals from several areas and various functions that work in Brazilian Universities. There were 208 valid returned questionnaires, and by means of qualitative analysis of the answers, we tried to deepen the knowledge of their perceptions about their place in the institution. Results show acceptance of their condition but frustrations too, that include from administrative issues to political themes, as, for example, to work many hours in classroom but few hours in research, or depreciation and carelessness by Administration and Government. Also, environment is seen as intimidating and there is institutional machismo and other gender gaps. There is strong belief in individualism (weight of individual characteristics), but the perception that imposed difficulties by environment and by work conditions can be prejudicial appears, mostly when there is evident suffering.

Keywords: University, Women, Academic Career.

INTRODUCTION

Concern on harmonic social and economic development is an assumption for equality that is fundamental to Human Rights. To accomplish and grant this equality, institutions are in a central place. Among these central places we emphasize the University that produce citizenship, professionals, and teachers to many degrees of formal education.

Nowadays the indicators of equality or inequality evaluation of the women and men insertion in science are still limited. The obstacles imposed by gender and work connections, the sexual work division, as well as the productive/reproductive work issues (Helena Hirata & Daniele Kergoat, 2007; Daniele Kergoat, 2009) are important elements of reflection. There are many things that can be obstacles for women career. Universities have “mechanism that set up sexual bias socially existent” (Fiuza, Pinto & Costa, 2016, p. 805). Many of these women that work in universities is frustrated. Accordingly, Renu Jalal & Monika Rani (2023, p. 267) “frustration is an emotion that occurs in situations where a person is blocked from reaching a desired outcome or goal. In psychology, frustration is a common emotional response to opposition, related to anger, annoyance, and disappointment”. They also say:

Actually, Frustration is the emotional state that a person experience when needs, wants and desires are not by the person help she becomes frustrated. Generally, when we make a effort to achieved a goal in order to live happily and function effectively but we could not get success and try again and again, but we can get a positive response, it gradually converted into the frustration. There are several factions responsible for such situation in other words a variety of obstacles or barriers in the satisfaction of our needs and desires. This result in frustration. It is dominating factor influencing the individual behavior (p. 267).

This work is about Education, Science, University, and the work women do as teacher, researcher, doctoral thesis advisor among other activities. As almost people know, education is not a neutral word. History shows that it depends on its cultural basis. If the Culture incentives autonomy and freedom, education will proportionate the development of this qualities. Occidental and Oriental cultures sometimes permit this possibility and many times do not permit. When the matter is women in both cultures, it is very difficult to see they could be accepted as autonomous and free citizens. This situation is very clearly in the History of Education, Science, and the University. All over the world and every time.

The University, since the beginning was a place created and done for men. Although this idea is not entirely true because there have been at least one university created by a woman (Al Quaraouiyyine, founded in 859 by Fatima al-Fihri in the city of Fez in Morocco), and from time to time a woman has invaded this male recant and achieve to study and work there, historic data and statistics show that University still is preferentially a place of men. As Stefania Giannini (2021) writes in the Foreword of the UNESCO/IESALC (2021, p. 6): Women in higher education: has female advantage put an end to gender inequalities?

Whether aggregated or disaggregated, the numbers alone do not reflect how women continue to report working and studying in climates that privilege males’ perspectives and organizational and leadership approaches. Besides, the data reveal that women studying and working in post-secondary institutions hit glass ceilings, experience gender-related wage disparities, and face the threat and reality of sexual harassment and violence on campus. Issues such as these, along with the complexities associated with demographic differences such as race, sexual identity, and women’s socioeconomic status, help shape women’s experiences in higher education and thus must be taken into account when assessing progress toward gender equity.

Nowadays it is quite different from the past, but not so different that women do not have to fight to conquer a place everywhere they want. The fight to the right of study and work in a university is very well known in the History of the University (Patsy Parker, 2015).

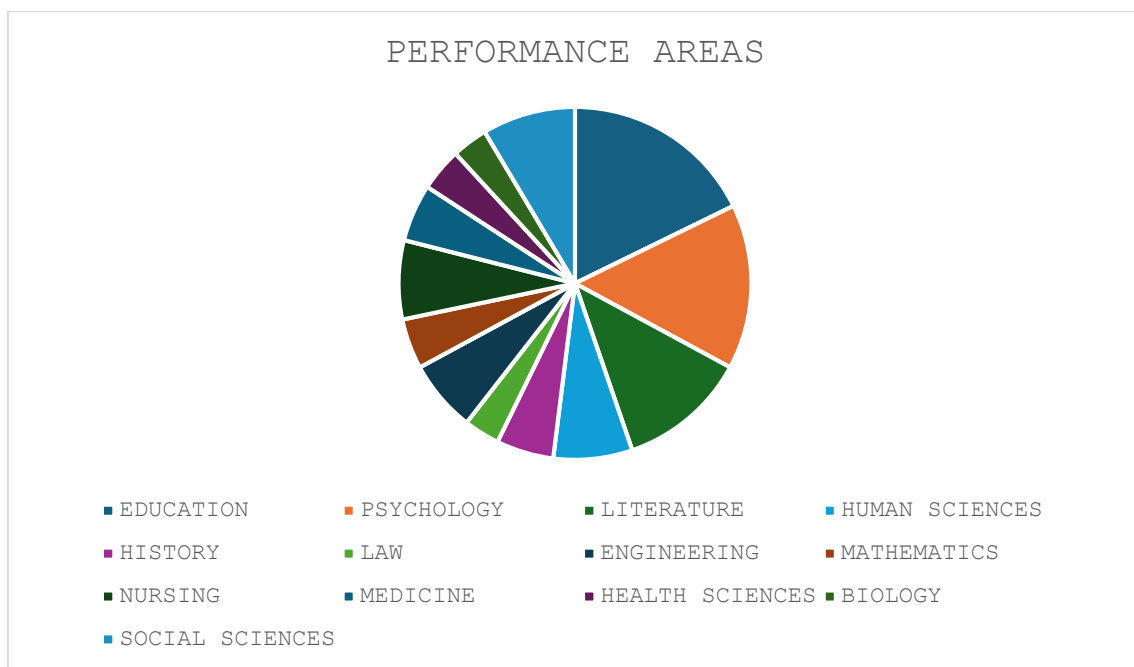
This work is about a part of this problem. Here we are going to present some partial data of a research on women in Brazilian Academy, specifically their frustration in their work.

MATERIALS AND METHOD

The research-Base of this work is titled “Women in the Academy: Place, limits, oppressions and overcomes”. We wanted to know what perception academic women have about their place in the university; their satisfaction/dissatisfaction with the work in the university; the advantage/disadvantage of being woman in the university; which personal characteristics help/hamper the career in the university; if there are work-family conflicts, and their life projects. They were also asked to answer the Self-Reporting Questionnaire – SRQ20, which estimates prevalence of common mental disorders (CMD) (Gonçalves; Stein; Kapczinski, 2008) and questions concerning demographic data.

Here we are going to present the frustration women said about their work in the university through the questionnaire, and about what are the obstacles they must face. Online questionnaires with open questions were sent by e-mail to professionals that work in Brazilian Universities near the end of 2021. There were 208 valid returned questionnaires, with 335 answers showing what helps and 268 that describe difficulties for women academic career. By means of qualitative analysis of the answers, we tried to deepen the knowledge of their perceptions about their place in the institution and about what they say that helps and hampers their careers. The answers were grouped in not priori set up categories and these categories formed dimensions according to the degree of proximity among them in relation to specific themes.

Who are these women? They were 207 people that answered the questionnaire and are from many places of Brazil and work in many areas of knowledge and kinds of superior institutions:



RESULTS

First of all, we present our participants:

Number of women respondents: 207

Women living with consort: 129 (62%)

Women with children: 138 (66%)

Women living alone: 37 (18%)

Women with relatives with superior degree: 127 (61%)

Educational level: Doctorate and Post Doctorate (173 = 83,6%). Master or Specialization (34 = 16,4%)

Time in the university: Until 8 years (70 = 34%). From 9 to 15 years (68 = 33%). 16 years or more (69 = 34%)

Women that did not answer to the question about frustrations: 10

Women who said they do not have any frustration in the university: 62 (30%).

Categories found in the frustration perceptions:

WORK TOO MANY HOURS IN CLASSROOM

Many of the women are contracted by hour to be in classroom teaching specific classes in the career course (example: social psychology in Psychology; Hermeneutics in Philosophy etc.). Their wage corresponds to how many hours they are teaching in classroom. So, if they want a good salary, they must do many classes.

GET FEW HOURS TO RESEARCH

- Strain for productivity X Few hours to research (Everybody in each faculty or Institute is strained to publish a lot of articles, books and so on. Nevertheless, there are few paid hours for researching. Funds is scarce and they must dispute hard).
- Lack of Funds, Structure and Time.

DEPRECIATION AND CARELESSNESS

- University Scrap (Many of Public Universities are suffering of lack of Funds because the former Government in Brazil cut down much money for the university every year (in 2022 the cutting was in three billion “Reais” (“Real” = Brazilian money)).
- Low wages.
- No-recognition (women feel although they work very hard, they receive little recognition).
- University seen by former Government as a place of frolics, riots, quarrel, and drugs use (This kind of judgement was in every speech of the former President).

UNIVERSITY ENVIRONMENT SEEN AS INTIMIDATING

Women feel the university environment intimidating because there are extreme competitiveness. People fight for funds, positions, hours to research and so on.

There is Moral and sexual abuse, violent competition, Toxic relationships. These are words of an academic woman: “Little rest, a lot of work, little Money, a lot of pressure”.

INSTITUTIONAL MACHISMO AND OTHER GENDER GAPS

- Women work hard – Men manage (Despite women are majority as teachers in almost every area, they are few in high positions such as coordinators, head of department and so on).
- Sexist language (Portuguese is a Latin language and a very sexist one. There are few neutral words, plural is masculine and so on).
- Unequal treatment (women must do everything right and men are excused when they do not do right).

DISCUSSION

The categories above are just some of the most frequent frustration women say to have about their work in the university. Nevertheless, many of them do not feel any frustration as we say before. Times are changing and women have made many advances. Nevertheless, as Denise Wilson (2019, p. 2) states, referring to the field of Engineering, but that is perfect to understand any field of work, research shows that role models have an important impact on career pathway decisions made by women engineering students. But we can say the same about other areas. Most engineers are first exposed to the profession through their STEM faculty, so if this group is not diverse, or if diverse workers (such as women) are perceived to be unhappier at work than colleagues. This may have an impact for women engineering students that will have multiplicative effects on future workforce diversity. The author states too that there is a correlation between male numerical dominance and lack of female persistence in any career field, not just STEM or higher education. Numerical male dominance refers to an environment in which men outnumber women while normative dominance refers to an environment where the culture of expected behaviors is associated with males (Denise Wilson, 2019, p. 3). This kind of outcomes are related to a “chilly climate”.

Accordingly, to K. Dana Britton (apud Denise Wilson, 2019, p. 3) the chilly climate is defined as concepts in a context specific to women in academe to include “harassment by students and colleagues, inhospitable department and classroom climates, biases in hiring processes, inequitable allocations of work responsibilities, and policies that penalize women’s greater role in managing work/family responsibilities”.

As Denise Wilson states (2019, p. 4), gender roles and unconscious bias also play a part in the lived experiences of women faculty in STEM (and other areas), although these influences are perhaps the trickiest to detect. This includes unspoken (and often carry a sanction for those who violate these norms. People are often unaware of these biases or how the biases shape their own thoughts and actions. This can impact women faculty through hiring, promotion, and daily work culture, and it is more than a minor inconvenience. Research has shown that gender harassment leads to “anger, anxiety and depression” as well as “over-performance demands” for those targeted (Denise Wilson, 2019, p. 8).

In the same way, Marian Baird and Colleagues (2018, p. 6) states that research shows that for 80% of working women, being treated ‘with respect’ was viewed as an essential part of their relationship with their manager and/or employer. In the present case, the employer is the university. However, there was a significant gap between this aspiration and their working reality. In practice, only two-thirds (68%) said they were treated with respect, 48% said they received adequate recognition at work, and 56% felt valued at work. These authors also state that:

In the issue of Equality, less than a third of women surveyed (31%) thought men and women were treated equally in the workplace; in contrast 50% of men thought this is the case.

However, when asked to think about their own job, women were more positive, with 615 saying that they experienced gender equality.

A publication of UNESCO/IESALC (2021) about women in higher education detach important elements of this kind of work for women. Regardless of encouraging statistics on women access to higher education, women still encounter obstacles when seeking to occupy key academic positions in universities, to be involved with relevant research, and to take leadership roles. Otherwise, women are overrepresented among teaching staff at lower education levels, while their presence is markedly lower in tertiary education (vertical segregation). The same is true in school management and education policymaking. Women are also still underrepresented as senior faculty and higher education decision-making bodies in many countries (UNESCO/IESALC, 2021, P. 8).

In this report, UNESCO IESALC reviews some available global data on the topic of women in higher education, taking into account developments in women's participation in higher education, and in this way contributes its expertise to this important debate. If women constitute the majority of undergraduates, then why are they still a diminishing minority among lecturers, senior lecturers, and professors? Why are there few women researchers and published authors? If women and men receive the same type of university education necessary to attain professorship, and are expected to perform the same tasks, then why are they receiving different wages? With more women than men studying and graduating, what is preventing highly capable women from occupying half the seats at the head table? These are important questions to ponder, and included here below, is a brief analysis of a few probable reasons for this (UNESCO/IESALC, 2021, P. 9).

The rise of the female advantage in higher education

Over the past few decades, there has been a rapid increase in higher educational attainment worldwide. The reversal of the gender gap in education accompanied the dramatic increase in educational attainment. Much of this growth is due to the increase in women's educational attainment. Over time, women caught up with men's education levels and progressively attained higher levels of schooling than men. Whereas decades ago, there were more males than females enrolled in and graduating from tertiary education, a greater increase in women's educational attainment over the past decades led to the convergence of female and male attainment pattern, first in most industrialized countries and then in a growing number of developing countries (Heath & Jayachandran, 2016, apud UNESCO/IESALC, 2021, P. 15). The data, disaggregated by gender, show that educational attainment in industrialized countries not only converged to relatively equal levels between genders but that female attainment continue to rise faster than male attainment and led to a growing gender gap between women in higher educational attainment (Julia Plötz, 2017, apud UNESCO/IESALC, 2021, p. 15).

CONCLUSIONS

When there is interest in social and economic harmonious development, one purpose is the equality principle that is fundamental to the Human Rights. For implementation and grant of this equality, institutions have a central role. Among them we emphasize the university as a citizen, professionals, teachers, and researcher formative for all degrees of formal education.

There are different degrees of equality. Among the fundamental we detach the gender equality in interception with race/ethnic groups, social class, sexual freedom, and other markers of personality development and of human happiness. For example, the dissimilar gender role, standard, social rules, and expectation about what is proper to men and women, affect desires,

behavior, choice and acting in public and private life, resulting, many times in inequality and iniquity (Susana Farber; Miguel Angel Verdinelli; Mehran Ramezani, 2012). Many actions trying to breaking this situation are derived from academic institutions, as an effect of collective work of teachers, researchers, students, administration, and managers.

Nevertheless, Mieke Verloo e Emanuele Lombardo (2007) say that in spite of the symmetry between gender and efforts, we can see a gap between speech and action. The inequality and iniquities are still present and are well representative in social and professional life of men and women around the world, in developed or not developed Countries. Two-dimension public and private are key to the conceptualization of main structures that contribute, sustain, and reproduce gender inequality and other inequalities. They are interconnected, made by rules, values, institutions, and organizations that reproduce the gender inequality in each one of these field of action.

As all institutions, university environment brings expectations in society relative to its acting. Through teaching, research and extension, superior education reaches its mission. University, origin of new knowledge, cannot just reflect society. It's mission is becoming inductor of necessary changes for the development in the sense of an equitable society (Patricio Alberto Cullen, 2009), being prospector and protagonist. The University must be cohesion factor for human groups diversity. Accordingly, to Jacques Delors (1999), equity and equality principle must guide superior institutions politics. However, research linking education and equality, or inequality demonstrate that in spite of being supposed the principles of equality for everybody, the teaching institutions can be employing insidious mechanisms of discrimination (Gloria Bonder, 1994).

Some women do not feel frustrated about their place in the University. However, some do feel frustrated in many aspects. They work a lot, dedicate themselves much more and the outcomes are frustrating. There is inequality, precariousness, and a lack of stimulation to the academic work. Much of this situation come from the former Government distrust over thinking institutions and the consequent cuts down in funds and the gender inequalities that are yet very strong in the Country. Presently in Brazil, things are better, and a new recognition in Science and Technology, Humanism and Social Forces are growing. Nevertheless, there is much work to do in the search of equality in many aspects of the social life: gender, class, ethnicity and all de other social markers of representativity.

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TRENDS AND SCIENTIFIC PRACTICE: FROM AESTHETICS TO PHILOSOPHY OF MEDIA

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Abstract

In recent decades, interdisciplinarity has been one of the prioritized trends in scientific thinking and practice. This is likely because, methodologically speaking, today's understanding of the world is so fragmented that it's almost impossible to reconstruct the whole from it. The narrow specialization of knowledge has led contemporary science to a kind of absurdity – "not being able to see the forest for the trees" – where overly fragmented knowledge leads science into a sort of dead end. The main paradox of this "progression" of scientific knowledge lies in the fact that narrow specialization leads to expertise that loses its scientific connotation, or the meaning related to both the knowledge of the whole and its constituent parts. The primary task of interdisciplinarity today is to bridge the gap between science and narrowly specialized knowledge, i.e. between science and expertise, in favor of science. Part of this issue will be demonstrated through the comparison of aesthetics (a traditional discipline) and philosophy of media (a sub-discipline stemming from aesthetics but falling into distinct interdisciplinary-defined scientific/philosophical knowledge). Narrow specialization leads to knowledge fragmentation and a paradoxical situation in which expert knowledge can lose its scientific relevance and meaning in the context of overall knowledge. The main goal of interdisciplinarity is to overcome the gap between specialized expertise and general scientific knowledge, thus advancing science as a whole. Through the example of comparing aesthetics and media philosophy, we can observe how the interdisciplinary trend evolved from aesthetics, developed into a sub-discipline, and then became an autonomous discipline in contemporary scientific and philosophical research. This process demonstrates the complexity and significance of interdisciplinarity in the subtle transformation and integration of different fields of knowledge for a deeper understanding of contemporary phenomena.

Keywords: Science, Philosophy, Interdisciplinarity, Specialized Knowledge, Aesthetics, Philosophy of Media.

In antiquity and the Middle Ages, knowledge was viewed as a unified whole, encompassing subjects such as cosmic phenomena, social life, and the realm of mathematics. The modern era, marked by the emergence of capitalism, introduced a significant shift. From the old bodies of knowledge that described the world as a totality (e.g., philosophy and mathematics), new specialized fields of knowledge began to branch out, each focusing on restricted areas of investigation. The division into disciplinary domains dethroned philosophy, which had once been the queen of knowledge, giving rise to new fields characteristic of the modern age—sociology, psychology, anthropology, art history, among others.

Simultaneously, the erstwhile holistic worldview (initially unified by philosophy and later by religion during the Middle Ages) fragmented into separate entities that were no longer conceived synthetically but rather analytically (the era of rationality). The division of labor among disciplines and the fragmentation of knowledge domains paralleled the segmentation of work processes (industrialization and narrow specialization). Thus, knowledge became expert-driven, fragmented into numerous disciplines and sub-disciplines. Over time, the proliferation of diverse subjects, areas, and research methodologies compromised the integrity of knowledge itself, transforming it into expert trivialities devoid of meaning and insight into the totality of cognitive endeavors.

The absurdity of knowledge lacking self-awareness (knowledge about knowledge), which descends to the level of “expertise,” generalized case studies, and meaningless procedures as absurd as debating how many angels can stand on the head of a pin, has demonstrated that modern science has found itself in a cul-de-sac of meaninglessness. It has become necessary to reconnect science with itself, that is, with its own disciplines. From this need emerged, first, multidisciplinary, soon followed by interdisciplinarity, and finally, transdisciplinarity. The merging, comparative research, convergence of theories, their mediation and interpenetration, and ultimately, their disciplinary transcendence and unification into a higher synthesis appear to be leading trends of the contemporary era. What lies behind this trend in modern research practice? The answer to this question can be sought in the ancient yearning for the (lost) totality of knowledge (a unified worldview), for all-encompassing hypotheses/theories (the last of which seem to have been the theory of evolution, the theory of relativity, and the currently prevalent quantum theory), and for syntheses of knowledge that sciences have largely lost by endlessly circling around themselves. In this context, this paper will analyze and compare two scientific disciplines that originated from philosophy and, as such, return to philosophy as their starting point and foundation: aesthetics and philosophy of media.

Philosophy of media, as a newer research (sub)discipline, declares itself as philosophy by its very name. This implies a fundamental aspiration towards wisdom and is founded, in Platonic terms, on the erotic desires for truth and wonder (Aristotle). However, this also brings about a conflict with pre-existing philosophical disciplines—particularly those that, in their scholastic discourse, adhere to rigid traditions, neglecting the numerous challenges of the contemporary era. For our time, especially within Western civilization, can scarcely be conceived without media; thus, even contemporary philosophy, which, bypassing the archival call, attempts to grasp its time in thought—as Hegel notably recommended—cannot but consider the fact that media significantly influence our lives today. Even from a common-sense perspective, contemporary media largely occupy and create public space, with some theorists even asserting that they aggressively colonize it. Philosophy, in our opinion, should at the very least reflect on this and treat media as a relevant subject of investigation.

Therefore, if contemporary philosophy were to look around and step out of high schools, universities, institutes, and scientific and professional journals into the streets, it would confront the current issues that demand specific questions. One such challenge is the world of media. This is not only because media should represent a relevant subject of contemporary philosophy, but also because they aim to alter reality, a process occurring right before our eyes. This does not imply that philosophy of media envisions itself on the streets as a non-academic, marginalized subdiscipline striving to penetrate the ivory towers of universities, defended by the ramparts of

various prejudices. Rather, it simply means that it has not yet established itself and that this fact is currently not of great importance to it, which may be its main comparative advantage over other research fields that philosophy habitually clings to. The question arises, however, as to why philosophy as such persistently turns a blind eye to the world of media and what twilight it anticipates.

The struggle for the recognition of self-awareness, waged between so-called grand philosophy and its later derivatives, such as psychology or sociology, for instance, is not yet over, and already a new front is opening — philosophy of media appears to be a potential threat to the comfortable and professionalized forms of contemporary philosophizing. Regardless of this fact, philosophy of media persists in its philosophical nature and its reference to its parent discipline (the field of knowledge), which significantly distinguishes it from undifferentiated theories or media studies. In short, it recognizes itself as philosophy in the full sense of the word and, although insufficiently recognized, strives to engage with its time. If, in doing so, it is treated as a fad or a consumable, this speaks more to a certain consumerism that has infiltrated the realm of contemporary philosophy, corrupting it from within, than to its own value. Moreover, the struggle for "recognition" is not conducted solely in theoretical waters; philosophy of media seeks to be active. Its critical positions are not criticism for its own sake but an aspiration to change reality. To that extent, its perspective may be non-philosophical, as philosophy of media, as we see it, aims to evolve into a revolutionary theory, thereby, through the dynamics of *Aufhebung*, abolishing itself while simultaneously realizing itself in reality.

The aforementioned erotic aspirations of philosophy of media can, among other things, rely on sensuality as an extensive subject of philosophical inquiry, but also on its non-sensual aims. These aims, in the broadest sense, can be speculative or ontological on one hand, and critical on the other, which, of course, are not mutually exclusive; rather, this highlights the beginning and focus of the desired investigations. Philosophy of media, whose method and subject are simultaneously the philosophical investigations of the media world, is a relatively new branch of philosophy. However, even before the constitution of philosophy of media as a (sub)discipline, philosophy itself engaged with its subject matter.

Methodologically speaking, however, having "more pressing matters" throughout its long history and dealing with traditional topics, philosophy has avoided framing its old-new subject, that is, media, until recently, not considering it relevant and worthy of philosophical reflection. Until our time, philosophy has not actually endeavored to open a separate chapter of examination that would concern media and media culture.

In contrast to its stance towards media as a subject of inquiry, philosophy, in its aesthetic orientation, has touched upon the theme of sensuality as if there were no room for (technically) mediated sensuality in this realm. At best, the sphere of sensuality was treated for the purpose of concept growth through language and dialectical movement. As an older philosophical discipline, although it emerged much earlier, aesthetics took a long time to establish itself, investigating its subjects within the domain of sensory knowledge. On this thorny path, it endured criticism and disqualification, long being considered a lower-order epistemological theory. Philosophy, conceived as ontology, viewed aesthetic subjects from the heights of ideas and concepts, which almost entirely occupied its thinking. The subjects of philosophical reflection - beauty, the

sublime, nature, art, etc. - seemed like the periphery of reflection, or its murky and deceptive depths.

In the context where aesthetics long enjoyed a status of "lowness" due to the scope and themes it dealt with for centuries, it was difficult to imagine that its influence in the media sphere had any chance of success. However, what has been and remains common to both aesthetics and philosophy of media is, certainly, philosophy itself — specifically, the kind that deals with sensory knowledge. The deceptive nature of the subject itself conditioned the approach to the knowledge generated within the frameworks of aesthetics and philosophy of media. Moreover, what was common to both aesthetics and philosophy of media was precisely the relationship of philosophy to sensory knowledge, relating to the negative determination of that knowledge, which fell under the concept of illusion, more precisely — the aesthetic illusion. Whether concerning beauty or art, for instance, from a cognitive standpoint, they usually carried minimal truth value and were thus regarded as less valuable.

Founded as a theory of ideas, perception, or sensory knowledge, aesthetics struggled to maintain its relevance to the entirety of philosophy in its fundamental pursuit of truth. Relying on the domain of re-examining phenomena, and more narrowly considered — on aesthetic illusion (though not solely on that), it managed to defend its autonomy to some extent by tying itself precisely to appearance, rather than to truth. In the realm of phenomena, aesthetics found its refuge, as well as a reservoir of various research subjects. Simultaneously, it expressed the ambition to transcend the phenomenal, striving for truth and its, for instance, “setting-into-work of the truth of being” (Heidegger).

Although only one of the many themes of aesthetics, the so-called “aesthetic illusion,” which has often been contrasted with the matter of truth and its corresponding reality — evoking earlier times, spanning from the disputes between Socrates and the sophists to the present day — has become more significant for contemporary aesthetics than ever. With the decline of interest in truth in our era, its relativization, suppression, or “abolition” (Lyotard’s “announcement” of the end of the so-called “grand narratives”), the measures of reality, including sensory reality, have significantly transformed. This change occurred as a result of the expansion of the realm of aesthetic illusion (which once referred to sensory deceptions) into many areas of life. What is the main cause of this expansion of aesthetic illusion? Naturally, it is the multiplication and systemic influence of first mass media (press, radio, television), and later, the new communications enabled by the advent of the internet.

Thus, contemporary aesthetics was, in fact, compelled to reintroduce the theme of aesthetic illusion into its research, as we have thoroughly discussed in the text: “The Aesthetic and the Real: Media – Art – Life” (Vuksanović 2020: 113-124). Aesthetic illusion, by itself, would not have gained a significant place in contemporary aesthetic investigations if the media had not, more than ever before, occupied reality while simultaneously pretending to replace it with various simulations. In short, “Contemporary aesthetics, if it aspires to comprehensiveness in its research endeavors, should mark both life (the aesthetics of everyday life) and its relations with reality, as well as the various media mediations, as relevant subjects of its inquiries, which also have a unique relationship with reality.” (Vuksanović 2020: 114).

These relationships with reality (whatever we may imply by it) often appear in our time as media-mediated forms of communication. "Sensory reality, as the subject of aesthetics in the broadest sense, today presents itself in the domain of its philosophical problematization in two ways: primarily, through the re-examination of the aesthetic reality that has always already existed and has been the subject of aesthetics so far, depending on the interpretive perspective of observation, epistemology, and ontology; and secondarily, as the reality/illusion produced artificially — whether it pertains to the realm of art (philosophy of art) or the field of media activity (philosophy of media). Thus, conditionally speaking, aesthetics establishes a dual relationship with reality: directly and indirectly. Hence, we would say, the ultimate reach of contemporary aesthetics lies in its efforts to critically re-examine all existing sensory modalities of reality, regardless of how they come into being, as well as their intersections and dialectical mediations" (Vuksanović 2020: 114).

Two key moments logically preceded the constitution of the philosophy of media, both related to inquiries within the domain of aesthetics. Besides the aesthetic illusion, which has undoubtedly been a focus of contemporary aesthetic research in various ways, the topic of communication has also become a subject of inquiry from both aesthetic and aesthetic standpoints. This revealed the need to establish a new aesthetic sub-discipline – the aesthetics of communication. Although it has not yet made a significant theoretical impact on contemporary philosophical culture, the aesthetics of communication has mediated between general aesthetics and its discourse in specific areas of applied philosophy. The aesthetics of communication has sought to address the "aesthetic (sensory) aspect of communication" (Vuksanović 2018: 393); focusing on the aesthetic experience of communication, it has treated, in this context, nearly all sensory phenomena of our time. "The standpoint of the aesthetics of communication," as Jean Caune asserts, "is yet to be fully developed. It aims to understand, on one hand, the social processes that represent expressiveness in communication (advertising, personal development, entertainment), and, on the other hand, the phenomena of aesthetic expression that constitute one of the functions of communication (media, performances, social ceremonies)" (Caune 2001: 8). Considerations related to art, marketing, and other aestheticized market forms of communication have further served as a link established between aesthetics and the philosophy of media. Certainly, it is unnecessary here to emphasize why the philosophy of media emerged, as many see it, as a subdiscipline of aesthetics. The analogy with the emergence of the philosophy of art, at a time when it became clear that the study of the sphere of art had matured sufficiently to warrant a degree of independence from other subjects of aesthetics, served, it seems, as a guideline for the philosophy of media and its subject matter. This is especially so considering that, etymologically, "techne" is the root word signifying an origin common to both art and technology (media). Furthermore, communication aesthetics has also facilitated, as we have highlighted, the establishment of a connection between aesthetics and the various modalities of contemporary communications, whereby media today are, so to speak, synonymous with numerous forms of communication.

In the book *"Philosophy of Media: A Short History of Ideas and Innovations from Socrates to Social Media"* by Robert Hassan and Thomas Sutherland, the initial focus of research on the intertwining of philosophy and media discourse is linked to the advent of phonetic writing. This development in ancient Greece, approximately five centuries BCE, had a significant impact on the society and culture of that era (Hassan, Sutherland 2017: 15). Consequently, the popularization of literacy (i.e. reading and writing) was profound and dramatic in its effects, and the legacy of this transformation can still be seen in the philosophical tradition today (Hassan, Sutherland 2017: 15). Indeed, this study, seeking the foundations of philosophy of media from a contemporary perspective, retrospectively identifies the beginnings of its original problematization in the

thoughts spanning from the pre-Socratics and Socrates, through Plato, to Aristotle, focusing on the speech-language-writing relationship (Hassan, Sutherland 2017: 15-29). Citing insights from Paul Levinson, the authors highlight that Plato, appearing after Socrates who avoided written words, was the first philosopher to dedicate sufficient attention to the question of media, affirming Levinson's assertion that Plato and his contemporaries were "the original media theorists," or at least "the first we know of" (Hassan, Sutherland, citing Levinson 2017: 19). From then until the contemporary era — a timeline traced by this study — much has changed, so that today, in addition to writing, the so-called old media include print, radio, and television, i.e., the so-called mass media, while the new media begin with the era of the internet.

The preparatory phase for constituting the reflective frameworks for philosophy of media coincided with the emergence of mass media. The greatest contributions to its foundation came from theorist and linguist Marshall McLuhan, philosophers Walter Benjamin, Theodor Adorno, and Max Horkheimer, Günther Anders, and later theorists such as Jean Baudrillard, Paul Virilio, and many others. In more recent times, a significant contribution to the constitution of philosophy of media was made by Taylor and Saarinen with the publication of their imagological (media) study, which emerged as a correspondence between the two authors from different cultural backgrounds (Taylor, Saarinen 1994). Although initially it did not receive a reception that qualitatively affirmed it, this was literally the first published book that dealt with the ontology, or the philosophy of media in the contemporary era.

The general context of the creation of this book was conditioned by the social changes brought about by the advent of the internet, namely the global networking of telecommunication technologies, which, among other things, enabled the electronic exchange of messages between the two authors. Using the imagological approach to view "otherness," borrowed from literary theory, Taylor and Saarinen, each from their own cultural and media perspective, jointly and interdisciplinarily reflected on the contemporary world of politics, economics, education, religion, etc. A significant characteristic of their correspondence is the internet as a medium, serving as the ontic basis that enabled their interaction and exchange of ideas.

It could be said that, in recent times, the roots of philosophy of media actually trace back to the relatively neglected teachings of Marshall McLuhan, especially those concerning so-called media ecology, which generally refers to the overall impact of media on the environment (not only in the narrower, ecological sense of the word). As Levinson asserts, discussing McLuhan and the 1950s and 1960s, media ecology provided insights into how media communications influence the opinions and actions of people and society, defining this influence as a kind of not "superficial," but "soft" impact (Levinson 2000: 17). Following McLuhan, as Levinson further develops the idea, the field of media ecology came to include the teachings of cultural theorists and aestheticians such as Lewis Mumford or Susanne Langer, for example (Levinson 2000: 17).

In attempting to define more precisely what philosophy of media is — whether it is merely discourse or something more, whether it is a science, discipline, or sub-discipline, when it emerged and what issues it fundamentally investigates, whether it falls within academic frameworks of knowledge or is too dispersed and elusive for them — questions arise that undoubtedly trouble not only emerging disciplines and sub-disciplines but also all "recognized" fields of philosophy, which are necessarily self-reflective in their (historical) progression, or are not philosophy at all. Just as aesthetics struggled with disciplinary establishment and the verification of the relevance of its

research subjects, which remains an issue today, philosophy of media seeks its own identity, while, in addition to external challenges from "older" disciplines, it also doubts its origins, history, and purpose. This, in our understanding, makes it a philosophy, unlike related theories of media, communication studies, sociology, and psychology of media, etc. One thing is certainly indisputable. The so-called media reality is so present in our daily lives that media, by their very nature, impose themselves as a significant subject of study for our time. Hence, the seemingly urgent need for philosophy of media.

One approach that connects philosophy of media with both philosophy (which is natural) and aesthetics, mentioned in Zsigfrid J. Schmidt's text "Philosophy of media - A Reasonable Programme?" (Schmidt 2008), involves the following. Specifically, the unique orientation in contemporary philosophical-media approaches focuses research efforts on reformulating traditional philosophical themes, thus placing them within the framework of current media events. The list of such themes is quite extensive and covers almost all well-known philosophical themes related to reality, truth, culture, society, and the like. According to Schmidt's opinion, these philosophical themes are now translated into topics such as time, space, emotions, the subject, or entertainment, which are predominantly leading themes in contemporary aesthetics.

In addition to aesthetics, philosophy of media also inherits its knowledge from metaphysics or ontology, drawing on teachings ranging, as we have already indicated, from Aristotle to Heidegger. Authors like Kittler, for instance, consider the overall "conditions" that philosophy as metaphysics (including Heidegger's aesthetic reflections) prepared for the emergence of either concrete media (such as the press, telephone, etc.) or theorists, such as McLuhan, who anticipated the emergence of philosophy of media with their works. Indeed, the widespread use of new communication technologies has influenced the (ontic, and even ontological) change in reality, as well as philosophical interpretations of this media-altered reality. According to Kittler, for example, in our time, glasses and phones correspond "one-to-one" with Aristotle's eyes and ears. In the subsequent analysis, the same author argues that technical media have replaced the former psycho-physical ones, concluding that traditional ontology, which is nearing its end or destruction, has transformed into an ontology of "distance, transmission, and media" — in essence, into media ontology. Although philosophy, viewed from a historical perspective, occasionally reflected on media (such as ether or water, for example), Kittler believes that it still neglected its own technical media, "from ancient volumes to modern bestsellers." In other words, since its emergence in written form, philosophy has utilized technology — specifically, writing has been, alongside dialogue, both its tool and, simultaneously, the technology of historical transmission (which also had physical and aesthetic aspects). Despite this, Kittler believes that it was precisely philosophy, before any other theories, that forgot which media supported its practice. And finally, this author concludes that throughout its history, philosophy literally "neglected" its media side.

This centuries-long neglect of the media aspect of philosophy is currently being addressed by philosophy of media, although it's essential to bear in mind that philosophy as a whole has evolved alongside its media experiences. Thus, today, we could generally say that we have reached a sort of co-evolution of media, society, and reality, and our daily experiences (corresponding to aesthetic experiences understood in the broadest sense — sensory experiences) are theoretically formulated by synthesizing the dialectics of experiential (historical) movement, starting from writing to the emergence and use of the internet.

In this context, the emergence of so-called new media once again draws attention to both the media and appearance as such. For example, Peter Simons, in a conference draft entitled "Media and their Emergence: The Ontology," explains the concept of appearance in the context of discussions about the status of life and mind from the 19th century to the present day. On the one hand, the draft emphasizes that philosophy pays sufficient attention to the theme of appearance, but on the other hand, it does not address the specifics concerning the perception of the media and their taxonomy as much as needed. Therefore, the author concludes that more effort should be invested in ontological inquiries, which are a prerequisite for understanding the media, taking into account interpretations of ontologically based aesthetics, such as the theoretical observations of Roman Ingarden, for instance, regarding the ontology of art.

According to Simons, the main goal of such research would be to offer tools for constructing a rational ontology and, furthermore, a taxonomy of media that opens up space for the emergence of new and "unexpected media." Based on fragments from this draft, it can be concluded that philosophy of media, as it is shaping and practiced today, is partly immersed in the fund of general ontological questions and sometimes in those specific to the ontology of art. On the other hand, it participates in the world of appearance, or in the circle of typically aesthetic research problems. What remains somewhat unclear and undefined is the opening for the emergence of "unexpected media," which, in fact, we consider more as an advantage than an interpretive shortcoming, considering not only the development of technology but also the new, multidimensional relationships currently established between aesthetics, ontology, and, ultimately, philosophy of media and their (possible) objects of inquiry.

Gazing simultaneously backward and forward, philosophy of media endeavors to establish itself, drawing on both ontological and aesthetic legacies (interdisciplinarity) and nurturing a problem-oriented approach to inquiry. It has also become one of the many battlegrounds of contemporary philosophy, fighting for its "place in the sun." In this pursuit, there is a constant sense of being the child of its era, akin to what aesthetics once experienced while vying for recognition as a philosophical discipline.

Technically speaking, the genesis of philosophy of media owes much to the stimuli coming directly from the media, often articulated in the course of email exchanges among authors interested in this subject matter. One such example is Lovink's text: "Discipline Design: The Rise of Philosophy of media, An Email Exchange with Frank Hartmann (Vienna)." This "designing" of philosophy of media aimed to describe its current state. Interestingly, from the very theme of artistic shaping ("designing"), though typical of contemporary methodologies, one can discern a connection with aesthetics and its research subjects.

In the same article, Lovink explains, in the context of discussions about philosophy of media in German-speaking countries, how opponents of philosophy of media have not adequately clarified the controversy surrounding this concept. He simultaneously distances himself from the assertion of controversy, considering it uncertain whether it even exists. Externally, the resistance to philosophy of media appears as a "failed cockfight," calculated against non-existent institutional arrangements, all amidst a time of increasing student numbers and decreasing education budgets — a general trend affecting contemporary higher education systems beyond German-speaking areas.

Furthermore, like all academic disciplines, philosophy of media grapples with the advent of computers, a development that has progressed significantly, as illustrated, for instance, by the use of ChatGPT, an artificial intelligence capable of answering many questions and generating texts.

As Lovink highlights, technology today is not merely the subject of study but, by generating knowledge and storing it in databases and networks, it transforms the learning process itself.

Referring to Frank Hartman, who was interviewed by Geert Lovink (an online conversation conducted in 2000), the article's author asserts that, when discussing philosophy of media as an emerging discipline, Hartman referred to Friedrich Kittler's media theory and the "small dirty practice of 'network critique'" (Lovink 2004). In the subsequent email dialogue, according to Lovink, Hartman summarizes his new work and contextualizes the discussion by directing it toward two perspectives. For some philosophers, Hartman believes, according to Lovink, media and networks are a fad that will fade over time without impacting the 'eternal' philosophical questions, while others are convinced that philosophical practice will fundamentally transform, especially after the process of integrating new media into today's social currents is complete (Lovink 2004).

In the continuation of the text, Lovink sharply criticizes Taylor and Saarinen's book *Imagologies* and the Anglo-Saxon approach to this topic, openly stating that the publication significantly contributed to the "degradation of the concept" (of philosophy of media and ontology) and that, although initially conducted in online communication between students and media researchers, it is "tragically superficial" (Lovink 2004). Moreover, Lovink adds that merely affirming technology, instead of "negating" or at least bypassing its "PR phase," does not deserve special reflective attention, with one exception: radical futurism (such as transhumanism), which he believes is the only aspect worth philosophical discussion (Lovink 2004).

Our comment on Lovink's emphasis on transhumanism as a potential subject of philosophy of media research is that a critique of transhumanism (as a theoretical fad, vulgar and insufficiently reflective materialism, and dystopian communication practice) is indeed necessary. This critique should be as radical as the apologetics of this ideological (idolatrous) movement of late capitalism. This is important because general aesthetics can hardly reach all parts of the transhumanist puzzle critically; thus, philosophy of media is needed, as it better handles the techné, which is a crucial starting point of transhumanism. Moreover, its interdisciplinarity can more successfully accomplish this critical role. In fact, aesthetics and its themes such as idea, perception, phenomenon, sensibility, aesthetic illusion, and others are the foundation for continuing work on recognizing, analyzing, and interpreting these issues in Western cultures and the age of media dominance. It might happen that this same era outpaces philosophy of media, posing entirely new challenges and tasks for aesthetics, leaving philosophy of media struggling to advance beyond its beginnings.

Transhumanism poses significant challenges for both aesthetics and philosophy of media. Firstly, in our time, sensuality is largely transformed into digital "value," meaning a form of sensuality that is not directly felt but is mediated by media. This technical mediation, executed not only through technical means, presents a new task for contemporary aesthetics, which responds to it from the perspectives of both media aesthetics and philosophy of media as a subdiscipline. Essentially, this implies that aesthetics, if it wishes to stay relevant, should engage with media. This imperative falls within the purview of philosophy of media, enabling a critical approach to all topics concerning humanity/human species in the aestheticized era of media (applicable to the West and parts of technologically advanced Eastern civilizations, such as China and Japan, for example).

Moreover, at first glance, it may seem that aesthetics has little to do with the digital data exchanged via the internet. However, this mediated sensuality appears to us as a phenomenon entirely reducible to digital facts. Contemporary aesthetics reacts to these facts as subjects of inquiry and potential critique. But to be more productive in this endeavor, aesthetics relies, to some extent, on philosophy of media, which is interdisciplinary and extends its critique to domains such as society,

economy, culture, politics, ethics, ideology, and more. These are all expanded fields of work for aesthetics, through the established "target areas" of philosophy of media.

In all of this, the particularly aesthetic experience gained through media, increasingly mediated by digital media, which partially cyborgizes us and ushers us into the era of transhumanism (where humans and machines become one, a "symbiosis" of the living and non-living), has as one of its consequences not only the "digital dissolution of Privacy" but also the complete loss of control over personal data, which cease to be ours and become the property of private media corporations. The ubiquity of Google, for example, allows these corporations to steal our data, exchange it in the market, and transform us into digital commodities. Thus, we become products of this market, converted into digital data. These digital experiences are primarily media aesthetic experiences, while their expected effects are market-driven.

The contribution of philosophy of media to the critical reaction against the transhumanist project (from digitalization to artificial intelligence and the Internet of Things, as forecasted in the context of the Fourth Industrial Revolution program detailed by the founder and leader of the World Economic Forum - Klaus Schwab) (Schwab 2016) is not only based on general aesthetics and its theoretical and practical experiences but also on tradition, specifically the media ecology established by Marshall McLuhan, expanded by Neil Postman, and many others. Today, media ecology, like philosophy of media, is based on biology, history, linguistics, cybernetics, literature, communication, semantics, network sciences, and other emerging disciplines (Gutiérrez 2020). By dealing with the impacts of media on the environment and vice versa, it inevitably includes the part of our (media) reality associated with wars and the experience of warfare, treating media wars on the same level as so-called real wars in the context of the problematics of total warfare.

As long as wars exist, contemporary mainstream media, which are largely an extension of the military-industrial complex, must be understood and strategically critiqued as globally aestheticized propaganda and deception. This critique is not intended to pacify the media but to highlight their significant role in the destruction of old worlds in exchange for the illusion of new ones. From this, it follows that philosophy of media assumes the risk of radical criticism (from the standpoint of a revolutionary humanism) not only of contemporary media but also of the socio-economic relations that frame the so-called media culture and harness it into contexts of power and current forms of warfare, as indicated in recent NASA documents (Future Strategic Issues/Future Warfare [Circa 2025]), where one of the many strategic goals of war is defined as achieving the practical (media) ideal of "Tele-everything" (Bushnell 2013).

Therefore, philosophy of media, by studying new communication technologies and the media world, not only revives old aesthetic themes by bringing them into direct relation with our time but also goes a step further, towards their critical application in the present reality. Beyond revitalizing aesthetics, it enables the practical applicability of philosophical-media themes in everyday life. This approach does not reduce philosophy of media to mere sophistry but brings contemporary philosophy into a critical relationship with socio-economic and particularly technologically created reality. This is likely one of the reasons why philosophy of media struggles to fit into rigid academic programs and research protocols.

Philosophy of media, intrigued by elucidating the media's role in the production of wars (which are now, as known, aestheticized and spectacularized), as one of its focal research topics, ventures, as previously indicated, beyond the realm of aesthetics, drawing closer to practical knowledge in the fields of politics, ethics, and even history, as leading humanistic disciplines of our time. For

instance, in an article titled "Tomorrow's Wars and the Media," Aleksandr Lovelace draws parallels between the memories of World War II and the contemporary era, particularly in the context of shifting decisive battles from actual battlegrounds to (printed) media, which subsequently applies and mirrors on the battlefield, thereby opening the perspective of total warfare even back then.

To summarize the most significant aspects of the confrontation and comparison between aesthetics and philosophy of media: firstly, both areas of inquiry historically feature their subject matter emerging long before being articulated and named as a separate field of research. In this regard, they also share a similar fate concerning disciplinary recognition – both regarding their own identity (the content and scope of the research field) and their differentiation from other areas of inquiry. The question of "recognition" by the parent discipline – philosophy, as well as its derivative knowledge, was challenging in both cases, generally resulting from the centuries-old dominance of metaphysics and the priority given to the questioning of truth and being (essence) over what is changeable, deceptive, transient, and perishable, referring to sensuality and the phenomenal world. Declarations and beliefs about the end of metaphysics and the orientation towards other perspectives of inquiry that are much more focused on the material world and the sphere of sensuality have allowed both aesthetics and philosophy of media to somewhat establish their status, with aesthetics achieving it fully and philosophy of media only partially, as the need for such knowledge emerged much later. In short, despite the marginalization it suffered in the past, which it now copes with much more successfully, aesthetics is an established discipline, most often seen by philosophy as its intrinsic field of inquiry; interestingly, aesthetics is also partially or independently appropriated by art theory and cultural studies, for example, apart from philosophy. In contrast to aesthetics, philosophy of media still has an uncertain position within the disciplinary division of labor, as it is not certain whether it is sufficiently formulated as a (sub)discipline and in which direction it will generally develop. Superficially, philosophy of media is often classified today as media theories, which is somewhat accurate, with its theorem (observation) being primarily philosophical – both in terms of its origin and methodologically, which significantly distinguishes it in relation to all other theories whose subject matter is media.

Moreover, it could be said that aesthetics and philosophy of media, in a sense, thematically intertwine mutually (both are humanistically oriented); their subjects are sometimes identical and sometimes very similar, with aesthetics having a greater number of divergent fields of interest than philosophy of media and not being solely focused on one research subject, such as media. Therefore, by analogy with the philosophy of art, for example, which emerged within aesthetics and even for a while was considered synonymous with aesthetic inquiries, judging by the nature of its subject matter, philosophy of media is one of the possible branches and directions of aesthetic research in our time.

Despite the diverse interests encompassed by aesthetics, it has nonetheless emerged as a single discipline, incorporating a multitude of subjects, research methods, orientations, and schools of thought. In contrast, philosophy of media focuses on a singular subject of study but is more interdisciplinary in approach compared to aesthetics. This interdisciplinarity serves as a means to transcend sensory and phenomenological boundaries and to comprehensively understand the material world, encompassing economics, social relations, and more. In this regard, if we were to visually represent their respective scopes, aesthetics could be seen as a circular (spiral) movement and field of activity, whereas philosophy of media would radiate and expand in multiple directions from the core of general aesthetic knowledge. The filter between this core and the other fields of knowledge would be technology, through which this multidirectional activity is realized.

Aesthetic knowledge, considering the time of its foundation and the development of the discipline, is much more systematic but also more fragmented compared to philosophical-media knowledge,

which also extends to non-aesthetic domains without merely engaging in speculation. In other words, unlike aesthetics, which has largely relied on metaphysics (ontology) even in its radically critical phases, philosophy of media is far more immersed in materiality. Therefore, it can be said that it is fundamentally materialistic in its basis and orientation. As previously mentioned, it employs aesthetic knowledge starting from techné, and technology always operates on/in some material. Materialism, as the paradigm within which philosophy of media operates, does not preclude speculation but indicates a greater reliance on the material that constitutes its primary subject (media). For this reason, philosophy of media can be seen as closer to applied knowledge than general aesthetics, although it also addresses general ontological themes, as previously demonstrated.

The materialistic foundation of philosophy of media simultaneously determines its future. More precisely, given that it is problem-oriented like any philosophy and more deeply immersed in material reality compared to aesthetics, it follows that philosophy of media is inherently linked to critique and the critical method that questions the so-called reality, regardless of how it is perceived and interpreted. This aspect distinguishes it from other media theories, which often rely more on analytical and empirical methods than on critical approaches to understanding the media world. Despite its fundamentally materialistic conception of the world, philosophy of media, it should be noted, insists on humanism as a value orientation, thereby avoiding the pitfalls of transhumanism.

In conclusion, despite numerous similarities between aesthetics and philosophy of media, it is conceivable that, after an initial phase of mutual influence, they will increasingly diverge. Academic aesthetics is likely to lose interest in media studies, ceding this area to philosophy of media, which is increasingly developing into an independent discipline. This is particularly true as it incorporates a growing body of related and current knowledge, disciplines, and sub-disciplines. However, one thing is clear — without the impetus provided by traditional aesthetic knowledge, philosophy of media in its current form probably would not exist. Furthermore, if it successfully resists transhumanism, philosophy of media will continue to draw its humanistic and epistemological potential from traditional philosophical disciplines, particularly aesthetics, as well as from various other preceding knowledge and inquiries.

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**TURGUT ÖZAL ERA AND NEOLIBERAL ECONOMIC POPULISM:
TRANSFORMATION OF ECONOMIC POLICIES IN TURKEY**

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ABSTRACT

Turgut Özal, is one of the decisive figures in Turkey's modern political and economic history. Serving as the 8th President and 24th Prime Minister of the Republic of Turkey between 1983 and 1989, Özal pioneered profound changes in the country's economic structure. Particularly, he assumed leadership of Turkey during a period associated with neoliberal economic policies that emerged towards the end of the 1980s. The aim of this study is to understand how the economic and political landscape in Turkey transformed during the Özal era and to delineate the framework of this period. Firstly, the amalgamation of Özal's economic policies and populist political strategy will be discussed. In this context, theoretical definitions of the concepts of neoliberal economics and populism will be provided. The concept of populism will be examined as a political strategy. Subsequently, the privatization policies, the strengthening of the market economy, the widespread adoption of openness and free trade, as well as the fiscal policies and deregulation, which constitute the most prominent aspects of populist political strategy, will be debated within the scope of this study. Secondly, an analysis will be conducted on the pillars of the political strategy termed as neoliberal economic populism. As known, Özal did not solely base his economic policies on neoliberal principles; he also endeavored to gain the support of the people by adopting populist political strategies as a leader. Therefore, thirdly, this study will scrutinize how populist demands between Özal and the public were addressed with which economic incentives and supports. Additionally, an analysis will be conducted on who constituted the segment identified by Özal as the people, and within which ideological framework this segment was named. Lastly, an examination will be undertaken from a critical perspective on how much of Özal's neoliberal economic populism is sustainably viable in the realm of real politics.

Keywords: Turgut Özal, Neoliberal Economic Populism, Neoliberal Populism.

USE OF THE TIKTOK APPLICATION AS A LEARNING MEDIA FOR CHRISTIAN RELIGIOUS EDUCATION USING THE STUDENT CENTER LEARNING CONCEPT

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Abstract

With the rapid development of the times and technology, it has an influence on every sector, one of which is the education sector. Learning media and learning concepts must be adjusted to the needs of students in balance with technological advances. The TikTok application is most loved by teenagers, thus it can be utilized by Christian educators in learning CRE for teenagers. This research aims to describe the use of the TikTok application in learning CRE for teenagers with the concept of student-centered learning. The research method used descriptive qualitative research and data collection techniques through observation, and documentation, literature study, data analysis techniques namely data collection, data reduction, and conclusion drawing. The results showed that the TikTok application has features that are favored by teenagers compared to other applications. The use of the TikTok application in adolescent CRE learning with the Student-Centered Learning Concept is feasible to implement. The TikTok application can be used as a learning medium to help students as independent learners and increase involvement in educational CRE learning both in schools, churches, and the wider community.

Keywords: TikTok App; SCL concepts; Utilisation; Christian Religious Education; teenagers.

Introduction

Learning in the 21st century involves a shift from teacher-centered approaches to student-centered ones in curriculum design and learning patterns. The concept of student-centered learning (SCL) provides opportunities and facilities for students to construct their own knowledge with the hope of deeply understanding what they learn and ultimately achieving holistic quality as learners.¹ Based on that concept, teachers as instructors or facilitators are challenged to leverage technological advancements. Its utilization is certainly difficult for educators to be more imaginative and creative

¹ I Ketut Muliarta, "Menerjemahkan Perubahan Dari TCL (Teacher Center Learning) Ke SCL (Student Center Learning)," *Cetta: Jurnal Ilmu Pendidikan* 1, no. 2 (2018): 76–86.

in creating technology-based learning media. The learning media used should be in line with technological advancements. Students should also be able to use learning media easily and at low cost. TikTok is the simplest and cheapest application to obtain. In a previous study, TikTok application can be utilized as a learning media for the Indonesian language, due to its diverse features. TikTok as a learning media can be accessed anytime and anywhere because it can be applied on Android or IOS-based smartphones.² The use of the TikTok application provides its own benefits for users, such as honing creativity in video editing skills, and making the learning process more engaging and interactive.³ Sholihatul and Luluk in their research explain that the TikTok application can be utilized for preaching and discussions about religion.⁴

TikTok is a social media application that dominates and is widely used among teenagers. This application has become a trend of the current generation, and the majority of TikTok users in Indonesia itself are millennials, school-age children, or commonly known as Generation Z.⁵ The impact of using the TikTok application is not only positive but also negative. One of the negative impacts is imitation or replication in movements, dances, narratives, and so on, and the frequency of imitation is said to be moderate. Thus, today's teenagers whose lives are filled and closely intertwined with digital media can be utilized by educators by leveraging this moment in the learning process. This means that the TikTok application can be effectively utilized with proper monitoring by teachers as facilitators to have a positive impact.⁶

Based on the description above, the TikTok application can also be utilized by Christian educators in teaching Christian religious education, especially for teenagers. Therefore, the purpose of this research is to describe the utilization of the TikTok application in the process of teaching Christian religious education (CRE) for teenagers with the concept of Student Centered Learning (SCL). The research method used is qualitative descriptive analysis. The initial steps involve observing and studying the TikTok application, noting and utilizing its features. Subsequently, the observations and feature usage will be documented. The final step is to conduct relevant literature studies to compare findings with existing research and to identify new insights regarding the utilization of TikTok in teaching Christian religious education for teenagers.

TikTok Application: History, Benefits, and Uses

TikTok is an application launched in 2014 by China, with its main advantage being its features such as sound recording, video recording, adding background music, etc. This application is very popular among various groups both domestically and internationally. Starting from users being able to create videos with durations ranging from 15 to 60 seconds, now the duration can be extended to 3 minutes and 10 seconds with accompanying music, filters, and many other creative features. It can also be used for live streaming.⁷ Starting from a company from China, ByteDance, launching an application initially named Douyin with short durations. Within a year, Douyin had gained 100 million users and 1 billion video views every day. The increasing popularity prompted Douyin to expand outside China

² A Dewanta, "Pemanfaatan Aplikasi Tik Tok Sebagai Media Pembelajaran Bahasa Indonesia," *Jurnal pendidikan dan Pembelajaran Bahasa* 9, no. 2 (2020): 79–85.

³ Ibid.

⁴ Sholihatul atik Hikmawati and Luluk Farida, "Pemanfaatan Media Tik Tok Sebagai Media Dakwah Bagi Dosen Iai Sunan Kalijogo Malang," *Al-Ittishol : Jurnal Komunikasi dan Penyiaran Islam* 2, no. 1 (2021): 1–11.

⁵ Dewanta, "Pemanfaatan Aplikasi Tik Tok Sebagai Media Pembelajaran Bahasa Indonesia."

⁶ Esti Astuti and Susi Andriani, "Intensitas Penggunaan Aplikasi TikTok Terhadap Perilaku Imitasi Remaja," *Komunikologi: Jurnal Ilmiah Ilmu Komunikasi* 18, no. 02 (2021).

⁷ Novriadi and Fitria, "Use of the TikTok App as a Learning Tool for Elementary Science: The Effect of Style on Objects."

and rename the application TikTok.⁸ Its founder is named Zhang Yiming, a native Chinese who graduated from Nankai University in China as a software engineer.

The biggest enthusiasts are Generation Z, especially teenagers, and this has even become a new culture in social life. As a platform for existence, the pursuit of popularity is what can drive many teenagers to obtain a high number of video views, as the number of video views is certainly a standard for popularity within the TikTok community.⁹ The content presented on TikTok includes entertainment content, educational content, cooking content, haul content, tutorial content, and even nowadays, content for promoting products is also available. One of the educational contents is about writing final assignments or theses; many content creators present how to write a thesis. TikTok is utilized as a learning medium aimed at providing equal access and opportunities for everyone to learn and share inspiration with the community through educational content.¹⁰

In creating content, sources of ideas are needed, and TikTok provides many sources of ideas that can stimulate the mind to generate or produce its own creations.¹¹ Mulyana writes that there are two factors in the use of TikTok, namely internal and external factors. Internal factors are related to feelings, attitudes, and individual characteristics, prejudices, desires, or expectations, focus, learning processes, physical condition, values and needs, as well as interests and motivations. Meanwhile, external factors relate to family background, acquired information, knowledge and surrounding needs, intensity, the scale of new and familiar things.¹²

The TikTok application can provide negative benefits to its users if there are still negative content appearing on the TikTok platform. However, it provides positive impacts on users in terms of friendships, entertainment, and popularity among users.

The concept of Student Centered Learning in Christian Religious Education

Christian Religious Education is a systematic and methodical interaction to bring students to a phase of self-confidence development that encourages similarity with Christ. The circumstances in the undeniable vibrant era, fully supported by science and innovation as well as acceptance from foreign countries, increasingly fill the horizon of the adolescent world. This era is a time where the level of socialization and tolerance towards technological advancements, both domestically and internationally, is very high. In this situation, CRE educators must not be complacent and must continue to learn, in order to compete in the computerized era, and continue to hone their skills and authenticity in demonstrating their field, especially in educating teenagers in schools, churches, and other worship gatherings.¹³

Teenagers are students, like arrows that need to be directed and released from their bow, and this is certainly not an easy task. Many people refer to this age as a unique one because, on one hand, biological development, character, mindset, and temperament are unique in relation to young people, so educators and instructors of teenage Christian religious education (CRE) must have a spirit of love, appreciation, and tolerance for what they need to bring them to experience the presence and lead them

⁸ Ibid.

⁹ Putri Naning Rahmana, Dhea Amalia Putri N, and Rian Damariswara, "Pemanfaatan Aplikasi Tiktok Sebagai Media Edukasi Di Era Generasi Z," *Akademika* 11, no. 02 (2022): 401–410.

¹⁰ Ibid.

¹¹ Nuning Indah Pratiwi and Achmad Husen, "Analisis Penggunaan Aplikasi Tik Tok Pada Remaja Di Denpasar Saat Pandemi," *The Source: Jurnal Ilmu Komunikasi* 3, no. 1 (2021): 42–51.

¹² Ibid.

¹³ Yosefo Gule, "Pentingnya Kompetensi Sosial Guru Pendidikan Agama Kristen Dalam Meningkatkan Motivasi Siswa Belajar Pendidikan Agama Kristen," *Jurnal Abdiel: Khazanah Pemikiran Teologi, Pendidikan Agama Kristen dan Musik Gereja* 5, no. 1 (2021): 89–104.

to the divine light.¹⁴ Christian Religious Education teaches students to know Jesus Christ with a true faith foundation based on the Bible, whether it's knowledge, attitude, or skills. Therefore, the implementation process of CRE is carried out using various effective and efficient teaching strategies or methods. Thus, the Student Centered Learning (SCL) approach in the teaching and learning process of CRE positions students as active listeners, which means students must be more creative and innovative in practicing the teachings of the Christian faith through CRE learning both inside and outside the classroom.¹⁵ The concept of student-centered learning (SCL), which is better known as SCL, is an approach to learning that stems from constructivist thinking. Although student-centered learning (SCL) has been around for a long time, its implementation in teaching and learning activities has gradually evolved. In Indonesia, student-centered learning (SCL) is still a popular topic today, especially among face-to-face learning environments, marked by the emergence and popularity of discussions, lectures, and training on SCL. Thinkers like John Dewey, Jean Piaget, and Vygotsky, whose work focused on how students learn, are responsible for the shift in the learning approach from teacher-centered to student-centered, namely student-centered learning (SCL). SCL means placing students at the center of learning activities. This conceptual shift is further supported by research on how the human brain works, which suggests that students learn better through direct experience and controlling the learning process.

In the CRE learning process that uses the SCL model, there is a combination of lecture and conversation strategies, emphasizing that CRE learning is not completed in one meeting. In SCL-based CRE learning, CRE educators have specific obligations, particularly: to act as facilitators in the CRE learning experience, to survey the abilities of CRE learning subjects dominated by substitute actors to complete illustrations, and to assist substitute actors in obtaining and using data to address issues in CRE learning.¹⁶ In the implementation of the SCL approach to CRE learning, there are several stages centered on students in the classroom, including observation where students will observe images and texts, then the stage of asking questions created by students themselves based on the observation results. These questions are in line with competency achievement indicators, group divisions are made for discussions to collaborate in solving problems. The next stage is to analyze the data and create a report, after which the students communicate by presenting the analysis results to provide feedback. If CRE learning in schools still revolves around the teacher, it will affect the students' learning interest, and there tends to be a lack of motivation for CRE learning among teenage students.¹⁷

There are several types of learning in the Student Centered Learning pattern as follows¹⁸:

- 1) Small Group Discussion (SGD) is a discussion method to analyze, criticize, and debate issues and life problems.
- 2) Role Play and Simulation is a symbolic representation by two students who have previously studied the materials to be portrayed.
- 3) Discovery Learning is active student involvement in finding answers through research methods without the participation of the teacher.
- 4) Self Directed Learning is an activity carried out by students to understand or acquire knowledge through summary tasks or creating reading reports.

¹⁴ Kurniawan Johanes, *PAK Remaja* (Ekumene, 2021). 2-3.

¹⁵ Fredik Boiliu, "Pendekatan Student Centered Learning Dalam Pendidikan Agama Kristen Untuk Meningkatkan Motivasi Belajar Siswa: SCL, Pendidikan Agama Kristen," *MAWAR SARON: Jurnal Pendidikan Kristen dan Gereja* 6, no. 1 (2023): 30-43.

¹⁶ Ibid.

¹⁷ Fredik Melkias Boiliu and Solmeriana Sinaga, "Pembelajaran Pendidikan Agama Kristen Berbasis Student Centered Learning Di Sekolah," *Jurnal Education and Development* 9, no. 2 (2021): 120-126.

¹⁸ Cecep Sobar Rochmat, Rosendah Dwi Maulaya, and Annisa Avilya, "The Concept And Role Of The Student Centered Learning Model In Adolescent Akhlaq Education," *At-Ta'dib* 17, no. 2 (2022): 232-253.

- 5) Cooperative Learning is cooperative learning with an inquiry method that requires cooperation between individuals and their scope in or out of the classroom.
- 6) Contextual Learning (CL) Learning with this method begins with questions related to students' real-world lives (daily life modeling). The aim is to measure the extent to which students apply previous materials. This will benefit both students and teachers, where the benefits include making students' thinking concrete, motivating learning, and creating a comfortable and enjoyable learning atmosphere.
- 7) Problem Based Learning (PBL) is an exercise for students to describe real-life problems and find solutions. This learning model will develop students' high-level thinking skills because it is related to the analysis and correct problem-solving. The implementation of this technique requires a quiet and pleasant environment with the aim of training ideal reasoning.
- 8) Collaborative Learning (CbL) Learning with the CBL model emphasizes students to search for and discover as many answers as possible. After finding many sources, the next step is to interact with peers to explore as many possibilities as possible from the answers to a teacher's assignment.
- 9) Project Based Learning (PBL) is the completion of project tasks designed by the teacher to be completed by students based on the teacher's guidance.

Based on the description above, it can be concluded that in teenage Christian religious education (CRE) learning, the concept of SCL is highly suitable for the needs of teenagers who are in a developmental phase. Adolescence is a transitional period and a time for questioning, and by providing opportunities for teenagers to explore themselves through self-directed learning, they can actively develop the knowledge and skills learned in CRE. In this concept, multimedia can be used, with emphasis on both hard skills and soft skills according to the needs of teenagers.¹⁹

The implementation of Student Centered Learning-based learning utilizing the TikTok application in Christian Religious Education

With today's teenage life being heavily influenced by the need for social media, particularly among millennials who predominantly use the TikTok application, this situation presents a moment that can be seized by Christian instructors or educators to guide teenagers in Christian education. Both formal and non-formal Christian educators can leverage the TikTok application in the learning process. Following the concept of SCL, where educators act as facilitators and students play a crucial role in acquiring knowledge, TikTok can be utilized to enhance learning experiences. Regarding the understanding, content, and utilization of the TikTok application, teenage Christian religious education, and the concept of SCL-based learning, here are some aspects that can be implemented in Christian religious education:

- a. The TikTok application as an interactive learning media in teenage Christian religious education (CRE) at schools. In the process of student-centered learning in CRE, during the implementation stage, teachers apply student-centered learning through the SCL approach via specific learning steps, especially in core learning activities. The main activities in the SCL approach, such as observing, questioning, trying, associating, and communicating, are carried out within the allocated time in the Lesson Plan.²⁰ In these core activities, teachers can use the TikTok application as a learning media. Teachers provide short instructional video content related to the lesson material. The videos, previously created using features provided by the teacher, facilitate the learning process in these core activities. Different types of learning approaches under SCL can be utilized, one of which is the small group discussion (SGD) method. Through this method, students can discuss the content of the

¹⁹ Muliarta, "Menerjemahkan Perubahan Dari TCL (Teacher Center Learning) Ke SCL (Student Center Learning)."

²⁰ Boiliu and Sinaga, "Pembelajaran Pendidikan Agama Kristen Berbasis Student Centered Learning Di Sekolah."

watched videos to analyze, critique, and debate with their group members, making the learning activities more interactive.

b. TikTok application as a learning media in online learnin

Learning media serve as tools to enhance the interaction between teachers and students, as well as the interaction of students with their environment. TikTok application is closely associated with teenage life. Providing brief instructional materials through TikTok can have positive effects on learners, as they tend to be more motivated to learn. Teachers can direct students to review the materials taught at school using TikTok as a learning media. Students can then report back their learning progress when they return to school. This provides an opportunity for educators to interact directly with students through TikTok outside the school environment in an online setting.²¹

c. TikTok application helps students as independent learners

One of the internal factors mentioned earlier is perception, which involves the learning process. TikTok plays a significant role in someone's learning process. With the rapid advancement of technology, the current human needs have shifted towards social media.²² In line with the SCL concept, students are considered independent learners, and as independent learners, they are assisted in acquiring knowledge autonomously. With Project-Based Learning (PBL) in the SCL approach, teachers can utilize the TikTok application. Students, as independent learners, are assigned field tasks to complete projects.

d. Utilizing the TikTok application to enhance teenage engagement in teenage Christian religious education (CRE) in church and educational community environments.

The TikTok application can be utilized to disseminate educational content to other users. As learners, millennial teenagers also want to share the knowledge they acquire from their educational institutions with the broader community. In relation to Christian religious education, the availability of the TikTok application facilitates them in utilizing the platform to disseminate the materials they have learned and studied, making it beneficial for others as well.

Conclusion

After discussing and analyzing the data obtained from the research conducted on the utilization of the TikTok application in teenage Christian religious education (CRE) with the concept of student-centered learning, it can be concluded that the TikTok application can be utilized as a suitable learning media. By understanding the objectives of teenage Christian religious education and the concept of SCL, the TikTok application can meet the learning needs of students.

The TikTok application attracts students due to its uniqueness and numerous features that can be integrated into learning. Today's teenagers, who are closely connected to technological advancements, tend to use the TikTok application more because of its short content duration, which does not cause boredom among students. As facilitators, teachers must be able to compete and equip themselves to keep up with the current trends in technology and societal advancements.

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WEB APPLICATION SECURITY: DETECTION AND MITIGATION OF VULNERABILITIES

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Abstract

Web applications play a crucial role in today's digital landscape, facilitating various online activities from e-commerce to social networking. However, they also present significant security challenges, as they are susceptible to a wide range of vulnerabilities that can be exploited by malicious actors. In today's digital age, web applications are critical for companies and organizations. Unfortunately, their widespread use also makes them attractive targets for attackers who exploit web application vulnerabilities. This article delves into the OWASP Top 10, a popular guide to common web application vulnerabilities, and provides a detailed analysis of major ones, including broken access control, cryptographic errors, injection (SQL Injection, XSS, Code Injection), insecure design, and security misconfiguration. Our in-depth examination from both the software development and attacker perspectives covers the causes, risks, and measures to mitigate the impact of these vulnerabilities. With the use of real-world examples and case studies, we emphasize the importance of understanding web application vulnerabilities and creating effective solutions to address them. By presenting the attacker's point of view, we contribute to the existing knowledge, new ideas, and practices to enhance web application security. This paper provides valuable insights for organizations and software developers seeking to improve the security of their web services with technical expertise and practical solutions. Also, it provides an overview of web application security, focusing on the detection and mitigation of vulnerabilities.

Keywords: Web Application Security, OWASP Top 10, SQL Injection, Cross-Site Scripting, Insecure Design

Özet

Web uygulamaları, e-ticaretten sosyal ağlara kadar çeşitli çevrimiçi etkinlikleri kolaylaştırarak bugünün dijital peyzajında kritik bir rol oynamaktadır. Ancak, bunlar aynı zamanda kötü niyetli aktörler tarafından sömürülebilecek geniş bir yelpazede savunmasızlık gösterdiği için önemli güvenlik zorlukları da sunmaktadır. Günümüz dijital çağında, web uygulamaları şirketler ve kuruluşlar için hayati önem taşımaktadır. Ne yazık ki, yaygın kullanımları onları web uygulama açıklarını sömüren saldırganlar için cazip hedefler haline getirmektedir. Bu makale, ortak web uygulama açıklarının popüler bir rehberi olan OWASP Top 10'a detaylı bir analiz sunmakta ve kırık erişim kontrolü, şifreleme hataları, enjeksiyon (SQL Enjeksiyonu, XSS, Kod Enjeksiyonu), güvensiz tasarım ve güvenlik yan yapılandırma gibi başlıca açıkları içermektedir. Yazılım geliştirme ve saldırgan perspektiflerinden derinlemesine bir inceleme, bu açıkların nedenlerini, risklerini ve etkilerini azaltma önlemlerini ele almaktadır. Gerçek dünya örnekleri ve vaka

çalışmalarının kullanımıyla, web uygulama açıklarını anlamının ve bunlarla başa çıkmak için etkili çözümler oluşturmanın önemini vurgularız. Saldırmanın bakış açısını sunarak, mevcut bilgiye, yeni fikirlere ve uygulamalara web uygulama güvenliğini artırmaya katkıda bulunuruz. Bu makale, teknik uzmanlık ve pratik çözümlerle web hizmetlerinin güvenliğini artırmak isteyen kuruluşlar ve yazılım geliştiricileri için değerli içgörüler sunmaktadır. Ayrıca, web uygulama güvenliğinin tespiti ve azaltılmasına odaklanarak bir genel bakış sunmaktadır.

Anahtar Kelimeler: Web Uygulama Güvenliği, OWASP Top 10, SQL Enjeksiyonu, Cross-Site Scripting, Insecure Design

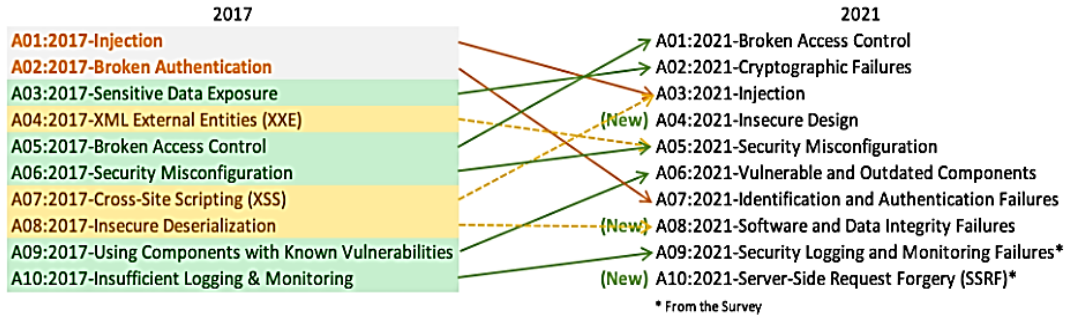
1. Giriş

Günümüzde sosyal ağ yazılımları başta olmak üzere iş yazılımları, e-ticaret ve benzer birçok yazılım web teknolojileri kullanılarak geliştirilmektedir. Web uygulamaları ister intranet ister internet ortamında olsun erişilebilen her noktadan saldırıya uğrayabilirler. Bunun sonucu olarak her geçen gün sistemlere zarar vermek isteyen veya kullanıcı bilgilerini çalarak çeşitli kazanımlar elde etmek isteyen saldırganlar ve siber suç sayıları yazılım uygulama sayıları ile daha hızlı bir şekilde artmaktadır. Bununla birlikte web teknolojileri kullanılarak yapılan ticari faaliyetlerin büyüklüğü de düşünüldüğünde web uygulama güvenliği, uygulamalarının kendisinden daha önemli hale gelmektedir [1]. Web uygulamalarının güvenliği, sadece saldırganlardan korunmak için değil, aynı zamanda kullanıcıların güvenini kazanmak ve iş sürekliliğini sağlamak için de hayati önem taşımaktadır. Bu nedenle, web uygulamalarının güvenliği ve çözüm önerileri bazında kurumların çalışması gerekmektedir. Web uygulama güvenliği konusunda önem veren kurumlar kullanıcıların kişisel bilgilerini korur, işletmenin itibarını güvence altına alır ve hizmetlerin kesintisiz bir şekilde sunulmasını sağlamaktadır. OWASP (Open Web Application Security Project), web uygulama açıklıkları için alınabilecek önlem ve iyileştirmeler konusunda rehberlik hizmeti veren test kılavuzudur. Uygulama güvenliği konusunda yazılım araçları ve bilgi tabanlı belgeler sunmaktadır[2-3]. Bu makalede, en son yayınlanan 2021 OWASP Top 10 listesinde yer alan zafiyetler ayrıntılı olarak incelenecektir[4]. Her bir zafiyet için, nasıl ortaya çıktığı, hangi etkilere sahip olabileceğini ve bu zafiyetleri önlemek için hangi adımların alınabileceği konularına değinilecektir.

2. Web Uygulama Güvenliği Zafiyetleri

Web uygulamalarının güvenliği konusunda birçok kaynak ve rehber bulunmaktadır. Bu rehberler arasında OWASP (Open Web Application Security Project) tarafından yayınlanan OWASP Top 10 Web Uygulama Güvenlik Riskleri raporu önemli bir yer tutmaktadır. OWASP Top 10 raporu, en yaygın web uygulama güvenlik açıklıklarını ele almaktadır. Bu rapor, geliştiricilere ve güvenlik uzmanlarına, web uygulamalarının güvenliği konusunda rehberlik etmektedir. Web uygulamalarını tehdit eden birçok farklı güvenlik açığı türü bulunmaktadır.

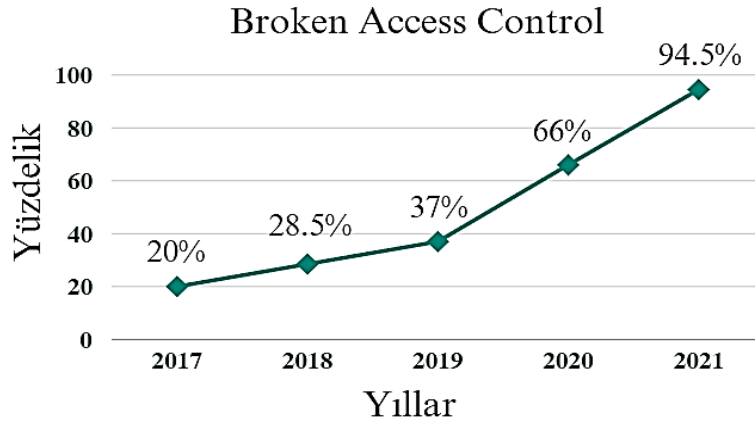
En önemli 10 web güvenlik açıklıkları şunlardır:



Şekil 1. OWASP Top 10 [5]

2.1 Broken Access Control (Kırık Erişim Kontrolü)

Erişim kontrolü zafiyetleri, web uygulamalarındaki en yaygın güvenlik açıklarından biridir. Bu zafiyetler, birçok veri ihlali olayının ana sebebidir ve gizlilik endişeleri ile gelir kaybına yol açmaktadır. Web uygulamalarında erişim kontrolü zafiyetlerini önceden tespit etmek ve önlemek zordur. Bu sorunu proaktif olarak çözmek, geliştiricilerin güvenlik farkındalığına ve uzmanlığına ihtiyaç duyar, bu da sistematik çözümler gerektirir [6]. OWASP 2021'e göre, son üç yılda kırık erişim kontrolüne yol açan güvenlik açıklıkları beşinci sıradan birinci sıraya yükselmiştir. Web uygulamalarının %94,5'i, kullanıcıların kendi yetki sınırları dışında hareket etmelerine izin vererek yetkisiz açıklama, bozulma, kesinti veya veri yok oluşuna neden olan güvenlik zayıflıkları tespit edilmiştir. Kırık kimlik doğrulama ve yetkisiz erişim gibi bu tür zayıflıklar, 318.000'den fazla web uygulamasında rapor edilmiştir. Kırık erişim kontrolüne bağlı zafiyetlerin her yıl yüzdesi artmaktadır. Şekil 2'de gösterildiği gibi. Bu zafiyet, yazılım geliştirme yaşam döngüsü sırasında yetersiz tasarım, erişim kontrolü ve uygulamaların güvenlik tarafının göz ardı edilmesi nedeniyle web uygulamalarında artışa geçmektedir.



Şekil 2. Kırık Erişim Kontrolü [7]

Broken Access Control zafiyeti önleme yöntemleri:

- Yetki denetimi ilkeleri uygulanması gerekmektedir.
- Güçlü kimlik doğrulama ve yetki mekanizmaları kullanılması gerekmektedir.
- Güvenli kodlama uygulamaları yapılması gerekmektedir. (Doğru yetkilendirme kontrolleri, kullanıcı girdilerini doğrulama)

2.2 Cryptographic Failures (Kriptografik Hatalar)

OWASP-2021 raporuna göre, kriptografik hatalar web uygulamalarının karşılaştığı en önemli güvenlik zayıflıkları arasında yer almaktadır. Kriptografik hatalar, genellikle yanlış uygulanan veya eksik kalan kriptografik yöntemlerden kaynaklanır. Bu durum, web uygulamalarının hassas verilerini koruma yeteneğini ciddi şekilde etkileyebilir ve kullanıcıların verilerinin kötü niyetli saldırganlar tarafından ele geçirilme riskini artırabilir. Özellikle, kriptografik anahtar yönetimi ve şifreleme protokollerindeki eksiklikler, kriptografik hataların başlıca nedenleri arasında yer alır. Bu tür eksiklikler, saldırganların şifrelenmiş veriyi çözerek hassas bilgilere erişmesine olanak tanır. Kriptografik hataların ortaya çıkmasında yazılım geliştirme sürecinde yapılan hatalar da etkilidir. Örneğin, uygun kriptografik algoritmaların seçilmemesi veya kriptografik işlemlerin doğru şekilde uygulanmaması gibi hatalar, web uygulamalarının güvenlik zayıflıklarını artırmaktadır.

Kriptografik hatalar, genellikle aşağıdaki durumları içerir[5-7]:

- Eski veya zayıf kriptografik algoritmaların veya protokollerin kullanılması.
- Varsayılan kriptografik anahtarlarının kullanılması, zayıf kriptografik anahtarlarının oluşturulması veya yeniden kullanılması veya uygun anahtar yönetiminin veya dönüşümünün eksik olması.
- Kriptografik anahtarlarının kaynak kodu depolarına eklenmesi.
- Şifrelemenin zorunlu olmaması, örneğin herhangi bir HTTP başlığının (tarayıcı) güvenlik yönergelerinin veya başlıklarının eksik olması.

2.2.1 Örnek Kriptografik Hata Senaryosu

Bir banka, müşterilerinin hesaplarını güvende tutmak için bir web uygulaması geliştirmiştir. Ancak, uygulama geliştiricileri, kullanıcıların parolalarını depolamak için güvenli olmayan bir şifreleme algoritması olan MD5'i kullanmışlardır. Bu nedenle, kullanıcıların hesapları güvenlik riski altındadır. Saldırganlar, bankanın web uygulamasına sızmayı başarır ve kullanıcıların parola veri tabanını ele geçirirler. Parolalar, MD5 algoritması ile güvenli olmayan bir şekilde depolandığı için, saldırganlar parolaları hızla çözebilir ve kullanıcıların hesaplarına ulaşabilirler. Bu durumda, müşterilerin kişisel ve mali bilgileri tehlikeye girmiştir.

2.2.2 Kriptografik Hata İçeren Örnek Kod Parçası ve Çözüm Önerisi

Şekil 3'te belirtilen kod parçasında, kullanıcıların şifrelerini depolamak için MD5 algoritması kullanılmıştır. Ancak MD5, günümüzde güvenli bir şekilde kullanılmayan bir algoritmadır. Bu nedenle, bu kod parçası güvenli olmayan bir şekilde parolaları depolar ve bu da kriptografik hatalara yol açabilmektedir. MD5 yerine daha güçlü bir şifreleme algoritması kullanılmalıdır.

```
1 import hashlib
2
3 def hash_password(password):
4     hashed_password = hashlib.md5(password.encode()).hexdigest()
5     return hashed_password
6
7 def check_password(input_password, hashed_password):
8     return hashlib.md5(input_password.encode()).hexdigest() == hashed_password
9
10 password = input("Lütfen parolanızı girin: ")
11 hashed_password = hash_password(password)
12 input_password = input("Lütfen parolanızı girin: ")
13 if check_password(input_password, hashed_password):
14     print("Giriş başarılı.")
15 else:
16     print("Hatalı parola.")
```

Şekil 3. Zayıf Kod

Şekil 4'te belirtilen kodlar parolaları SHA-256 algoritmasıyla güvenli bir şekilde depolamaktadır. Ayrıca, her kullanıcı için rastgele bir tuz (salt) oluşturarak daha yüksek bir güvenlik sağlanmaktadır.

```
1 import hashlib
2 import secrets
3 def hash_password(password):
4     salt = secrets.token_hex(16) # Rastgele bir tuz oluştur
5     hashed_password = hashlib.sha256((password + salt).encode()).hexdigest()
6     return hashed_password, salt
7 def check_password(input_password, hashed_password, salt):
8     return hashlib.sha256((input_password + salt).encode()).hexdigest() == hashed_password
9 password = input("Lütfen parolanızı girin: ")
10 hashed_password, salt = hash_password(password)
11 input_password = input("Lütfen parolanızı girin: ")
12 if check_password(input_password, hashed_password, salt):
13     print("Giriş başarılı.")
14 else:
15     print("Hatalı parola.")
```

Şekil 4. Kriptografik Güvenlik Zayıflığına Çözüm Önerisi: Daha Güçlü Şifreleme Algoritması

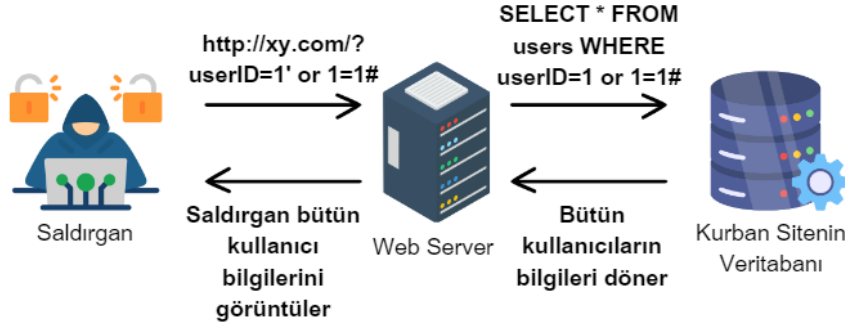
2.3 Injection (Enjeksiyon)

Kod enjeksiyonu, savunmasız bir uygulamaya kötü amaçlı kod enjekte etmekten oluşan bir saldırıdır. Kod yerleştirme saldırılarının ana türleri şunlardır:

2.3.1 SQL Injection (SQL Enjeksiyonu)

Veri tabanı sorgusunu değiştirerek yanıltıcı veri sağlama veya veri tabanı girişlerini değiştirme amacıyla kullanılan bir saldırı türüdür. SQL enjeksiyon zararlı olmayan SQL cümleciklerinin arasına zararlı kelimeler yerleştirilerek sistemi manipüle etme işlemidir. Bu yöntem çok basit bir saldırı yöntemi olmasına rağmen yıllardır popülaritesini hiç yitirmemiştir. SQL enjeksiyon ile kullanıcı adı ve şifre bilgisine ihtiyaç duymadan sisteme girebilmek mümkündür. Web uygulamaları ara yüz geçişleri esnasında sorgulama dilini kullanır ve geliştiricisinin tasarımına bağlı olarak

kullanıcıya farklı şekillerde sunulur. SQL enjeksiyon işlemi tam da bu esnada gerçekleştirilmektedir. Saldırgan tarafından uygulamada kullanılan kullanıcı giriş alanlarına ya da tarayıcı adres çubuğuna kötücül cümleciklerin eklenmesiyle meydana gelmektedir. Saldırgan elde ettiği bilgiler ışığında farklı senaryolar üreterek veri tabanındaki verilerin bir kısmı ya da tamamına ulaşabilir. Yönetici şifresini ele geçirerek veri tabanını silebilir, sistemi kapatabilir, ya da elde ettiği verileri kullanarak çeşitli sitelerde verileri ücret karşılığında ilgililerin kullanımına açık hale getirebilir [8].



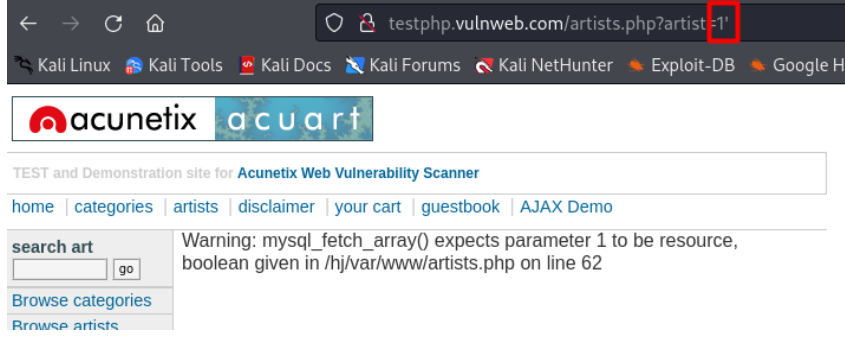
Şekil 5. SQL Injection Çalışma Mantığı

Şekil 5’te görüldüğü gibi saldırganın veri tabanına giden SQL kodunu manipüle etmesi ve sorgusunu çalıştırmasıyla birlikte veri tabanı bilgilerini ele geçirmesi veya çeşitli sorgu manipülasyonları ile zararlı kod enjekte etmesiyle sonuçlanmaktadır. SQL Injection tespiti yapılırken bir referans noktası seçilmesi gerekmektedir. Sorgu manipülasyonları sonucunda web uygulamasının verdiği sonuçlar değerlendirilerek SQL Injection zafiyeti bulunduğu kanıtlanmaktadır.

2.3.2 Örnek SQL Injection Zafiyeti Tespiti

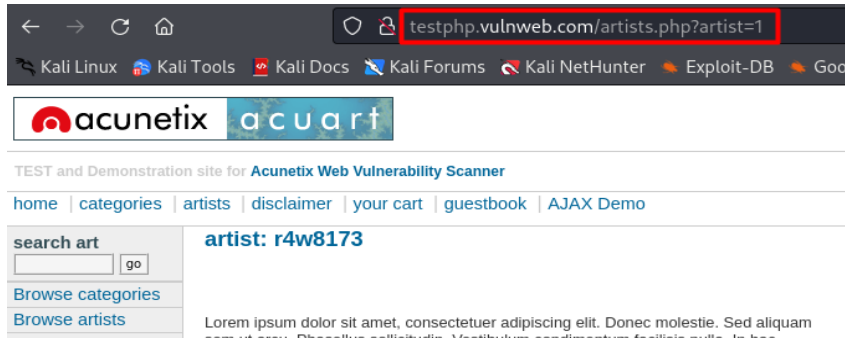
Aşağıdaki ifadeler, bir web uygulamasının URL’indeki parametreleri manipüle etme girişimlerindedir. Örneğin, artist=4’ ifadesi, bir SQL sorgusunu bozabilir ve hata mesajı döndürebilmektedir. Bu hata mesajı, SQL Injection olduğunu kanıtlayabilmektedir. <http://testphp.vulnweb.com/artists.php?artist=1> URL’sine sahip bir web uygulamasını inceleyeceğiz. Bu web uygulaması, Acunetix tarafından oluşturulan ve bilinçli olarak web saldırılarına karşı savunmasız bırakılan bir test sitesidir. <http://testphp.vulnweb.com/artists.php?artist=1> adresinin “?artist=1” kısmında artist bir parametredir. 1’ tırnak işareti kullanılan kısım payload olarak tanımlanmaktadır.

-artist=4’
-artist=4”
-artist=5-1



Şekil 6. VulnWeb Parametre Denemesi

/artist.php?artist=1 yolu ile siteye gittiğimizde artist: r4w8173 ile karşılaşılacaktır.



Şekil 7. VulnWeb ID Parametresi Denemesi

/artist.php?artist='2'-1' yolu ile siteye gittiğimizde yine aynı sayfa ile karşılaşırız, ilgili '2'-1' payloadı girildiğinde çalışan SQL kodları şu şekildedir:

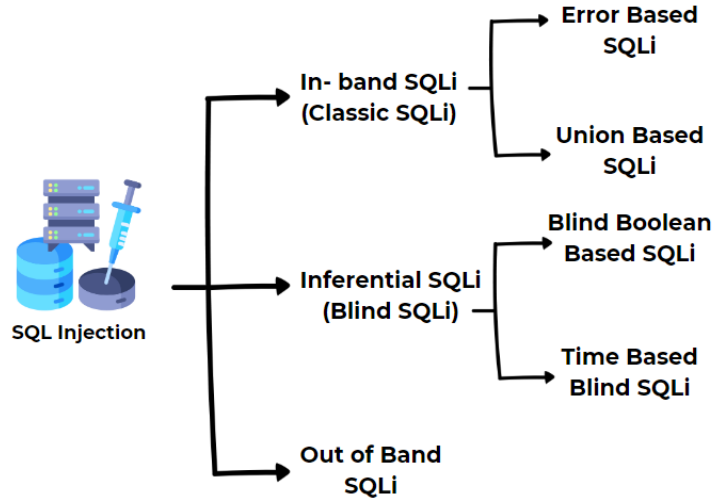
```
SELECT * FROM artists WHERE artist_id = '2'-1'
```

SQL sorgusunun sonucu ile;

```
SELECT * FROM artists WHERE artist_id = 1
```

Sorgusunun sonucu aynıdır. Aynı sorgunun çalıştığı referans noktası kapsamında belirlendiğinde SQL kodunun manipüle edildiği kanısına varılmaktadır. Bu tarz değerlendirmeler ile SQL Injection zafiyeti olduğu anlaşılmaktadır. SQL Injection zafiyetinin farklı türleri bulunmaktadır.

2.3.3 SQL Injection Zafiyeti Türleri



Şekil 8. SQL Injection Zafiyeti Türleri

2.3.3.1 Error Based SQLi

Error Based SQLi, saldırı türünde, saldırgan kötü niyetli SQL ifadelerini web uygulamasının giriş alanlarına veya URL'lerine enjekte etmektedir. Bu kötü niyetli SQL ifadeleri, veri tabanı sistemlerinde hatalar üreterek, sistemi daha fazla sömürebilecek bilgileri ortaya çıkarmaktadır. Hata mesajları içerisini manipüle edebilecek fonksiyonlar kullanılmaktadır. Seçeceğimiz fonksiyonlar DBMS (Veri tabanı Yönetim Sistemi) türüne göre değişiklik göstermektedir. Örneğin, VulnWeb web uygulamasında MySQL veri tabanı kullanılmaktadır. Bu veri tabanında, *extractvalue()* fonksiyonu kullanılarak hata alınabilmekte ve bu hata ile birlikte istenilen fonksiyonun çalıştırılması sağlanabilmektedir. MySQL fonksiyonlarından *extractvalue()*, normalde XML verilerinde belirtilen XPath ifadesine göre bir değer döndürmek için kullanılmaktadır. Belirli bir ögenin veya özniteliğin değerini çıkarmak için XML dizilerinde kullanılmaktadır.

Örnek Genel Kullanımı:

EXTRACTVALUE(xml_dize, xpath_ifadesi)

xml_dize: XML verisinin içerildiği bir sütun, XML dizesi veya XML verisini içeren bir ifadedir.

xpath_ifadesi: XML verisinden çıkarmak istediğiniz değeri belirten bir XPath ifadesidir.

Örnek XML verisi ve Değer Alma SQL Kodu Örneği:

XML Verisi:

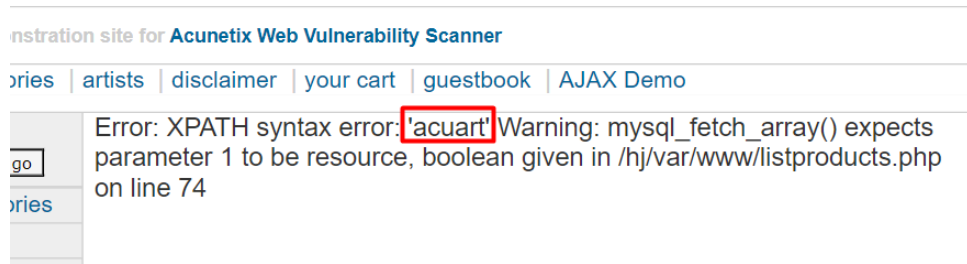
```
<kitaplar>
  <kitap>
    <baslik>MySQL Yönetimi</baslik>
    <yazar>Emre DOĞAN</yazar>
  </kitap>
</kitaplar>
```

SQL Kodu:

```
SELECT EXTRACTVALUE(xml_dize, '/kitaplar/kitap/baslik') AS kitap_baslik FROM kitaplar_tablosu;
```

Örnek SQL Injection Error Based Zafiyeti Tespiti:

[http://testphp.vulnweb.com/listproducts.php?cat=extractvalue\(rand\(\),concat\(1,\(SELECT database\(\)\)\)\);](http://testphp.vulnweb.com/listproducts.php?cat=extractvalue(rand(),concat(1,(SELECT database())));)



Şekil 9 SQL Injection Error Based Örneği.

concat(1, (SELECT database())) :

SQL enjeksiyonu gerçekleştirmek için kullanılan bir ifadedir. `SELECT database()` mevcut veri tabanının adını döndürmektedir. `concat(1, ...)` ifadesi, 1 ve `SELECT database()` sonucunu birleştirmektedir. Bu, SQL sorgusunda bir dize olarak ele alınacak ve `extractvalue()` işlevine verilecek olan XPath ifadesini oluşturur. `Extractvalue` fonksiyonun özelliği ile veri tabanı adı hata içine yazdırılarak manipüle edilmektedir.

2.3.3.2 Union Based SQLi

`UNION` deyimi SQL sorgularında iki tablodan verileri çekmek için kullanılmaktadır. Tabloları birleştirme işlemi yapılarak, farklı tablolardan alınan veriler tek bir sonuç kümesinde birleştirmektedir. SQL Sorgusu eklerken `UNION SELECT` (Union Operatörü) kullanılmaktadır. İki SQL sorgusu `UNION SELECT` ile birleştirilmektedir. İlk ifade normal bir sorgu iken, sonrasında zararlı sorgu `UNION SELECT` ile birleştirilmektedir. Bu nedenle, sistemdeki önleme ve tespit mekanizmalarını atlatmak için kullanılmaktadır.

Örnek UNION SQL sorgusu:

```
SELECT username, password FROM users_table
```

UNION

```
SELECT username, password FROM passwords_table;
```

UNION Based SQLi zafiyet türünde UNION operatörünü kullanırken birleştirilen sorguların **SELECT**

ifadeleri arasında aynı sayıda sütun bulunması gerekmektedir. Bu yüzden sütun sayılarının bilinmesi gerekmektedir. Sütun sayısını tespit edeceğimiz operatör ise **ORDER BY**'dir.

Örnek Uygulamalı UNION Based SQLi Senaryosu:

1.Adım: Sütun Sayısını Öğrenme

URL = <http://testphp.vulnweb.com/listproducts.php?cat=2 ORDER BY 11>

Web adresine erişim sağlandığında ve url incelendiğinde arka planda çalışan bir veri tabanı sorgusu olduğunu düşünebiliriz. Bu sorgu,

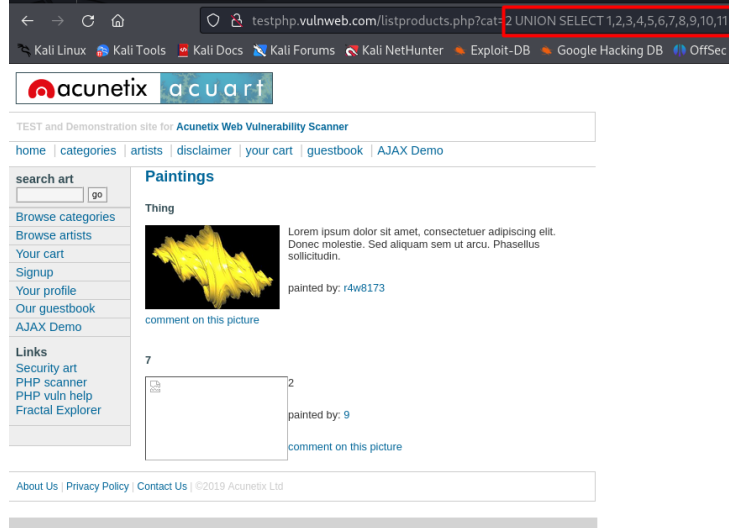
```
"SELECT product_name, price FROM products WHERE cat=2 ORDER BY 11"
```

Şeklinde sorgu olabilir ve sorguda yer alan, "**ORDER BY**" operatöründen hemen sonra gelen sayı, sıralamanın hangi sütuna göre yapılacağını belirtmektedir. Bu durumda, sayının 12 olarak değiştirilmesi bir hata mesajı döndürmektedir.

Bu hata mesajı, veri tabanındaki tablonun sadece 11 sütun içerdiğini ve 12. bir sütunun olmadığını göstermektedir. Dolayısıyla, bu hata mesajı, sorgunun çalıştırıldığı tablonun 11 sütun içerdiği sonucuna varmamızı sağlamaktadır.

2.Adım: Manipüle Edilecek Kısımların Tespiti

"UNION SELECT 1,2,3,4,5,6,7,8,9,10,11" Sorgusu, UNION SELECT ifadesini kullanarak iki veya daha fazla SQL sorgusunun sonuçlarını birleştirmektedir. Sorgunun geri kalan kısmı, sayılarla temsil edilen sütunlarla birlikte basit bir örnektir. Örneğin, 1,2,3,4,5,6,7,8,9,10,11 sütun başlıklarını temsil etmektedir. Sorgu çalıştırıldığında sayfada farklı sayılar keşfedilecektir.

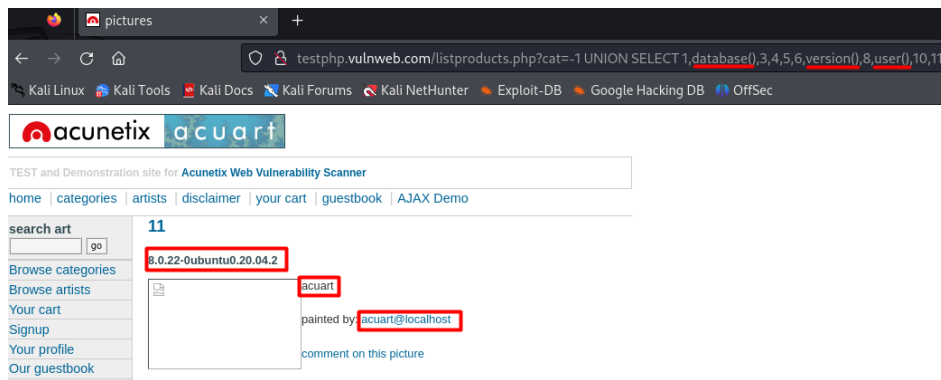


Şekil 10 (SQL Injection ile UNION SELECT Sorgusu)

Sorgu sonucunda sayfada 2,7 ve 9 sütunların görülmektedir. Bu bize bu belirli sütunlarda web sayfasındaki bilgileri görüntülemek için kullanıldığını göstermektedir. Bu sütunlar veri tabanından bilgi almak için kullanılmaktadır. 2,7 ve 9 sütunlarının herhangi birine yazılan yardımcı fonksiyonlarla veri tabanı hedeflenerek bilgi toplanabilmektedir.

“cat=-1 UNION SELECT 1,database(),3,4,5,6,version(),8,user(),10,11”

Sorgusu ile gidildiğinde 2,7 ve 9. sütunlar sırasıyla veri tabanı adı, işletim sistemi bilgisi, kullanıcı bilgilerine ulaşılmıştır. Sorguda değiştirilen -1 id değeri ilk çalışan sorguyu bloke etmek için kullanılmıştır. -1 değerli id olmadığı için UNION SELECT ile başlayan sorgu değeri sadece sayfada gözükmemektedir.



Şekil 11. Versiyon ismi ve user bilgileri yazdırma

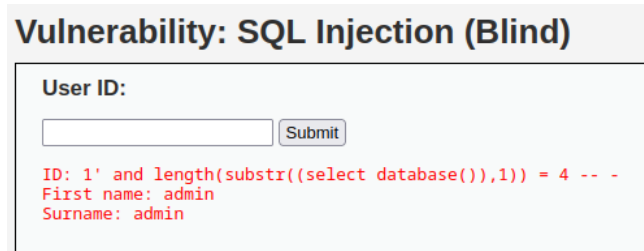
2.3.3.3 Blind Boolean Based SQLi

Blind Boolean Based SQL Injection, uygulamayı destekleyen veri tabanına bir SQL sorgusu göndermeye dayalı çıkarımsal bir SQL Injection türüdür. Sorgunun bir TRUE veya FALSE sonucu döndürmesine bağlı olarak, HTTP yanıtındaki içerik değişmekte veya aynı kalmaktadır. Bu,

saldırmanın, kullanılan yükün(payload) TRUE veya FALSE döndürdüğünü tahmin etmesine olanak tanımaktadır, ancak veri tabanından herhangi bir veri dönmemektedir. Özellikle büyük veri tabanlarında bu saldırı türü genellikle yavaş ilerlemektedir. Çünkü saldırının veri tabanını karakter karakter taraması gerekmektedir [9]. Blind Boolean Based, SQL Injection Tespitinde ilk adım, diğer SQL Injection türlerindeki bakış açılarıyla aynı olarak referans noktasına göre incelenmesidir. Farklı SQL sorguları yazılarak denemeler yapılmaktadır. Sunucunun hatalar üretmesine, ölçülebilir şekilde yavaşlamasına veya çökmesine neden olacak bir SQL enjeksiyon yükü oluşturularak incelenebilmektedir.

Uygulamalı Örnek:

İlk olarak Şekil 12'de görüldüğü gibi referans noktasına göre TRUE, FALSE kontrolü yapılmaktadır.



Şekil 12. SQL Injection Blind Örneği

1' and length(substr((select database()),1)) = 4 -- -

1' and ascii(substr((select database()),1)) > 20 -- -

1' and ascii(substr((select database()),1)) > 99 -- -

1' and ascii(substring((select database()),1,1)) > 100 -- -

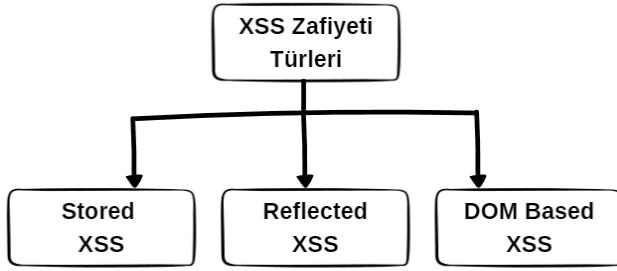
Bu gibi payloadlar ile ASCII eşitliği kontrol edilmekte ve veri tabanı tablosunun isminin karakteri bulunmaktadır.

2.3.3.4 Time Based SQLi

Time Based SQLi zafiyetinde, veri tabanının bir SQL sorgusu aldığı anda yanıt vermeden önce belirli bir süreyi (saniye cinsinden) beklemesine dayanan bir tekniktir. Saldırın, yanıt süresinden sonucun DOĞRU mu YANLIŞ mı olduğunu çıkarabilmektedir. Yanıt gecikmesi sonuca bağlıdır. Dolayısıyla, saldırın tarafından veri tabanı ve uygulama hakkında bilgi edinebilmektedir [10]. SQL Injection varlığı Time Based SQLi payloadları ile tespit edilebilmektedir.

2.3.4 XSS (Cross Site Scripting)

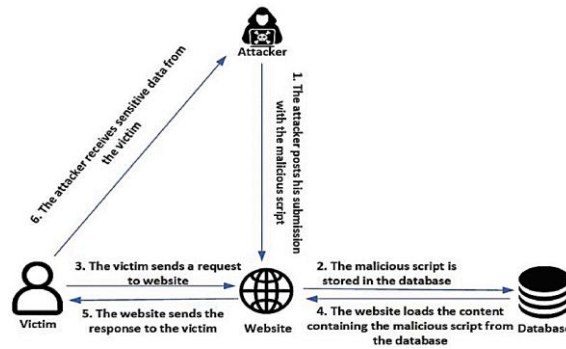
Siteler arası kod çalıştırma zafiyetidir. Genellikle kullanıcı hedef alınarak bir web sitesine kötü niyetli betiklerin enjekte edilmesiyle gerçekleştirilen bir saldırdır. Cross Site Scripting (XSS) güvenlik zafiyeti en yaygın web uygulama açıklarından biridir. XSS güvenlik zafiyeti Stored, Reflected ve DOM olmak üzere 3 çeşittir. Reflected XSS, kullanıcıdan beklenen girişlerin javascript kodları girilerek çalıştırılan zafiyet türüdür. Stored XSS girilen girişler sonucunda veri kayıtlarına işlenen kalıcı XSS türüdür. Dom XSS ise DOM nesnelere kullanılarak oluşan zafılardır [11].



Şekil 13. XSS Zafiyeti Türleri

2.3.4.1 Stored XSS

Bu zafiyet türünde, payload, veri tabanında veya arka uç sunucusunda kalıcı olarak depolanmaktadır. Bir kurban o web sayfasını gezdiğinde, kötü amaçlı veri sunucudan alınmaktadır

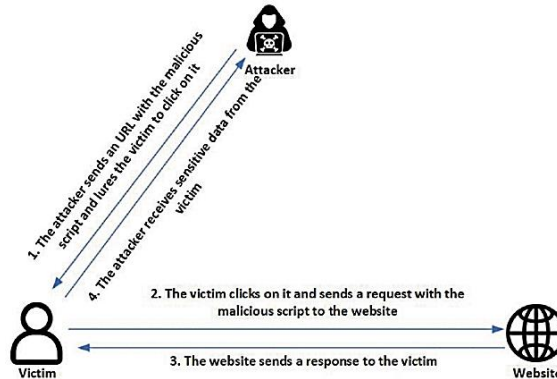


[12].

Şekil 14 Stored XSS [13].

2.3.4.2 Reflected XSS

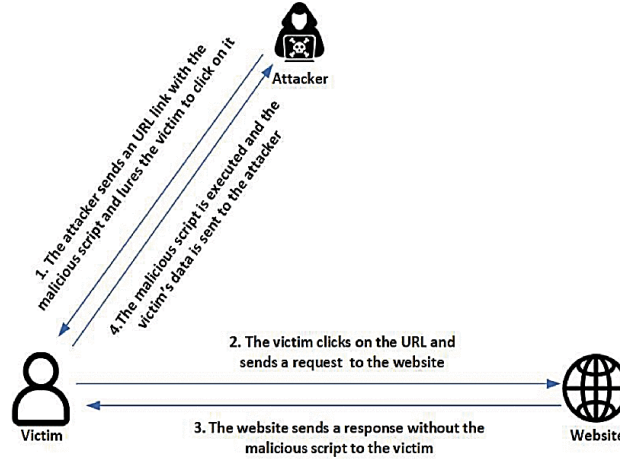
Bu zafiyet türü, Non-persistent veya tip-II saldırılar olarak adlandırılmaktadır. Saldırgan, kötü niyetli betik girebilir, bu da sunucudan hemen HTTP yanıtını dinamik olarak işlenmektedir. Eğer herhangi bir kullanıcı payload içeren URL'i ziyaret ederse, yönlendirilmektedir ve bu da kullanıcının özel bilgilerinin tehlikeye girmesine neden olabilmektedir. Sayfa yenilenmesi sonucunda yapılan saldırının etkilerinin ortadan kalktığı görülmektedir.



Şekil 15 Reflected XSS [13].

2.3.4.3 Dom Based XSS

Bu zafiyet türü, DOM (Document Object Model) tabanlı XSS, Cross Site Scripting kötü niyetli komut dosyasının DOM ortam nesnelere müdahale edilmesi sonucunda çalıştırıldığı bir saldırı türüdür. Saldırı, sayfa içinde tetiklenir, ancak istek/yanıt çiftine ihtiyaç duyulmamaktadır [14].



Şekil 16 Dom-Based XSS [13].

Örnek Senaryo DOM Based XSS Kod Örneği:

```
<div id="content">
  <div>
    <p>Please, enter your nick and press
      <strong>chat</strong>!
    </p>
    <input id="nameInput" name="name" type="text" size="50" /><br />
    <input id="chatButton" name="chat" value="Chat" type="button" />
  </div>
</div>
<script src="https://code.jquery.com/jquery-3.6.0.min.js"></script>
<script>
  $('#chatButton').click(function () {
    var name = $('#nameInput').val();
    $('#content > div').fadeOut(null, function () {
      $(this).html('<p>Welcome ' + name +
        '! You can type your message into the form below.</p><textarea
class="pane">'
        + name + ' &gt;\n</textarea>');
      $(this).fadeIn();
    });
  });
</script>
```

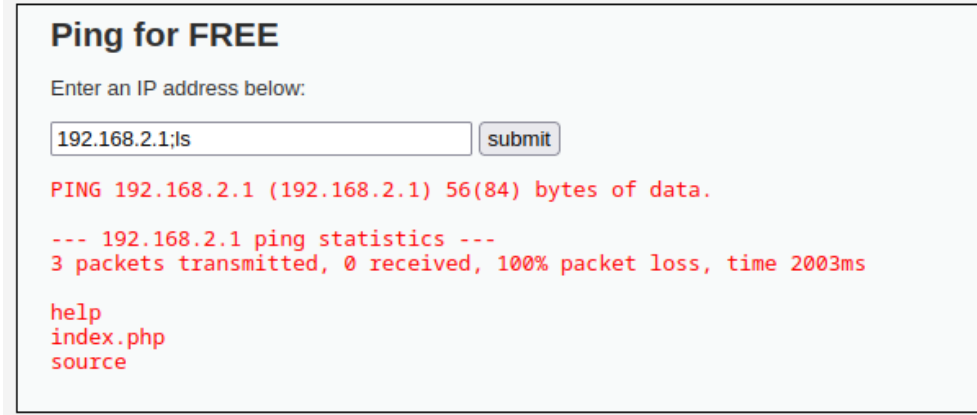
Şekil 17 DOM Based XSS Kod Örneği.

2.3.5 Code Injection (Kod Enjeksiyonu)

Saldırganın uygulama içinde kötü amaçlı kodların çalıştırılmasına olanak tanıyan bir saldırı türüdür. Bu saldırılar genellikle uygulamanın güvenli olmayan bir şekilde kullanıcı girdilerini işlemesi sonucunda ortaya çıkar. Saldırgan, bu şekilde uygulama içinde komutlar çalıştırarak sistemi ele geçirebilir veya istenmeyen işlemler gerçekleştirebilir. Bu nedenle, geliştiricilerin kullanıcı girdilerini dikkatlice işlemesi ve güvenlik kontrolleri yapması önemlidir.

Örnek Command Injection Senaryo:

IP adreslerine ping atabileceğimiz bir web uygulaması bulunduran DVWA kaynak kodu incelenmiştir. IP adresi yanına bir komut eklenmiş ve istek gönderilmiştir. Geri dönüt incelendiğinde komutun çalıştığı ve dosyaların listelendiği görülmüştür. POST edilen ip adresi işletim sisteminde direkt olarak `shell_exec()` fonksiyonu ile komut çalıştırılmaktadır. Bu kısım manipüle edilerek işletim sisteminde "`cat /etc/passwd`" komutu çalıştırılarak, kullanıcı adları ve şifrelenmiş parolalar okunabilmektedir.



Şekil 18 Code Injection Örneği.

Injection Önleme Yöntemleri;

- Giriş doğrulama ve parametrelili sorgular kullanılmalıdır.
- Veri temizleme işlemleri gerçekleştirilmelidir.
- En az ilke (Least Privilege) uygulanmalıdır.
- Kurumsal ağlar için güvenlik duvarları ve saldırı tespit sistemleri kullanılmalıdır. Örneğin; WAF
- Sürekli güncelleştirmeler ve iyileştirilmeler yapılmalıdır. (Wordpress ve plugin sürümlerinin eski olmasından kaynaklı olarak çok zafiyet ortaya çıktığı görülmüştür.)

2.4 Insecure Design (Güvensiz Tasarım)

Yazılım ve sistemlerdeki tasarım ve mimari hatalarını ifade eden geniş bir kategoridir. Bu hatalar, "eksik veya etkisiz kontrol tasarımı" olarak ifade edilmektedir. Güvensiz tasarım, tüm diğer OWASP Top 10 risk kategorilerinin kaynağı değildir. Güvensiz tasarım ile güvensiz uygulama arasında bir fark vardır. Tasarım hataları ile uygulama hataları farklı kök nedenlere ve çözümlere sahiptir. Güvenli bir tasarım, uygulama hataları içerebilir ve bu hatalar saldırılara karşı savunmasızlıklara yol açabilmektedir. Güvensiz bir tasarım, mükemmel bir uygulama ile düzeltilemez çünkü gerekli güvenlik kontrolleri, belirli saldırılara karşı savunmak için hiç oluşturulmamıştır.

2.4.1 IDOR (Insecure Direct Object Reference)

IDOR, Güvensiz doğrudan nesne referansları, yetkisiz veri erişimine yol açmaktadır. Senaryo olarak bir saldırgan kütüphane içinde erişmesi gereken kitaplar dışındaki kitaplara yetkisiz veri erişmeye çalışmaktadır. Örneğin saldırganın 1,2,3,4 id ye sahip kitapların bilgisine ulaşmak istemektedir. URL ile id değiştirerek denemeler yapmaktadır.

<https://example.com/books?id=1> urline HTTP isteği gittiğinde 1. kitabı görüntülemektedir.

4. kitabı incelemek için

<https://example.com/books?id=4> adresine istek yapmakta ve 4. kitabın bilgilerini yetkisiz olarak erişilebilmektedir.

```
const mysql = require("mysql");
const bookId = req.query.id;

const query = `SELECT * FROM books WHERE id = ${bookId}`;
connection.query(query, (error, results) => {
  if (error) {
    console.error("Error fetching book details:", error);
    res.status(500).send("Internal server error");
  } else {
    if (results.length > 0) {
      const bookDetails = results[0];
      res.status(200).json(bookDetails);
    } else {
      res.status(404).send("Book not found");
    }
  }
});
```

Şekil 18. IDOR Kod Örneği

Bu web uygulamasında yeterli yetkilendirme kontrollerini uygulanmadığı için, veri tabanı sorgusu başarıyla çalışmaktadır ve 4 numaralı kitabın bilgilerini almaktadır. Sonuç olarak, saldırganın görüntülenmemesi gereken bir kitabın detaylarına erişimi bulunduğu görülmüştür.

2.4.2 Insecure Design Önleme Yöntemleri

- En az ayrıcalık tanınarak yazılım mimarisi kullanılması gerekmektedir.
- Yazılım mimarileri güvenlik düşünülerek inşa edilmesi gerekmektedir.
- Birim ve entegrasyon testleri yapılması gerekmektedir.

SONUÇ

Siber tehditler karmaşıklık ve sıklık açısından gelişmeye devam ettikçe web uygulaması güvenliği kritik bir endişe kaynağı olmaya devam ediyor. Güvenlik açıklarının etkili bir şekilde tespit edilmesi ve azaltılması, hassas verilerin korunması, kullanıcı güveninin sürdürülmesi ve web hizmetlerinin bütünlüğünün ve kullanılabilirliğinin sağlanması açısından çok önemlidir. Bu makalede, siteler arası komut dosyası çalıştırma (XSS), SQL enjeksiyonu ve sunucu yanlış yapılandırmaları gibi web uygulamalarını etkileyebilecek çeşitli güvenlik açıklarının yanı sıra bu tehditleri tespit etmek için kullanılan metodolojiler ve araçlar vurgulanmıştır. Otomatik tarama, manuel kod incelemeleri ve

sızma testi gibi tespit teknikleri, potansiyel güvenlik zayıflıklarının istismar edilmeden önce tespit edilmesinde önemli bir rol oynar. Sürekli izleme ve düzenli güvenlik açığı değerlendirmeleriyle birleştirilen bu yöntemler, proaktif bir güvenlik duruşunun temelini oluşturur.

Web zafiyetlerini azaltma stratejileri de aynı derecede hayati öneme sahiptir ve kapsamlı bir yaklaşımı kapsamalıdır. Bu, sağlam teknik kontrollerin uygulanmasını, güvenli kodlama uygulamalarına bağlı kalınmasını ve etkili güvenlik protokollerinin uygulanmasını içerir. Temel azaltıcı önlemler arasında güvenlik başlıklarının kullanımı, giriş doğrulama ve erişim kontrol mekanizmaları yer alır. Yazılımları ve kitaplıkları güncel tutmak ve güvenlik yamalarını derhal uygulamak, potansiyel istismarlara karşı savunmayı daha da güçlendirir. Ek olarak, geliştiriciler ve yöneticiler arasında bir güvenlik farkındalığı kültürünün geliştirilmesi çok önemlidir. Düzenli eğitim ve ortaya çıkan tehditler ve en iyi uygulamalar hakkında bilgi sahibi olmak, tüm paydaşların web uygulamalarının güvenliğine katkıda bulunacak donanıma sahip olmasını sağlar.

Sonuç olarak, web uygulamalarının güvenliğinin sağlanması, gelişmiş tespit tekniklerini, etkili risk azaltma stratejilerini ve sürekli eğitimi birleştiren çok yönlü bir yaklaşım gerektirir. Kuruluşlar proaktif ve kapsamlı bir güvenlik çerçevesini benimseyerek güvenlik açıklarından yararlanma riskini önemli ölçüde azaltabilir, böylece uygulamalarını ve işledikleri hassas verileri koruyabilirler. Web uygulaması güvenliği uygulamalarının devam eden gelişimi, sürekli değişen siber tehdit ortamına karşı koymak için çok önemlidir. Web uygulamalarının güvenliği, hassas verilerin korunması, kullanıcı güveninin sağlanması ve iş sürekliliğinin sağlanması açısından son derece önemlidir. Kuruluşlar ve geliştiriciler, güvenlik açıklarını azaltmak için bilgilerini sürekli güncellemeli ve en iyi uygulamaları uygulamalıdır. OWASP Top 10 güvenlik açıklarını anlayarak ve ele alarak, web uygulaması güvenliğinde önemli adımlar atılabilir.

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**THE ROLE OF CHRONIC ADMINISTRATION OF CLOZAPINE TO
EXPERIMENTAL ANIMALS IN THE DEVELOPMENT OF REPRODUCTIVE
DYSFUNCTION**

**KLOZAPININ EKSPERIMENTAL HEYVANLARA XRONIKI TƏYİNİNİN
REPRODUKTIV DISFUNKSIYANIN INKIŞAFINDA ROLU**

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Actuality. According to the World Health Organization (WHO), one in four people worldwide suffers from psychological and neurological disorders at some point in their lives. Mental disorders occur most often among young people of reproductive age. In the formation of these disorders, the stresses that people receive during their lives play an important role. Mental disorders such as depression, schizophrenia, eating disorders, and excessive use of harmful substances are more common at young ages. In general, 10-15% of young people suffering from mental illness use the help of professionals to return to a normal life. Complications of mental disorders during family planning and pregnancy are also observed in such young people. Information about changes in the concentration of sex hormones in men and women who suffer from mental illness and take antipsychotic drugs, and how these drugs will affect the fetus during pregnancy. The few and contradictory results make it necessary to study and investigate the effect of these substances on the concentration of sex hormones.

Research materials and methods. Researches were conducted on 30 white rats of both sexes, weighing 170-190g, grown in the vivarium of the Scientific Research Center of Azerbaijan

Medical University. After the animals were divided into 3 groups according to sex, the first male control group, and the other 2 groups were clozapine 10; at a dose of 20 mg/kg, the 2nd female control group, and clozapine 10 in the other 2 groups; The concentration of reproductive hormones (Tü, Ts, FSH, LH, PL, PG, ER, ED) was determined in the blood taken from the tail vein by chronically injecting a dose of 20 mg/kg into the abdominal cavity of animals. The rules of the European Parliament and the European Union for the Protection of Animals were followed when conducting scientific research.

Student's t-test, Wilcoxon-Manna-Whitney's non-parametric U-test were used to calculate the experimental data. The results were processed with the help of Microsoft Excel (Office-2010) statistical program.

Obtained results and their discussion. Against the background of chronic administration of clozapine at a dose of 10 mg/kg, concentrations of hormones Tu, Ts, FST, LH, PL (with exception), PG, ER, ED in the blood of male rats significantly decreased. As it can be seen, the hormone Tu decreased by 6.4%, the hormone Ts decreased by 5%, and FSH decreased by 31.1%. The decline of these hormones will probably have negative consequences in the next generation. This decrease was also observed in concentrations of LH, PG, ER, ED hormones. According to the % indicators, the decrease varied as follows: -44.5%, 14.2%, -45.5%, -65.8%, and -96.3%. As mentioned above, a decrease was observed in all cases, except PL, and the obtained results are reliable. During the chronic use of 20 mg/kg of clozapine, the change in the concentration of sex hormones was relatively deeper than that of 10 mg/kg of clozapine.

Against the background of the chronic administration of 10 mg/kg of clozapine compared to the control group female animals, these indicators changed in % confidence as follows: -14.3%, -14%, -22.2%, -62.8%, 11.3%, -42.2%, -40.5%, and -28.2%. PL increased by 11.3% from the chronic effect of 10mg/kg clozapine compared to the control group. Clozapine had a dose-dependent effect at a dose of 20 mg/kg. Thus, clozapine at a dose of 20 mg/kg, compared to the indicators of the control group, reduced the concentration of the T hormone in the blood by 28.6%, the concentration of the Ts hormone by 20.3%, the concentration of the FSH hormone by 24.7%, the concentration of the LH hormone by 64%, the concentration of the PG hormone by 43, 8% decreased the concentration of ER hormone by 43.7%, ED hormone concentration by 35.7%, and statistically increased the concentration of PL hormone by 23.7%.

Analyzing the results of our research, we conclude that long-term administration of antipsychotic drugs reduces the amount of neurotransmitters, especially monoamines, in various structures of the brain. A decrease in the amount of monoamines in the brain leads to a change in the concentration or ratio of many neuropeptides that play an important role in the functioning of the reproductive system. It has been proved that there is a relationship between these reductions and a decrease in the concentration of LH. Chronic intake of antipsychotic drugs not only decreased the concentration of LH, but at the same time, it can be said that the decrease in the concentration of all sex hormones, except for PL, was observed.

Aktuallıq. Ümumdünya Səhiyyə Təşkilatının (ÜST) məlumatına görə bütün dünyada hər dörd adamdan biri həyatının müəyyən dövrlərində psixoloji və nevroloji pozulmalardan əziyyət çəkir. Psixi pozulmalar ən çox reproduktiv yaş dövründə olan gənclər arasında təsadüf edir. Bu pozulmaların əmələ gəlməsində insanların yaşadığı dövrdə aldığı streslər mühüm rol oynayır. Gənc yaşlarda daha çox psixi pozulmalardan depressiyalara, şizofreniyaya, qidalanma pozulmalarına, zərərli maddələrdən izafi istifadəyə daha çox rast gəlinir. Ümumi olaraq psixi xəstəliklərdən əziyyət çəkən gənclərin 10-15%-i normal həyata qayıtmaq üçün mütəxəssislərin köməyindən istifadə edirlər. Belə gənclərdə də ailə planlaşdırılmasında, hamiləlik zamanı psixi pozulmaların ağırlaşmaları müşahidə olunur. Psixi xəstəlikdən əziyyət çəkən, antipsixotik dərman maddələri qəbul edən kişi və qadınlarda həmin dərman

maddələrinin qəbulu fonunda cinsi hormonların qatılığında əmələ gələn dəyişikliklərin, digər tərəfdən baş verəcək hamiləlik zamanı həmin dərman maddələrinin dölə necə təsir göstərəcəyi barədə məlumatların az və ziddiyətli olması, bu maddələrin cinsi hormonların qatılığına təsirinin daha dərinədən öyrənilməsi və araşdırılmasını zərurətə çevirir.

Tədqiqatların material və metodları. Tədqiqatlar Azərbaycan Tibb Universitetinin Elmi-Tədqiqat Mərkəzinin vivariumunda yetişdirilmiş çəkisi 170-190q olan hər iki cinsdən olan 30 ağı siçovul üzərində aparılmışdır. Heyvanlar cinsə uyğun 3 qrupa ayrıldıqdan sonra, birinci erkək nəzarət qrupu, digər 2 qrupda isə klozapin 10; 20 mq/kr dozada, 2-ci dişi nəzarət qrupu, digər 2 qrupda isə klozapinin 10; 20mq/kq dozasını heyvanların qarın boşluğuna xroniki inyeksiya olunmaqla quyruq venasından götürülmüş qanda reproduktiv hormonların (Tü, Ts, FSH, LH, PL, PG, ER, ED) qatılığı təyin olunmuşdur. Avropa Parlamentinin və heyvanların qorunması üzrə Avropa ittifaqının elmi-tədqiqatlar apararı zaman heyvanlarla düzgün davranmaq qaydalarına əməl olunmuşdur.

Eksperimental məlumatların hesablanması üçün Studentin t-meyarı, Vilkokson-Manna-Uitninin qeyri-parametrik U-meyarı tətbiq edilmişdir. Nəticələr Microsoft Excel (Office-2010) statistik proqramın köməyi ilə işlənmişdir.

Alınmış nəticələr və onların müzakirəsi. Tədqiq olunan klozapinin 10mq/kq dozada xroniki təyini fonunda erkək siçovulların qanında Tü, Ts, FST, LH, PL (istisna olunmaqla), PG, ER, ED hormonların qatılıqları nəzərəcarpacaq dərəcədə azalmışdır. Göründüyü kimi Tü hormonu 6,4%, Ts hormonu 5%, FSH isə 31,1% statistik dürüst azalmışdır. Bu hormonların azalması gələcək törənən nəsildə yəqin ki, öz mənfi fəsadlarını verəcəkdir. Bu azalma LH, PG, ER, ED hormonlarının qatılıqlarında da müşahidə olunmuşdur. % göstəricilərinə uyğun olaraq azalma aşağıdakı kimi dəyişmişdir: -44,5%, 14,2%, -45,5%, -65,8%, və -96,3%. Yuxarıda qeyd olunduğu kimi PL istisna olmaqla bütün hallarda azalma müşahidə olunmuşdur, alınan nəticələr isə etibarlıdır. Klozapinin 20 mq/kq dozada xroniki istifadəsi zamanı cinsi hormonların qatılığında olan dəyişiklik 10 mq/kq dozada klozapinlə müqayisədə nisbətən dərinləşmişdir.

Nəzarət qrupu dişi heyvanların göstəriciləri ilə müqayisədə klozapinin 10 mq/kq dozasının xroniki təyini fonunda bu göstəricilər % etibarlı ilə uyğun olaraq aşağıdakı kimi dəyişmişdir: -14,3%, -14%, -22,2%, -62,8%, 11,3%, -42,2%, -40,5%, və -28,2%. PL nəzarət qrupunun göstəriciləri ilə müqayisədə 10mq/kq klozapinin xroniki təsirindən 11,3% artırmışdır. Klozapinin 20 mq/kq dozada dozadanasılı effekt törətmişdir. Belə ki, klozapin 20 mq/kq dozada nəzarət qrupunun göstəriciləri ilə müqayisədə Tü hormonunun qandakı qatılığını 28,6%, Ts hormonunun qatılığını 20,3%, FSH hormonunun qatılığını 24,7%, LH hormonunun qatılığını 64%, PG hormonunun qatılığını 43,8%, ER hormonunun qatılığını 43,7%, ED hormonunun qatılığını 35,7% azaltdığı halda, PL hormonunun qatılığını 23,7% statistik dürüst artırmışdır.

Aparığımız tədqiqatların alınmış nəticələrini təhlil edərək belə qənaətə gəlirik ki, antipsixotik dərman maddələrinin uzunmüddətli qəbulu baş beyinin müxtəlif strukturlarında neyromediatorların, xüsusilə monoaminlərin miqdarını azaldır. Baş beyində monoaminlərin miqdarının azalması cinsi sistemin fəaliyyətində mühüm rol oynayan bir çox neuropeptidlərin qatılığının və yaxud nisbətinin dəyişməsinə səbəb olur. Bu azalmalar ilə LH-un qatılığının azalması arasında əlaqənin olması sübuta yetirilmişdir. Antipsixotik dərman maddələrinin xroniki qəbulu təkcə LH-un qatılığının azalması ilə deyil, eyni zamanda demək olar ki, PL müstəsna olmaqla bütün cinsi hormonların qatılığında azalmanın əm ələ gəlməsinə səbəb olmuşdur.

**STUDY OF THE PROOXIDANT EFFECTS THAT DEVELOP AGAINST THE
BACKGROUND OF CHRONIC HALOPERIDOL ADMINISTRATION**

**HALOPERIDOLUN XRONIKI TƏYİNİ FONUNDA INKIŞAF EDƏN PROOKSIDANT
EFFEKTŁƏRİN TƏDQIQI**

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Actuality. In the last 23 years of the 21st century, there has been an increase in the number of people suffering from mental illnesses all over the world. Mental illnesses occur most often among young people. Mental disorders such as depression, schizophrenia, eating disorders, and excessive use of harmful substances are more common in young people. In general, 10-15% of young people suffering from mental illness use the help of professionals to return to a normal life. Haloperidol is one of the most commonly used drugs in the treatment of treatment-resistant mental illnesses. Long-term use of haloperidol by patients leads to the development of serious disorders at the level of the brain. Although some scientists attribute this to the pro-oxidant effect of haloperidol, some scientists deny this. Taking into account the above, we studied how long-term haloperidol intake affects the amount of LPO products in brain structures.

Materials and methods of research. Researches were conducted on 15 male white rats of both sexes weighing 170-200g. After the animals were divided into 3 groups, the first group was the control group, and the other 2 groups received haloperidol 0.5; The effect on the amount of LPO products was studied by chronic injection into the abdominal cavity of animals at a dose of 3 mg/kg. Two hours after the last intra-abdominal injection of the investigated doses of haloperidol, the animals were decapitated and brain structures were removed, homogenate was prepared and the amount of LPO products was determined. The rules of the European Parliament and the European Union for the Protection of Animals were followed when conducting scientific research.

Student's t-test, Wilcoxon-Manna-Whitney's non-parametric U-test were used to calculate the experimental data. The results were processed with the help of Microsoft Excel (Office-2010) statistical program.

Results and their Discussion. As a result of our research, it was found that haloperidol 0.5; At a dose of 3 mg/kg, the amount of LPO products in different structures of the brain (hypothalamus, frontal cortex, striatum) changed in the following order. Thus, compared to the indicator of the control group, the amount of DK in the homogenate prepared from the hypothalamus increased by 28.5% under the influence of 0.5 mg/kg haloperidol, and 1.4 times over the influence of 3 mg/kg haloperidol $p < 0.01$. Compared to the control group, the amount of HP in the homogenate prepared from the hypothalamus increased by 23.1% under the effect of 0.5mg/kg haloperidol, and 1.9 times over the chronic effect of 3mg/kg haloperidol. The amount of MDA increased by 32.1% against the background of chronic administration of 0.5 mg/kg haloperidol, and increased 2.5 times under the influence of 3mg/kg haloperidol. The amount of DK in the homogenate prepared from the frontal cortex increased by 44.6% in the background of chronic administration of 0.5 mg/kg haloperidol and 2.4 times in the background of chronic administration of 3 mg/kg haloperidol compared to the indicator of the control group. The amount of HP increased by 31.9% against the background of chronic administration of 0.5mg/kg haloperidol, and 2 times against the background of chronic administration of 3mg/kg haloperidol. The amount of MDA increased by 32.4% under the influence of 0.5 mg/kg haloperidol and 2.2 times over the influence of 3 mg/kg haloperidol compared to the indicator of the control group. The amount of DK in the homogenate prepared from the striated body increased by 27.8% under the influence of 0.5 mg/kg haloperidol, and 2.9 times under the influence of 3mg/kg haloperidol compared to the control group. The amount of HP increased by 24.3% under the influence of 0.5 mg/kg haloperidol and 2.3 times over the influence of 3 mg/kg haloperidol. The amount of MDA was statistically significantly increased by 21.9% under the influence of 0.5 mg/kg haloperidol and 2.1 times over the influence of 3 mg/kg haloperidol. According to the well-known theory, haloperidol enhances the flow of calcium ions into cells by blocking dopamine receptors, and at the same time, by activating the monoamine oxidase enzyme, it enhances the formation of free radicals by enhancing the metabolism of dopamine. Activated free radicals also increase the amount of LPO products by oxidizing unsaturated fatty acids.

Aktuellhə. XXI-əsrin keçən 23 ilində bütün dünyada psixi xəstəliklərdən əziyyət çəkən insanların sayında artım baş vermişdir. Psixi xəstəliklər ən çox gənclər arasında təsadüf edir. Gənc yaşlarda daha çox psixi pozulmalardan depressiyalara, şizofreniyaya, qidalanma pozulmalarına, zərərli maddələrdən izafə istifadəyə rast gəlinir. Ümumi olaraq psixi xəstəliklərdən əziyyət çəkən gənclərin 10-15%-i normal həyata qayıtmaq üçün mütəxəssislərin köməyindən istifadə edirlər. Müasir dövrdə müalicəyə dözümlü psixi xəstəliklərin müalicəsində ən çox istifadə olunan dərman maddələrindən biri

haloperidoldur. Haloperidolun uzunmüddətli xəstələr tərəfindən qəbulu baş beyin səviyyəsində ciddi pozulmaların inkişaf etməsinə səbəb olur. Bəzi alimlər bunu haloperidolun prooksidant təsir effekti ilə əlaqələndirənlər də, bəzi alimlər bunu inkar edir. Qeyd olunanları nəzərə alaraq haloperidolun uzunmüddətli qəbulunun baş beyin strukturlarında LPO məhsullarının miqdarına necə təsir göstərməsini tədqiq etdik.

Tədqiqatın material və metodları. Tədqiqatlar çəkisi 170-200q hər iki cinsdən olan 15 erkək ağ siçovul üzərində aparılmışdır. Heyvanlar 3 qrupa ayrıldıqdan sonra, birinci qrup nəzarət qrupu, digər 2 qrupda isə haloperidol 0,5; 3 mq/kg dozada heyvanların qarın boşluğuna xroniki inyeksiya olunmaqla LPO məhsullarının miqdarına təsiri tədqiq olunmuşdur. Heyvanlara haloperidolun tədqiq olunan dozalarının axırncı qarındaxili inyeksiyasından iki saat sonra başları kəsilmiş və beyin strukturları çıxarılaraq homogenat hazırlanmış və LPO məhsullarının miqdarı təyin olunmuşdur. Avropa Parlamentinin və heyvanların qorunması üzrə Avropa ittifaqının elmi-tədqiqatlar aparılan zaman heyvanlarla düzgün davranmaq qaydalarına əməl olunmuşdur. Eksperimental məlumatların hesablanması üçün Styudentin t-meyarı, Vilkokson-Manna-Uitninin qeyri-parametrik U-meyarı tətbiq edilmişdir. Nəticələr Microsoft Excel (Office-2010) statistik proqramın köməyi ilə işlənmişdir.

Alınmış nəticələr və onların müzakirəsi. Apardığımız tədqiqatlar nəticəsində məlum olmuşdur ki, haloperidol 0,5; 3 mq/kg dozada baş beyinin müxtəlif strukturlarında (hipotalamusda, frontal qabıq, zolaqlı cisim) LPO məhsullarının miqdarını aşağıdakı qaydada dəyişmişdir. Belə ki, nəzarət qrupunun göstəricisi ilə müqayisədə hipotalamuslarından hazırlanmış homogenatda DK-nın miqdarı 0,5 mq/kg haloperidolun təsirindən 28,5%, 3 mq/kg haloperidolun təsirindən isə 1,4 dəfə artmışdır $p < 0,01$. Nəzarət qrupunun göstəricisi ilə müqayisədə HP-in miqdarı hipotalamusdan hazırlanmış homogenatda 0,5mq/kg haloperidolun təsirindən 23,1%, 3mq/kg haloperidolun xroniki təsirindən isə 1,9 dəfə artmışdır. MDA-nın miqdarı nəzarət qrupunun göstəricisi ilə müqayisədə 0,5 mq/kg haloperidolun xroniki təyini fonunda 32,1%, 3mq/kg haloperidolun təsirindən isə artaraq 2,5 dəfə artmışdır. Frontal qabıqdan hazırlanmış homogenatda DK-nın miqdarı nəzarət qrupunun göstəricisi ilə müqayisədə 0,5 mq/kg haloperidolun xroniki təyini fonunda 44,6% 3mq/kg haloperidolun xroniki təyini fonunda isə 2,4 dəfə artmışdır. HP-in miqdarı 0,5mq/kg haloperidolun xroniki təyini fonunda 31,9%, 3mq/kg haloperidolun xroniki təyini fonunda isə 2 dəfə artmışdır. MDA-nın miqdarı nəzarət qrupu nun göstəricisi ilə müqayisədə 0,5mq/kg haloperidolun təsirindən 32,4%, 3 mq/kg haloperidolun təsirindən isə 2,2 dəfə artmışdır. Zolaqlı cisimdən hazırlanmış homogenatda DK-nın miqdarı nəzarət qrupunun göstəricisi ilə müqayisədə 0,5 mq/kg haloperidolun təsirindən 27,8%, 3mq/kg haloperidolun təsirindən isə 2,9 dəfə artmışdır. HP-in miqdarı 0,5 mq/kg haloperidolun təsirindən 24,3%, 3 mq/kg haloperidolun təsirindən isə 2,3 dəfə statistik dürüst artmışdır. MDA-nın miqdarı 0,5 mq/kg haloperidolun təsirindən 21,9%, 3 mq/kg haloperidolun təsirindən isə 2,1 dəfə statistik dürüst artmışdır. Məlum nəzəriyyəyə görə haloperidol dofamin resptorlarını blokada etməklə hüceyrə-daxilinə kalsium ionlarının axınını gücləndirir, eyni zamanda monoaminoksidaza fermentini aktivləşdirməklə, dofaminin metabolizmini gücləndirməklə sərbəst radikalların əmələ gəlməsini gücləndirir. Əmələ gəlmiş sərbəst radikallar da doymamış piy turşularını oksidləşdirməklə LPO məhsullarının miqdarını artırır.

VIOLENCE IN PRIME TIME: THE EFFECT OF REPRESENTATIONS OF VIOLENCE ON AUDIENCE PERCEPTION

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Abstract

Television, which is a part of traditional media, is losing its former popularity day by day as digital platforms enter human life. Although television's audience has decreased relatively, it still continues to operate as one of today's important media devices. Despite this decrease, TV series produced for entertainment purposes appeal to a certain segment of society. The majority of the series are in the prime time zone. Since prime time is known as the time period with the highest audience, television channels allocate their best content to this time period. Therefore, the content of the TV series broadcast during peak viewing hours is of great importance. In this context, the sample of the study is the "Yalı Çapkını" series, broadcast on Star TV, which is scripted and inspired by real life, according to the information on the screen. The study covers 39 episodes broadcast in the first season, within the framework of the example of the "Yalı Çapkını" series. The research aimed to examine audience reactions to the violent scenes in the relevant episodes. The study is important because it provides guidance for production companies. For this purpose, an analysis was carried out on the complaints written on the "şikayetvar.com" website between 25.09.2022 and 30.12.2023. The reason why this website was chosen is that it is very easy for anyone to write a complaint. In the review, complaints including audience reactions were categorized thematically and tabulated with the help of qualitative content analysis. The findings show that the series contains representations of physical, economic and psychological violence and sexual harassment, and only 19% of the viewers who reported complaints were disturbed by this situation. The data shows that complaints about violence constituted approximately 19% of the complaints about the series, and that violence has become ordinary and its visibility has decreased. With this research, it has been concluded that the representations of violence seen in television series may affect the viewers' attitudes towards violence.

Keywords: Representation of Violence, Audience Reaction, Yalı Çapkını, Television Series, Şikayetvar.com.

INTRODUCTION

Violence, as a word, was transferred to Turkish from Arabic. It has the meanings of "hardness", "hardness" and "firmness" (İsimsiz, 1977). Violence has existed throughout the history of human existence. For this reason, it can be seen as natural in societies. Women, children and the elderly are the groups most exposed to violence (Polat, 2016). It would not be wrong to say that the action is implemented as a control device for violence. This control device occurs in the form of someone "declaring who is powerful" against someone else. According to Adak (2000), family structure, social life and culture are effective in committing acts of violence. It can occur in different ways throughout life. However, the level of perception is as important as the forms in which it appears. The type of violence that we are

most aware of is physical violence, as it can be seen with the eye and felt with the body. Psychological and economic violence is mostly ignored or not noticed at all. While both types of violence within the family are common, they are often not revealed.

Violence against women is considered a major human rights violation that is prevalent all over the world. It has been the subject of various studies for many years. The "United Nations Convention on the Prevention and Punishment of Violence Against Women and Domestic Violence" defines violence against women as any act of discrimination "based on gender" and any act that harms or threatens women physically, psychologically, sexually or economically. . According to data from the World Health Organization, one in every three women in the world is exposed to violence. This rate varies depending on the income level of the countries and increases in low and middle income countries (Altınay and Arat, 2008). The data obtained by the Turkish Statistical Institute (TUIK) in its research titled "Gender Statistics" conducted in 2022 shows that 36% of women living in Turkey have been exposed to physical or sexual violence throughout their lives. While this data is 35% in urban life, it is 37.5% in rural life. made these rates, revealed by research, indicate that violence against women is an economic and shows that the education dimension is too effective to be ignored. (Ayşegül Akgül) In their study where they examined femicides in the news of two national newspapers in Turkey between 2014 and 2020, they concluded that 60% of femicide was committed by men. At this point, first of all, patriarchy, which legitimizes men's use of violence to reinforce their power over women and to intimidate and intimidate women, must be destroyed. In the same research, it was determined that 70% of the murders were committed by the husbands of women and 60% of them took place in the woman's home. The home is known as a safe space. It becomes more difficult for women to combat the violence encountered within this safe area.

Research data titled "Women in Statistics" (2022) of the Turkish Statistical Institute (TUIK) shows that the rate of women with higher education degrees in 2021 is 20.9% and men are 25.1%. Additionally, in the same research, it was stated that the place of women in education has increased over the years. However, at this point it is clear that women still do not have an equal reading rate with men. In this regard, it is known that various campaigns have been carried out to bring girls into education. In the same research, TÜİK also found that as women's education level increases, their labor force participation rate increases. While the workforce participation rate of women with higher education degrees was 32.8% in 2021, this rate for men was calculated as 70.3%. In the light of these statistics, although women have closer rates to men in terms of education, the gap between them in workforce participation is gradually widening. Women's financial security will increase their economic independence and self-confidence and help them protect themselves against violence. It is important for women to be able to stand on their own feet, make their own decisions and have control of their lives.

Since its invention, television has come to the fore with aspects such as propaganda and education, and has gradually become an entertainment device by settling into homes. It has become a leading companion, a close friend that helps people relieve the tiredness of the day, and an activity of rest and leisure. According to the research titled "Guide to Understanding Turkey" conducted by Ipsos in (2022), 84% of the society watches television every day. While this rate is considerably high, the contents of the programs broadcast during peak viewing hours are of great importance. Television series are broadcast during these golden hours, called prime time, when viewers are most active (RTUK, 2018). Many TV series produced recently are constructed as if they were "real". The fictional perception of reality given on the screen leaves a psychological impact on the recipients. In TV series, the plot based on "showing women as weak" and "women needing men" penetrates into the

subconscious of the recipients and carries the risk of normalizing violence. In the study conducted by Ünlü et al., (2009), the fact that 96 types of violence were detected in 57 scenes in the most watched TV series broadcast during the golden hours between October and March 2007 shows how widespread the representation of violence is. It has been demonstrated by various studies that violent elements widely covered in traditional media increase actual violence. According to Yağlıcı (2023), violence is scripted with concern for ratings and this can turn into success.

MATERIALS AND METHODS

While the universe of this study consists of television series, the sample is the series "Yalı Çapkını", which started broadcasting on the Star TV channel in 2022. It has been seen that Yalı Çapkını series has attracted the reaction of the audience many times since the first day it started broadcasting, by containing types of violence under the name of "tradition" in all its episodes. However, despite these reactions, the fact that it maintained its most watched position in the rating rates for a while on the day of broadcast was effective in the selection of the sample. On the other hand, it was observed that the audience showed their reactions through the website "şikayetvar.com", Turkey's first complaint platform, which became popular with the easy way to write complaints. Within the scope of the research, 186 complaints written using the keyword "yalı çapkını" on the website in question between 25.09.2022 and 30.12.2023 were examined in order to make sense of audience reactions to scenes of violence. In the review, complaints were thematically categorized and tabulated with the help of qualitative content analysis.

RESULTS

Viewer complaints are explained by dividing into categories such as content, violence, female representation, and advertisements. The table includes the number of complaints and the content of complaints in each category.

Table 1. "Yalı Çapkını" series complaint table

Category	Number of complaints
Contents	95
Violence	35
Advertising	12
Representation of Women	10
Deleted	16
Other	18

Most of the complaints in the content category are that the subject and scenes of the series are against the Turkish social structure and therefore may set a bad example for young people. When we look at the violence category, it is stated that there are too many relevant scenes in the series, they are realistic and disturbing, and they are not suitable for children to watch. The entries in the advertising theme are that the frequency of advertising is high and its duration is long during the broadcast time of the series, and the trailer is not shown next week. The female representation presented in the series was reflected in complaints because it portrayed women passively. Complaints about the representation of women expressed that they were

disturbed because women were portrayed as oppressed and silent characters. Complaints in the deleted category are as stated by the website; It was deleted from the system "at the user's request". Complaints such as sound and music, smart signs, and changing the broadcast date were evaluated under the other category.

The most complained about category was content theme, with a complaint rate of 51%. Complaints about violence constitute only approximately 19% of the complaints about the series. This rate shows that the violent scenes of the series have a significant impact on the audience. In complaints written in this category; It is noteworthy that violence is normalized, encouraged, has a psychological impact, and people with trauma are badly affected.

CONCLUSION

In the study, 186 complaints on the "Şikayetvar" website were analyzed in order to understand how the audience evaluated the violent scenes in the TV series "Yalı Çapkını" broadcast on Star TV. As a result of the analysis, it was determined that the violent scenes in the series were evaluated negatively by the audience. The fact that complaints about violence constituted approximately 19% of the complaints about the series shows that violence has become normalized and its visibility has decreased, and that representations of violence in television series can affect viewers' attitudes towards violence. Television series should include positive, non-violent content instead of violent representations. This will help develop a more positive outlook towards violence in viewers.

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Konu : Akademisyen Temsilcisi

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