BOOK OF ABSTRACTS

The Lebanese American University and the Middle East Partnership Initiative (MEPI) – Tomorrow's Leaders Program present the

4th Annual MEPI Tomorrow's Leaders Graduate Joint Conference, 2024 Edition in collaboration with the American University of Beirut and the American University in Cairo.

Bridging Horizons - Shaping the Future of the MENA Region through Interdisciplinary Research (AUB, AUC, LAU)

An Interdisciplinary Exploration of the MENA Region's Future

Hosted at the Lebanese American University, Beirut/Byblos, Lebanon
(June 3-4, 2024)

FOREWORD

Welcome to the Book of Abstracts for the TLG2024 conference: "Bridging Horizons - Shaping the Future of the MENA Region through Interdisciplinary Research". This collection embodies the spirit of collaboration, innovation, and dedication of the Tomorrow's Leaders Graduate (TLG) students in AUB, AUC and LAU to addressing the pressing challenges facing the MENA region.

As we navigate the complexities of our rapidly changing world, it is evident that interdisciplinary research holds the key to unlocking sustainable solutions. The TLG2024 conference serves as a platform for the TLG students to converge, exchange ideas, and pave the way for a brighter future.

Within these pages, you will find a rich tapestry of abstracts representing a wide array of disciplines and perspectives. Each abstract offers a glimpse into the groundbreaking work being conducted by our TLG students across the MENA region.

I extend my heartfelt gratitude to all the students for their contributions to our conference. Your dedication to advancing knowledge and driving positive change is truly inspiring. I would also like to thank the MEPI team, thesis advisors of our TLG students, TLG teams in the three institutions, scientific committees, and student committee for their invaluable support in making this conference a reality.

Together, we can make a difference.

Warm regards

Dr. Hussein F. Hassan (TLG Academic Director, LAU)

ABOUT THE TOMORROW'S LEADERS GRADUATE (TLG) CONFERENCE:

The TLG Conference is an exciting and highly anticipated event within the MEPI TLG program. It serves as a platform for graduate students to showcase their research findings, exchange ideas, and engage in scholarly discussions. The TLG Conference brings together students, faculty members, and professionals from diverse disciplines, creating a vibrant intellectual community. This conference provides an invaluable opportunity for students to present their research projects, receive constructive feedback, and gain exposure to diverse perspectives.

CONFERENCE THEMES

1. **Economic Resilience and Innovation**
2. **Diversity, Inclusion, and Breaking Gender Barriers**
3. **Peace and Security**
4. **Cultural Dynamics and Identity**
5. **Health and Well-being**
6. **Technology**

ACADEMIC COMMITTEE

Dr. Hussein Hassan
(Lebanese American University, MEPI TLG Academic Director)

Dr. Rabih Talhouk
(American University of Beirut, MEPI TLG Director)

Dr. Ahmed Tolba
(American University in Cairo, MEPI TLG Academic Director)

ORGANIZING COMMITTEE

Dr. Hussein Hassan
(Chairperson of the conference; Lebanese American University, MEPI TLG Academic Director

Ms. Dina Abdulrahman
(Lebanese American University, MEPI TL Executive Director)

Ms. Rita Javaro
(Lebanese American University, MEPI TL Manager)

Ms. Mira Alameddine
(Lebanese American University, MEPI TLG Assistant Program Coordinator)

Mr. Raffi Chilingirian
(Lebanese American University, MEPI TL Lead Communication Officer)

SCIENTIFIC COMMITTEE

The scientific committees, composed of faculty from the three universities, served as reviewers for the abstracts and employed a pre-defined rubric to evaluate all submitted student abstracts.

Experts from LAU

1. Dr. Rima Bahous
2. Dr. Jasmin Lilian Diab
3. Dr. Ali Fakih
4. Dr. Lina Kreidie
5. Dr. Mona Majdalani
6. Dr. Zina Sawaf
7. Dr. Jordan Srour
8. Dr. Sima Tokajian

Experts from AUC

9. Dr. Dina Abdel Fattah
10. Dr. Heba El Deghaidy
11. Dr. Mayyada El Sayed
12. Dr. Helen Rizzo
13. Dr. Nadine Sika

Experts from AUB

14. Dr. Tamer Amin
15. Dr. Ali Chalak
16. Dr. Hani Hassan
17. Dr. Pierre Karam
18. Dr. Samir Mustapha
19. Dr. Rabih Talhouk
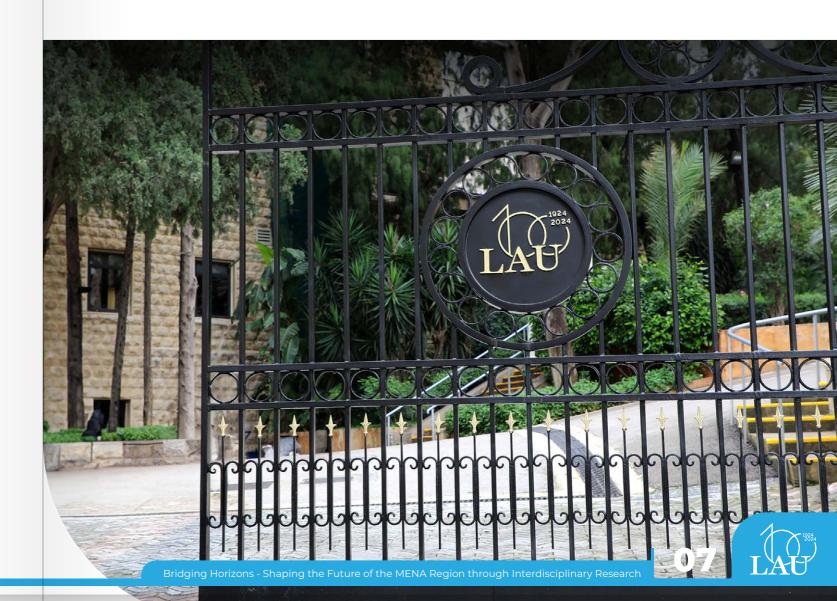
STUDENT COMMITTEE

A student committee facilitated the conference logistics, collaborating with NGOs for the NGO Fair and identifying panelists, ensuring a successful and impactful event.

1. **Ghamdan Al Mahazima, AUB**
2. **Marwa Al Sakkaf, AUB**
3. **Ammar Ammar, AUB**
4. **Nabila Arab, LAU**
5. **Salma Boufoullous, AUC**
6. **Dana El Sammak, LAU**
7. **Dareen Fayyad, LAU**
8. **Ali Jaafar, LAU**
9. **Imen Kekli, LAU**
10. **Hana Lasladj, AUB**
11. **Nour Osman, AUB**

ABSTRACT EDITOR

Nourane Zarour, LAU MEPI TLG Student, in collaboration with the Writing Center - LAU.

We express our sincere appreciation to Nourane Zarour, a dedicated student from LAU's MEPI TLG program, for her diligent efforts as the Abstract Editor. Nourane's collaboration with the Writing Center - LAU ensured the refinement and coherence of the abstracts featured in this conference.

ABSTRACTS

Tomorrow's Leaders
Graduate
4th Joint Conference 2024

ECONOMICS

Bridging the Divide: Exploring the Causal Impact of Financial Inclusion on Economic Empowerment in the MENA Region

DAREEN FAYYAD (LAU)

This study investigates the causal relationship between financial inclusion and the economic empowerment of women and youth in the Middle East and North Africa (MENA) region, a subject of considerable importance but limited empirical exploration. The primary objective is to unravel how access to and utilization of financial services impact key economic outcomes for these demographic groups, providing insights into policy interventions that could enhance their financial and economic well-being. Employing a robust econometric framework, the research utilizes the Two-Stage Least Squares (2SLS) regression model, integrating an instrumental variable (IV) to address potential endogeneity concerns. The analysis is grounded in data sourced from the Global Findex Database, complemented by region-specific surveys and macroeconomic indicators. Key variables of interest include indicators of financial inclusion (like bank account ownership, credit access, savings behavior, and digital payment usage) and economic empowerment measures (such as employment status, income levels, and business ownership). The findings reveal nuanced insights into the dynamics of financial inclusion in the MENA region. Moreover, this study highlights the pivotal role of digital financial services in enhancing access and utilization, particularly among younger demographics. It concludes that improving financial inclusion can be a powerful catalyst for economic empowerment, with substantial implications for policy formulation (...)

Economic Freedom and Income Inequality: Evidence from High- and Middle-Income Countries

MAHMOUD SAEED (AUC)

The transition of many countries from having closed and highly centralized economic systems to more free and open ones over the past few decades has been accompanied by an unprecedented increase in income inequality, which raises questions about whether inequality is an implication of economic freedom or not. Therefore, the objective of this paper is to examine the relationship between economic freedom and income inequality in high- and middle-income countries. Using Fraser's economic freedom index and SWIID's Gini coefficient for disposable income, we employ a panel of 67 countries over the time period between 2017 and 2007 and conduct a comparative empirical analysis using a fixed effects model (FE), a fixed effects model with Driscoll and Kraay's standard errors, and two-step system generalized methods of moments (GMM) estimators to test the above relationship. Empirical findings indicate a negative relationship between economic freedom and income inequality across all specifications, although not all dimensions of economic freedom are significantly related to inequality. Further investigation reveals that all economic freedom dimensions are significantly and negatively related to inequality in high-income countries, while the dimensions of the legal system, property rights, and sound money practices do not significantly relate to inequality in middle-income countries. The findings are robust to alternative models, variable choice, and sample size.

BUSINESS

Skills Rise: Empowering Lebanon's Youth to Stem Brain Drain

FAHID ABU-SALAH, INAYA ATALLAH (AUB)

Brain Drain, as defined by the National Institute of Health, involves the migration of skilled individuals seeking improved living conditions, quality of life, higher salaries, access to advanced technology, and political stability. This trend is primarily observed among young, well-educated, and healthy individuals, driven by aspirations for higher education and economic advancement. Moreover, research by the International Labor Organization (ILO) reveals that the unemployment rate is higher among youth with advanced educational levels in low-income and lower-middle-income countries. These knowledge gaps entail long-term risks, including the potential for economic stagnation in countries of origin due to the depletion of human capital. Youth emigration currently counts for 70% in Lebanon (Nahas, 2020). Shedding light on this issue, Lebanon is at risk of Brain Drain as 61% of those wanting to emigrate are with a college education. Data science has emerged as a growing job market, experiencing a shortage due to high demand and low supply, especially after the rapid progress of digital transformation post-COVID-19. (...)

Exploring Global Climate Policies and the Pursuit of a Zero Emission Economy

OUSSAMA BELAMRI (LAU)

This paper discusses an existential global issue that many people tend to ignore or believe does not directly affect them. In this paper, we argue that humans, since their existence on earth, have been in constant movement. The migration out of Africa was the first step in human migration, but humanity did not embark on this journey solely to explore distant lands. The scarcity of resources, such as plant-based food and water, has been a driving force behind human mobility, leading up to the beginning of the 'Anthropocene Epoch.' The onset of this era marks a significant impact of human activities on the planet's climate and ecosystems. It is also an era where a few groups of humans enjoy relative safety from wars faced by others, yet we are all under the threat imposed by global warming and climate change. In the following sections, we unpack several climate policies adopted by different countries and discuss them from a political perspective. Finally, we address the zero-emission economy, a target announced by more than 140 countries and endorsed by the United Nations as a Net Zero Coalition. Even major polluters such as China, the United States, India, and the European Union have committed to transitioning into a green economy by reducing greenhouse gas emissions to as close to zero as possible.

BUSINESS

Building Effective Leaders: Exposing the Seven Habits

HADEEL EL JUHAYIM (LAU)

The COVID-19 pandemic and the wider Lebanese context have changed the dynamics of education and could be the reason students are not achieving as well as before, so it is vital to intervene by teaching them life-long skills and habits that could aid in their personal growth and academic performance. Research has shown that the majority of children, after the pandemic, became more dependent, had shorter attention spans, and were less active. In Lebanon, this situation is exacerbated by a multifaceted crisis, which may contribute to low academic performance. There is therefore a need for immediate intervention to decrease the long-term consequences for young people's future and success. Moreover, it becomes crucial to develop students' leadership skills to fit the rapidly changing nature of the modern world. Drawing from a theoretical framework, this paper examines effective teaching practices aimed at fostering leadership principles among students aged between 14 and 16 in Lebanon, inspired by the "Seven Habits of Highly Effective People" book written by Stephen Covey that teaches readers, of all ages, habits that are significant for their personal growth and self-leadership. This comprehensive teaching plan employs diverse and inclusive lessons and different materials, methods, and activities, including presentations, visuals, experiential learning, group and individual work, discussions, projects appropriate to their age group, reading, listening, and physical activities, to facilitate holistic personal development. The teaching plan was taught to secondary students in Lebanon over the course of three to four weeks. At the end of the unit plan, a survey was completed by the students, which aimed to help them reflect on their journey and learning experience, the current changes in their attitudes, and their future plans. Results indicate that students can enhance their leadership capacities (…)

How does an enabling business environment promote job creation? The case of Saudi Arabia

FARAH YOUNES (LAU)

This study focuses on the critical relationship between an enabling business environment and job creation in Saudi Arabia as a result of the economic upheavals caused by the 2008-09 financial crisis and falling oil prices. Saudi Vision 2030, which recognizes the need for economic diversification, intends to transform the country into a knowledge-based economy. The study expands on previous research by diving into the dynamics of job creation in Saudi Arabia. Using data from the World Bank Enterprise Surveys, the study focuses on 1,573 Saudi enterprises between September 2022 and April 2023. The study applies an ordered probit model to assess the impact of factors such as power and financial access issues on job development, using a categorical dependent variable representing annual employment growth. The study contributes valuable insights tailored to the economic, regulatory, and cultural nuances of Saudi Arabia, aiming to inform evidence-based policymaking and strategic economic planning for sustainable development in the region, with the expectation that overcoming these constraints will correlate with increased employment growth.

MIGRATION

UNHCR's Representation of Syrian Refugees in 'Every Second Counts' Campaign: Syrian Refugee Perspective

MARAH ABU MUTAWE (AUC)

Representation is not just an opinion; it is the recreation of realities, facts, and stories that
encourage receivers, who are readers and viewers, to build images and perceptions of a certain topic,objects, events, and human beings. Studying the representation of refugees in the media, UN agencies,and international organizations has been the main focus for many scholars for decades. However, more information is needed about refugees' perspectives on captured and videographed refugees by UN agencies and international organizations. This research engages with different studies on the representation of Syrian refugees in UNHCR's online fundraising campaign "Every Second Counts." This study investigates how UNHCR represents Syrian refugees in the "Every Second Counts" fundraising campaign and what are the perspectives of Syrian refugees living in Jordan about the campaign. Moreover, this research used Hall's encoding/decoding model to analyze the representation encoded by UNHCR and decoded by the Syrian refugee. Therefore, qualitative methods such as in-depth interviews, semi-structured interviews, and discourse analysis were used to understand 1) What kind of meanings are developed by UNHCR while using Syrian refugees' photos and videos in the campaign, alongside the captions used to describe these visual elements, and 2) What are the perspectives of Syrian refugees living in Jordan, mainly in Amman and Irbid about UNHCR's fundraising campaign "Every Second Counts". This study found that UNHCR mostly represented Syrian refugees as vulnerable victims with no agency who are dependent on UNHCR and donors which is considered a dehumanizing representation. (...)

Navigating Resilience: An Interdisciplinary Study of Palestinian Refugee Communities comparing those in Different Refugees Camps in Lebanon

NABILA ARAB (LAU)

This research is dedicated to illuminating the nuanced dynamics of resilience within Palestinian refugee communities between different refugee camps in South Lebanon, Beirut, the North and Bekaa. Adopting a targeted interdisciplinary approach, the study aims to unravel the specific sociological, psychological, and economic dimensions that shape resilience among Palestinian refugees in these regions. The primary objective is to comprehensively understand how Palestinian refugees in camps around Lebanon have been navigating challenges, building social capitals, and contributing to their host societies in the Lebanese cities. The study seeks to identify patterns, dynamics, and success factors unique to these communities, with a focus on fostering effective integration and support systems. To achieve these objectives, the research will employ a triangulation of methods. Qualitative interviews or self-aided surveys will be conducted to capture the lived experiences of Palestinian refugees (Young Youth) shedding light on their coping mechanisms and community initiatives. Quantitative surveys will be utilized to quantify resilience factors, providing a measurable understanding of resilience dynamics. Additionally, economic analyses will assess the socio-economic and psychological impact of resilient behaviours specific to the Palestinian refugee context in the different camps where they are based, and that will be according to the interviews and surveys. (...)

INTERNATIONAL AFFAIRS

The Inclusion of Women in Peacebuilding in Zones of Conflict: The Case Study of South Sudan

SOUFIANE EL HAMRY (LAU)

In the turbulent landscape of conflict and post-conflict countries and societies, the critical contribution of women in peacebuilding processes often remains hidden beneath the shadow of patriarchal norms and power dynamics. Various studies confirmed that despite the importance of women in fostering sustainable peace on the ground, their involvement remains limited, and their voices are often marginalized, especially at the table of negotiation. This policy paper delves into the role women play in peacebuilding efforts within the context of Eastern Africa, and particularly South Sudan. Adopting a qualitative methodological approach and a feminist theoretical framework, the study synthesizes existing scholarly work to include books, articles, and reports. This paper explores the barriers and underlying causes that impede the effective inclusion of women in negotiations and peacebuilding, within the framework of UNSCR 1325. The study integrates the cultural feminist theory and the feminist power dominance theory, aiming to provide foundational policy recommendations and interventional strategies for an internationally recognized and comprehensive framework addressing the challenges faced by women, particularly in South Sudan, within a region known for its prolonged and multiple conflicts. The proposed solutions underscore the need for targeted gender-sensitive policies, capacity-building programs, and advocacy efforts to empower women and amplify their contributions to peacebuilding processes in South Sudan and Eastern Africa in general. The holistic goal is to foster a more inclusive and sustainable peace process that reflects the diverse perspectives and experiences (...)

Mutual Perceptions of Syrian Refugees and Host Communities in Turkey between the Pre- and Post-Earthquake Eras

KEVORK YACOUBIAN (LAU)

Over the past decade, the Syrian refugee crisis has become an arena of extensive interest and analysis for scholars of migration specifically. Mass displacements have always caused alterations within the socioeconomic makeup of the countries affected by such situations. Regarding the Syrian crisis, countries such as Lebanon, Jordan, and Turkey have been extensively affected by the flow of refugees and asylum seekers into their territories, fleeing conflict and persecution. This paper intends to analyze the divergences between mutual perceptions of Syrian refugees and host Turkish citizens and their evolution between the pre-earthquake and post-earthquake eras. To this end, the paper intends to adopt the literature review as a background for refugeehood and the general situation of Syrian refugees within Turkey. Moreover, the paper employs the Syrian Barometer Survey conducted between 2017 and 2022 to present and analyze trends of mutual perceptions between both groups. Regarding the post-earthquake era, the paper analyzes journal and newspaper articles to frame changes in behavior and perceptions. As such, the paper employs secondary sources and quantitative analysis to test the following hypothesis: Syrian refugees and host Turkish communities have had a consistent trend of worsening perceptions vis-à-vis each other, and the earthquake did not alter, but rather, accelerate this trend that has developed over the years, making it more hostile and violent.

HEALTH AND WELL-BEING

Plant-Based Remedies and the Distribution of Medicinal Plants in the Fertile Crescent

RAWAN AL-SAMARRAI (AUB)

This paper aims to document the distribution and uses of medicinal plants in the Fertile Crescent region, with a focus on traditional Arabic and Islamic medicine (TAIM) and complementary and alternative medicine (CAM). The study employs a scoping review methodology to collect and analyze available documents on the topic, with inclusion criteria limited to Arabic and English documents from Iraq, Jordan, Lebanon, Palestine, and Syria. In addition, the study will incorporate GIS imaging to map the location of the plants. The research questions include the documented medicinal plants in the region, the unique or threatened natural habitats of native medicinal plants, the extent of commercialization of medicinal plants, and the conservation status of these plants. Moreover, the study also discusses the urgent need to document plant species due to the reliance on CAM in developing countries and the overharvesting and vanishing of medicinal plant species. A database will also be established to systematically document the medicinal plants in the Fertile Crescent area. Furthermore, the integration of GIS imaging and a comprehensive database will provide valuable insights into the spatial distribution and conservation of medicinal plants in the Fertile Crescent region. The paper concludes with a discussion of the ecological distribution of medicinal plants and their conservation status, the importance of sustainable cultivation protocols, and the need for more research on cultivation and conservation efforts.

The Psychological and Social Effects of COVID-19 Pandemic on Health Care Workers in Lebanon

NORMA NASER ALDEEN (AUC)

In recent years, Lebanon has experienced a myriad of natural and human-made challenges that left severe consequences on its residents. Among these challenges, the COVID-19 pandemic affected different groups, including Health Care Workers (HCWs), who were at the forefront of serving, protecting, and saving people from the virus, while being continuously exposed to it, which can negatively affect their physical, social, and psychological well-being. This study sought to examine the psychological and social effects of the COVID-19 pandemic on HCWs in Lebanon, to highlight the difficulties they may experience, which can help inform potential solutions for current, and future similar events. An interdisciplinary approach was used by adopting psychometric scales, in addition to utilizing a public health lens, addressing public health concerns, and acknowledging the intersection of various players that affect the participants' psychosocial status. A total of 380 participants responded to a cross-sectional online survey that constituted the Multidimensional Scale of Perceived Social Support (MSPSS), the Patient Health Questionnaire (PHQ-9), the Generalized Anxiety Disorder Scale (GAD-7), the Impact of Event Scale-Revised (IES-R), burnout as a single-item measure, and the Pittsburgh Sleep Quality Index (PSQI). The main findings indicate that high levels of depression (39.5%), anxiety (37.6%), PTSD (42.1%), burnout (33.1%), and poor quality of sleep (34%) were reported across the sample. Levels of perceived social support were relatively similar across the sample. Years of work experience were strongly associated with symptoms of psychological distress. (…)

HEALTH AND WELL-BEING

Transformative Strategies in Brain Cancer: [HuArgI(Co)-PEG5000] Unveils a Novel Therapeutic Approach

MAHA SHAHEEN (LAU)

Glioblastoma (GBM) is a devastating malignancy with considerable implications for global public health. According to the Central Brain Tumor Registry of the United States (CBTRUS), glioblastoma is the most prevalent malignant brain tumor, comprising 14.2% of all brain tumors and 50.1% of malignant tumors. In 2022, an estimated 93,470 new cases of malignant and non-malignant brain and CNS tumors are expected in the US, with glioblastoma showing a higher incidence in males. The five-year relative survival rate for glioblastoma averages at 35.7%. Glioblastoma, comprising 59.2% of cases, stands out as the most prevalent subtype, which represents a lethal danger to patients and a crucial burden on the healthcare system that requires innovative approaches in targeting therapies. This paper, therefore, investigates the potential of human recombinant arginase ([HuArgI(Co)-PEG5000]) as a targeted therapeutic for inducing arginine depletion in brain cancer, specifically Glioblastoma Multiforme (GBM) cells, with a focus on triggering ferroptosis, a novel autophagy-mediated cell death pathway. Results demonstrate that [HuArgI(Co)-PEG5000] induces ROS-mediated cytotoxicity in GBM cells, a response mitigated by ROS scavenging using NAC. Moreover, analysis of key regulatory proteins associated with iron homeostasis and oxidative stress defenses suggests altered iron distribution, impairing the antioxidant system in treated cells. Our findings underscore the potential of [HuArgI(Co)-PEG5000] in promoting ferroptosis in GBM cells, offering insights into targeted therapies for this challenging brain cancer. In conclusion, this research represents an innovative approach to understanding and treating GBM.

INTERNATIONAL AFFAIRS

Heavy Metal Contamination in Agricultural Soils in Lebanon

REEM CHAKIK (AUB)

A continuous assessment of heavy metals' (HMs) levels in agricultural soils on a national level is lacking in Lebanon, taking into account the continuous pollution forms. Recently, hyperspectral imaging has emerged as a sensitive and rapid approach to the assessment of soil contamination. Accordingly, the proposed research aims at assessing HMs contamination in major agricultural areas in Lebanon and evaluating the effectiveness of using HSI in the detection of HMs levels. Additionally, the study aimed at assessing the use of HSI and machine learning for the classification of soil. Soil samples were collected from different locations across the country and analyzed for Copper, Nickel, Lead, Cadmium, Chromium and Zinc using Atomic Absorption Spectrophotometry. The collected soil samples were also scanned using the Hyspex SWIR-384 to study the soil spectral behavior, and developed machine learning (ML) algorithms were applied to quantify the HMs present. The performance of ML algorithms in defining different soil types based on their spectral characteristics was evaluated. The findings from the study revealed alarming contamination with Ni and Cd in different agricultural areas, exceeding the EU limits in soils in 30% and 18% of the tested samples, respectively. Zinc and copper were below the EU limits, and no soil pollution was detected in the case of Pb and Cr which were below the EU limits. HSI scans showed that the clayey content and organic matter significantly decrease light reflectance. Mostly, water absorption bands and adsorption of HMs on iron oxides and organic matter were observed. HSI was not successful in the quantification of HMs as the models exhibited low accuracy in predicting HM concentrations, namely due to the relatively low concentrations measured in these soils. However, HSI and ML were successfully used in soil classification, with the Neural Network model showing the best accuracy in predicting the soil type (R2=0.805).

Use of a Big Data Approach in Guiding Climate Adaptation and Mitigation Policies and Interventions

MARIA MOUZANNAR (AUB)

Despite the rise in global environmental action in the past decades, CO_2 emissions are expected to progressively continue uphill, with deforestation swiping millions of hectares annually, hence destroying a major CO_2 sink. Moreover, many of the past controversies on climate change arose due to contentious, differing, disputed data or its nonexistence, but big data could come to solve this challenge. Today, big data can be used for various climate interventions. The United Nations has clearly indicated that there is a role for big data in fighting climate change and other key global issues underlying the Sustainable Development Goals. But while the role of big data in many climate action areas has become evident, a clear gap exists in understanding its ability to shape climate policy. Hence, given the rapidly expanding positive impact and influence of big data, it is thus serious to investigate its implications in the climate policy realm. Hence, this work examines the role of big climate data in guiding national climate policymaking, specifically the Paris Agreement's Nationally Determined Contributions (NDCs). Methodologically, the study followed a mixed-methods approach, using both quantitative and qualitative data and the analysis of both primary and secondary data sources. Primary data analysis consisted of semi-structured interviews with climate policy experts who were selected for their expertise using purposive sampling. The interviews allowed us to understand perspectives on the ability of big climate databases to reflect NDCs and provide support in their design and implementation. Secondary data analysis involved the evaluation of selected global climate NDC databases by developing an evaluation tool from relevant sources from the literature, including peer-reviewed scientific articles, climate policy documents, and international reports. For the purpose of feasibility(...)

INTER-
DISCIPLINARY
RESEARCH

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BOOK OF ABSTRACTS

INTERNATIONAL AFFAIRS

Exploring the Influence of Food Consumption on Schoolchildren's Food Choices using A Gamified Choice Experiment in Greater Beirut, Lebanon

NOUR OSMAN (AUB)

Children's food choices are risk factors for the development of several non-communicable diseases (NCDs). In Lebanon, socio-economic crises have led to a shift in dietary patterns towards more processed and unhealthy foods, increasing the risk of NCDs among children. Thus, the objective of this project is to examine how different food consumption exposures, classified into the 4 NOVA classifications (unprocessed food, processed culinary ingredients, processed food, and ultra-processed food), influence food choices among Lebanese children after the crises. By understanding the impact of these food categories on children's dietary preferences, we can develop targeted interventions to promote healthier eating habits and reduce the risk of NCDs in this vulnerable population. The study used a stratified random sample of primary schools in Greater Beirut, and children were randomly selected from grades 4-5-6 in each school. Data were collected through different methods, including structured questionnaires and discrete choice experiments (DCE) to assess children's food choices. Additionally, wearable cameras were used specifically to capture the real food consumption exposure of grade 6 children at home and on their way to school. Out of the 47 selected schools, a total of 2098 children were eligible, of which 177 were selected for the study. Analysis indicated that children with higher exposure to healthy foods, particularly unprocessed ones, were more likely to choose healthier options. Furthermore, the analysis of unhealthy food options showed minimal significance in relation to exposure to ultra-processed foods influencing children's choices towards unhealthy options. The findings underscore the importance of promoting exposure to healthier food consumption both at home and on the way to school. (...)

An Effectiveness-Implementation Hybrid Trial in Lebanon to Test Evidence-Based Tobacco Cessation Interventions in Primary Care in a Low-Resource Setting: a Study Protocol

SARA TOHME (LAU)

Tobacco use remains the leading cause of preventable disease, disability, and death globally. Lebanon has an exceptionally high tobacco use burden. As per a recent national household survey, 35% of adults are current cigarette smokers, 39% are waterpipe smokers, and 4% are dual smokers. Additionally, lung cancer incidence rate is recorded as highest for females and the second highest for males in the Middle East and North Africa region. To date, population-level tobacco dependence treatment services are not integrated as routine part of primary care in Lebanon, as is the case in other low-resource settings. Our objective is to evaluate the comparative effectiveness of promising multi-component interventions for implementing evidence-based tobacco treatment in Lebanon's national system of primary healthcare centers. We will conduct a 3-arm group-randomized trial comparing (1) Ask about tobacco use; Advise to quit; Assist with brief counseling (AAA) as standard care; (2) Ask; Advise; Connect to phone-based counseling (AAC); and (3) AAC+ nicotine replacement therapy (NRT). Our hypothesis is that connecting patients to phone-based counseling with NRT is the most effective alternative. We hypothesize that i) implementing AAA with providers will foster a supportive care climate for quit attempts, increase patient knowledge about the smoking risks and cessation benefits, and modify social norms for tobacco use among smokers in Lebanon; ii) connecting smokers to phone-based behavioral counseling using AAC will increase the perceived benefits of cessation and improve norms, and promote self-efficacy among smokers. (...)

INTERNATIONAL AFFAIRS

Gender, diversity, and equality Unveiling Gender in Text: Advanced Approaches in Language Model Analysis

NOUR AL BIDEWE (AUB)

This research investigates the complex task of gender detection in text analysis, focusing on identifying an author's gender through linguistic and stylistic analysis. The study emphasizes the role of gender detection in enhancing the precision and relevance of information processing systems, which is pivotal for more personalized content strategies and combating gender biases in various sectors such as social media and AI-driven analytics. The research encompasses a comprehensive evaluation of various methodologies, including an array of preprocessing techniques and feature selection strategies, along with the efficacy of both traditional and large language models like BERT, especially at the tweet level. The study conducts an exhaustive evaluation of diverse methodologies, encompassing a range of preprocessing techniques and feature selection strategies, and assesses the effectiveness of both traditional and advanced language models like BERT, particularly in analyzing tweets. Our study's key findings show that username-based data splitting in social media, as opposed to random splitting, enhances model performance and generalization, and prevents data leakage. Integrating word and character N-Grams, along with combining linguistic and textual features, proved highly effective. BERT emerged as a superior performer among large language models, though it did not outperform traditional models. This work not only advances the understanding of gender detection but also contributes significantly to the development of more sophisticated and equitable text analysis tools in the field of computational linguistics.

Religiosity and Attitudes toward Homosexuality: Examining the Correlation among the Lebanese Community

DANA EL SAMMAK (LAU)

The correlation between religiosity and the prevalence of homophobic attitudes has been thoroughly investigated; however, most of the sstudies have largely focused on participants living in Western countries. To address this gap, a survey was conducted to study the participants' (N=295) attitudes toward religion and homosexuality in Lebanon. The results showed that higher levels of individual predicted higher levels of homonegativity. This study also revealed several other predictors, such as religious affiliation, gender, age, and levels of education. In addition to contributing to the literature, the current research provides insights into the global impact of religiosity on homophobic attitudes, helps inform policies that promote tolerance and inclusivity in communities with high levels of religiosity, and engages communities in open dialogues that challenge homophobic attitudes.

INTERNATIONAL AFFAIRS

Queering Palestine: On Being Queer in Occupied Palestine

ASSIL FARES (LAU)

This paper examines the complex landscape faced by queer Palestinians within the context of Israel's deliberate portrayal of its state as queer-friendly—a strategy commonly known as "pinkwashing." Beyond serving as a diversionary tactic, this pinkwashing narrative operates as an occupational tool, deflecting attention from the grave human rights violations systematically perpetrated against indigenous Palestinians. Situating the study within the context of an apartheid state, it critically explores the experiences of queer Palestinians amidst the ongoing Israeli occupation in Palestine. This investigation navigates the contrasting dynamics of Israel's pinkwashing strategy and the societal "whitewashing" within Palestinian communities. Focusing on the intricate intersections of gender, sexuality, and nationalism, this research sheds light on the multifaceted challenges faced by queer Palestinians residing in occupied territories. Utilizing a feminist and anti-colonial theoretical framework, this paper conducts a comprehensive literature review, encompassing narratives and testimonies of queer Palestinians detailing their encounters with the occupation's studied tactics. Through these firsthand accounts, the paper aims to illuminate the intersectionality of sexuality with nationality, striving to construct a nuanced and contextualized understanding of sexual identities that diverges from the dominant Western discourse. By examining the narratives of queer Palestinians and their encounters within the occupation, this research aims to contribute to a more profound understanding of the intricate web of challenges faced by this marginalized community in Palestine's complex socio-political landscape.

COVID-19 and Labor Shortage in France: Exploring the Contribution of Tunisian Migrant Workers in bridging the Labor Shortage

SANA GASMI (AUC)

The thesis research relied on desk review which was complemented by 11 in-depth interviews with nine Tunisian migrant workers and two Tunisian migration experts. The research examined the labor shortage in France during the pandemic and the extent to which Tunisian migrant workers managed to bridge the labor shortage relying on the Segmented Labor Market Theory, which was originally developed by Piore (1979), and the two concepts: system effects and systemic resilience. Findings indicate that the COVID-19 pandemic unveiled several weaknesses in the French labor market system, including the acute labor shortage. Faced by a labor shortage, France turned to migrant workers to meet its labor demand, which became problematic with border closures. Tunisian migrant workers, the focus of the thesis, contributed to bridging the labor shortage in France. They actively participated in labor shortage-affected occupations and essential occupations. However, findings indicate that there were some differences that were experienced by Tunisian migrant workers, mainly in terms of recruitment procedures. Due to the high labor demand experienced during the COVID-19 pandemic in the French labor market, Tunisian migrant workers who worked in essential occupations had facilitated recruitment procedures, while Tunisian migrant workers who worked in non-essential occupations had accustomed recruitment procedures. In general, Tunisian migrant workers contributed to building systemic resilience in France by offering flexibility in terms of employment and supporting the growth of networks that continue to facilitate meeting labor demand.

INTERNATIONAL AFFAIRS

Managing Communal Differences: The Case of Iraq A comparative study between Belgium and Iraq Post 2003

SHATOO BAKIR (LAU)

This research aims to analyze the difficulties that lie in managing different communities and how these groups can learn to share power and resolve conflicts by finding common interests rather than accentuating the differences that set them apart. A sectarian defined level of social and political notions in Iraq has set the country apart for too long. What was achievable for another federal state in Europe can be achievable in Iraq as well, given the right tools and mindset to implement changes and policies. The literature of communitarianism, double movement, and consociationalism provides insight into what Iraq has been and how it persists to go through in light of these different communities, divided along cultural and religious lines. This consociationalism guarantees collective security and coexistence while also undermining the threats of repression by establishing a solid and firm power sharing agreement between groups. The paper will then shift to explore the case of Belgium as a federal state that has been rather auspicious in managing the community differences centered around identity politics and the different communities and regions that are integral to its establishment. The aim is to extract good governance and conflict management to design a record of good practices that can be utilized in Iraq. The comparative study of two similarly structured states with variant political systems and approaches, Belgium and Iraq, has allowed for the space to integrate the ideas and examples from the collective community of Belgium into the divided sectarian state of Iraq. The findings identify the political, social, and economic areas where the different communities in Iraq can learn to share power and co-exist in order to mitigate the conflicts that set them apart (…)

Examining Gender Bias Inherited by ChatGPT

JANA CHAZBECK (AUB)

In this drastically evolving digital era, textual content production heavily relies on Large Language Models. These models are prone to inherit and thus propagate various forms of stereotypes and gender bias from their training corpus, which has harmful consequences on the worldwide population, such as loss of human potential, aggressive behaviors, biased mental imagery, and unfair labor force participation. Therefore, this thesis is focused on evaluating gender bias in the responses of one of the most recent and popular LLMs, ChatGPT. We examined occupational and semantic bias in three common tasks of ChatGPT as well as in the embedding task of the Ada-V2 model. After that, we finetuned ChatGPT on bias detection for three types of bias: sexism, dehumanization, and generic bias. The finetuned versions outperformed the original model as well as other popular LLMs in bias detection. We were also able to highlight two major weaknesses in ChatGPT's learning capabilities as well as reduce the gender gaps in the model's responses. This research built a strong basis for future work to ensure the safe and valuable use of recent AI tools like ChatGPT.

INTERNATIONAL AFFAIRS

Generational Shifts in Gender Beliefs within Lebanese Society

NOURA SALAM (LAU)

This study investigates the intergenerational transmission of gender beliefs and norms in Lebanon, focusing on potential shifts across three distinct generational groups. Utilizing a mixed-methods approach, the research combines content analysis of existing literature with semi-structured interviews involving 18 participants from three different generations, including three men and three women from each generation. The primary aim is to explore whether gender beliefs are static or evolving within the Lebanese societal context. The study addresses a significant gap in the literature by examining the dynamics of gender perceptions across generations, contributing to a deeper understanding of how these beliefs are shaped and transmitted. It further explores the factors influencing changes in gender beliefs and their impact on gender equity and women's empowerment in Lebanon. The research findings are expected to offer valuable insights into the complex interplay of generational shifts and gender beliefs, potentially informing social and policy interventions targeting gender inequality. The research reveals that while traditional gender norms persist, there are signs of evolving attitudes, particularly among younger generations, driven by increased exposure to globalized perspectives and education. Moreover, the findings offer insights into social change.

Domestic Violence and Masculinity

RANA SALEH (LAU)

This research paper delves into the cultural roots of domestic violence in Egypt and Mexico. The project explains masculine and feminine notions from a cultural and societal perspective using Judith Butler's gender performativity. The paper shows the implication of the latter in understanding gender and masculinity and how the performance of masculinity is related to the structures and societal expectations of patriarchy that may lead to instances of domestic violence. First, the paper explains the notions of masculinity and femininity and how they are constructed to highlight gender inequalities in interactions. It explores how men could use compensatory violence to regain their sense of manhood, reinforcing hegemonic masculinity and patriarchy. The research attempts to answer the question: What role does masculinity play in the perpetuation of domestic violence within heterosexual relationships, considering cultural, social, and individual factors? I apply a qualitative approach through a scoping review of existing literature, particularly the book by Farha Ghannam entitled Live and Die Like a Man, which focuses on stereotypes of masculinity in urban Egypt. The notion of machismo in Mexico is also investigated in the book "The Meanings of Macho: Being a Man in Mexico City," written by Matthew. C. Gutmann. The research focuses on fear and loathing in male violence, concluding that masculinity plays a significant role in domestic violence and is greatly influenced by the prevalent and dominant culture which formulates habits and traditions in society. These traditions are usually marked by inequality, leading to the superiority of one sex over another, usually men, which can result in violence between men and women.

INTERNATIONAL AFFAIRS

Gender, War, and Humanitarian Law: A Feminist Analysis of the Israel-Hamas Conflict

NAIMA DAMS (AUC)

This article delves into the complex interplay between gender and war, with a specific focus on the Israel-Hamas conflict. The first section examines the reciprocal relationship between gender dynamics and the war system, probing the question: Does gender shape the war system and vice versa? Moving forward, the study delves into the gendered impact of war, honing in on the experiences of Palestinian women during the Israeli-Hamas conflict. It explores how the conflict not only exacerbates existing gender roles but also reinforces hierarchical structures within the affected communities. The research takes a turn later by exploring the implications of humanitarian international law through a feminist lens. A critique of this legal framework unfolds, shedding light on its efficacy in addressing the challenges faced by women in conflict zones. This article contributes to the ongoing discourse on the intersectionality of gender and conflict, offering a nuanced feminist perspective on the Israel-Hamas War. By intertwining empirical observations with feminist legal analysis, it endeavors to prompt critical reflections on the adequacy of humanitarian international law in safeguarding the rights and well-being of women affected by armed conflicts.

Negotiating Power: A Study of Syrian Women's Daily Life in Zarqa

FARAH QONAISH (AUC)

This research delves into the repercussions of the Arab Spring in 2011, particularly in Syria, resulting in prolonged conflict and widespread displacements. Over the past decade, the number of Syrian refugees has steadily risen, with a significant portion seeking refuge in neighboring Jordan. Approximately 1.27 million Syrians have found asylum in the country, challenging the common perception that the majority (87%) reside independently in urban areas, particularly cities like Mafraq, Irbid, Zarqa, and Amman, rather than refugee camps. The study focuses on Zarqa; it aims to scrutinize the impact of displacement on gender roles within Zarqa's Syrian refugee community, considering economic challenges, high unemployment rates, and reliance on informal employment. Notably, informal employment is prevalent, with both Syrian men and women engaging in such work due to difficulties in obtaining work permits and a lack of capital for formal investment. The research explores interventions by governmental programs like the Jordan Compact and humanitarian organizations to enhance economic opportunities for Syrian refugees. It acknowledges the focus on women in these programs, given their higher accessibility due to men predominantly working in the informal sector. Furthermore, the study recognizes the need for a holistic understanding of gender roles, emphasizing the importance of examining roles within families beyond individual women. This shall be accomplished through ethnographic research conducted in Zarqa within the Syrian community, assessing changes post-displacement in terms of employment status, responsibilities, and rights. In-depth conversations and focus groups will be conducted as well to provide a wholistic view to fill gaps in scholarly work by exploring the perspectives of Syrian refugee men on masculinity before and after displacement(...)

EDUCATION

Teachers' Perception of the Factors that Challenge and Advance Music Education in K-12 Schools: A Qualitative Study in Lebanon

KHALDOUN ABOU DARGHAM (AUC)

Music education plays a crucial role in developing students on the individual level and societies on the communal level. Despite its benefits for the human brain, student learning, physical and mental health, and its contribution to culture and the creative economy, music education still faces challenges that prevent it from fulfilling its potential. Due to scant research on the factors that impact music education in Lebanon, this phenomenological study explored the perceptions of six K-12 music teachers in Mount Lebanon through in-depth interviews regarding the issue. Drawing upon constructivist and humanistic learning theories, the research investigated how the Lebanese society influences student attitudes towards music learning. Specifically, the study explored teachers' perceptions of the factors that prevent music education from reaching its full potential in Lebanese private schools and provided insights on how it can be improved. It also examined how fostering creativity, innovation, individuality, and freedom inside the classroom can advance music education. The research findings highlighted that regardless of the teachers' vehement belief in the importance and impact of music education, institutional and socio-cultural challenges have been obstructing an ideal reality from forming in Lebanon. In light of these findings, four main themes were drawn: The Role of Music Education in Lebanese Society, Socio-Cultural Barriers, Institutional Barriers, and Student Motivation. Finally, the researcher discussed how these themes are interrelated and shed light on how teachers in Lebanon cope with external challenges in creative ways inside the classroom to inspire change.

Educational Experiences of Students with Visual Impairments in Higher Education: A Case Study of a Private University

GHADEER ALGHURABI (AUC)

To uncover possible gaps between policies and the lived realities of these students, this research focuses on the policies and experiences of disabled students at the American University in Cairo (AUC), Egypt. This qualitative case study aims to investigate possible discrepancies between AUC's policies and students' educational experiences and examine the policies for students with disabilities. It also seeks to understand how students with visual impairments view their educational experiences. The research design used in the study is phenomenology research, and the data-gathering methods include policy analysis and interviews. The full examination of AUC's policies through document policy analysis centers on providing accommodations for students with physical and sensory impairments. In-depth semi-structured interviews are also carried out with 12 specifically selected participants, comprising male and female special needs pupils. Participants' opinions on the policies and educational experiences of the university are investigated through the interviews. According to preliminary results, there are still gaps between rules and lived experiences, even though higher education institutions—including AUC—have progressed in accommodating students with disabilities. Obstacles continue to exist, including curriculum modification, instructional strategies, and evaluation procedures. The survey also emphasizes how underrepresented students with disabilities are in higher education and how urgent it is to close the inequalities that currently exist. By focusing on the understudied topic of students with disabilities in higher.

EDUCATION

Experiences of Female Academic Leaders in Higher Education: A Case Study in Cairo

SABOUR AMINA (AUC)

Similar to many contexts, the gender gap in higher education leadership persists universally. Women are still underrepresented despite the contributions they demonstrate in leading higher education institutions. This study aims at contributing to the area of research in this regard by exploring the experiences of female academic leaders in Cairo, Egypt. It specifically highlights the challenges these women face, and how they manage to overcome them. Using a qualitative approach to deeply explore the phenomenon, ten interviews were conducted with female leaders at the American University in Cairo. Looking through the lens of intersectional feminism, under the umbrella of neo-patriarchy theory, this research explores the different indicators that shape and influence the experiences of these women while examining the interplay of the socio-cultural, professional, and institutional obstacles these women must deal with. The study's findings shed light on the different intersectional indicators that appear to influence female leadership in higher education when coined with gender. This last appears to be a significant determinant. The paper concludes that an intersectional perspective is needed by higher education institutions to improve the situation of female leaders in academia.

School Feeding and Educational Challenges in the MENA Region

FATIMA ZAHRAE YADDAR, HANA LASLADJ, MOHAMED EMARA, AMMAR AMMAR (AUB)

Across the MENA region, persistent challenges to quality education, including economic instability, political unrest, social constraints, and recent disruptions like COVID-19 and school strikes, have exacerbated the situation, leading to a rising rate of dropout. These factors undermine efforts to promote educational attainment and social mobility, as some children are forced to leave school to seek employment and secure basic nutritional needs for themselves and their families. In response, our Community Service Project (CSP) proposes a comprehensive approach centered on fostering nutritious school feeding initiatives. By addressing the daily basic nutritional needs of school children, we aim to prevent dropout, reduce incidence of child labor, and reach better academic achievements. Our investigation involves qualitative data collection, including in-depth interviews with stakeholders such as teachers, parents, NGOs, and leaders in the food industry. These interviews enable us to gain insights into the underlying factors affecting educational access and attainment in the MENA regions, informing the design and implementation of effective intervention strategies. Despite the recognized importance of school feeding, it still receives insufficient attention and faces significant challenges in implementation. Our CSP project aims to build a thoughtful sustainable solution that addresses the complex challenges facing education in the MENA region by nourishing minds and bodies alike (...)

EDUCATION

Language Learners in the MENA Region

NOURANE ZAROUR (LAU)

Several theorists, philosophers, and experts have been influential and left an impact on the field of education that has endured over time. Many of them laid the foundation and the groundwork for educational approaches that gradually developed over the years. Active learning was a concept that was mentioned across various fields, and it is currently being applied to modern education. Various theorists have argued for the positive impact of incorporating active learning strategies in the classroom and later extended it to language classrooms. The main question asked in this study is to what extent active learning strategies can be effective in the language learning classroom and if they truly elevate students' academic performance and achievements. Therefore, the main aim was to investigate the positive influence of using such strategies on students, specifically in English classrooms in the MENA region. A detailed scoping literature review search was carried out, concentrating on recent scholarly sources that demonstrate the efficiency of using active learning strategies in language classrooms. Findings highlighted their importance and confirmed their positive impact on boosting students' academic achievement and creating an interactive learning environment. This paper contributed to the ongoing research on the positive influence of using active learning strategies with English learners, specifically in the MENA region.

Perceptions of Grade 12 Socio-Economics Students on the Integration of Real-Life Scientific Applications in Biology Classrooms

DIANA AL FARRAN (LAU)

Lebanon's educational system faces major criticism for its outdated national science curriculum, particularly in addressing essential 21st-century skills. As a result, high school students exhibit disengagement in science classrooms. To tackle these issues, an intervention integrating real-life applications into grade 12SE biology classes was implemented throughout the 2022-2023 academic year. Post-graduation, a survey assessing 31 students' motivation, interest, and attitudes toward science was conducted. Additionally, semi-structured interviews were carried out with 6 students to further explore how the intervention affected students' perceptions of science. Through the analysis of the survey's responses, the interview transcripts, and the teacher's diary, the study explored the impact of real-life applications on students' views of science. Findings revealed a positive impact on students' perceptions of science, aligning with existing literature emphasizing the benefits of real-life applications in learning. This study contributes valuable insights into revitalizing the methods used to teach science and the Lebanese science curriculum by advocating for a more engaging approach. Addressing this study's limitations and embracing the recommendations discussed could lead to a more contemporary and effective educational framework, aiming to optimize the integration of real-life applications in science classrooms.

EDUCATION

The Impact of Using the IBL Approach and the 5 E Framework in Mathematics Classrooms on Students' Motivation and Engagement

RAYAN AL TULYANI (LAU)

In this era, the field of mathematics education stands at a crucial intersection, as students expect multidisciplinary knowledge and practical applicability. Traditional teaching methods that prioritize memorization and abstract ideas frequently cause students to become disengaged and disconnected from the relevance of the material in real life. Understanding this difficulty, this study investigates the impact of integrating Inquiry-Based Learning (IBL) and the 5E framework in teaching secondary mathematics on students' motivation and engagement. A mixed-methods approach was used in this study. A total of 20 students from a private school in the Bekaa district participated in the study. Two questionnaires were conducted prior to and after the study to examine the impact of the intervention on students' motivation and engagement. Additionally, interviews were conducted with 6 students and the educator to gather qualitative feedback. The findings of the study revealed that implementing this approach in secondary mathematics classrooms significantly enhances intrinsic motivation by linking academic content to real-world contexts, fostering collaborative group dynamics, and promoting autonomy. Moreover, it demonstrated substantial improvements in behavioral, cognitive, and emotional engagement levels, nurturing critical thinking, problem-solving, and communication skills essential for students' holistic development. Despite limitations in sample size and scope, this research advocates for reform in teaching approaches in mathematics education, promoting the adoption of IBL and the 5E framework to create inclusive, engaging, and skill-oriented learning environments.

Digital Intelligence in Egypt's K-12 Schools: A Qualitative Study

MOHAMAD AL MOUSSA (AUC)

Technological integration has been a dominant feature of Egypt's education lately, with schools incorporating technology into their practices through online classes, digital textbooks, e-learning platforms, and digital examinations. Egypt's educational reforms toward digital-based learning require teachers and students to possess the knowledge, skills, attitudes, and values to become effective and responsible users of the transforming digital education system and the digital world in general. This set of competencies is known as Digital Intelligence (DQ). Despite the importance of DQ skills in Egypt's technological transformation in education, little attention has been paid to researching DQ education in K-12 schools of Egypt. Thus, this qualitative study explores Digital Intelligence in Egyptian K-12 schools, brings the attention of educational policymakers in Egypt to DQ skills and their significance, and provides insights into the development of DQ in K-12 education. The findings of this study will encourage policymakers and educational leaders to consider programs to develop DQ skills during educational reforms.

EDUCATION

What is Beyond Graduation for MENA Scholarship Alumni? Understanding the Global Journeys of Tomorrow's Leaders Scholarship Alumni

ALBARAA QURADI (AUC)

The research conducted by the author delves deeply into the migration experiences of students from the Middle East and North Africa (MENA) region, with a specific focus on graduates of the Tomorrow's Leaders scholarship program. Through the use of a case study methodology (interviews and participatory methodology), the study investigates the experiences of the students and their relationship with their countries of origin, their aspirations and capabilities, countries of education, and their experience after graduation. The study focuses on the drivers and factors that play a role in what graduating students do after their graduation and where they go. Essentially, I will try to answer the following question: "What factors influence the migratory decisions of scholarship-awarded students from the MENA region at the end of their scholarship duration?" using in-depth qualitative interviews to answer this question. The investigation critically analyzes the aftermath of pursuing higher education on a scholarship basis abroad, shedding light on how migration experiences are intertwined with broader issues of development and inequality in the MENA region. Furthermore, the research examines the factors that drive students to pursue further studies abroad and provides insights into the policies and procedures governing their movement and entry into countries of education and beyond. This contribution to the existing literature on the migration experiences of MENA scholarship recipients goes beyond by exploring the influence of social networks on migratory trajectories. The study emphasizes the need to understand the multifaceted factors that impact the mobility decisions of international students after graduation. As mentioned above, this thesis used a qualitative, in-depth interview methodology (…)

IT AND TECHNOLOGY

Multi-Modal Arabic Negotiating Bot

SAMAH ALBAST (AUB)

Negotiation is a fundamental aspect of human interaction, involving a dynamic exchange of communication between two or more parties to reach mutually agreeable outcomes. With recent advancements in chatbots, leveraging artificial intelligence (AI) for negotiation has emerged as an ideal application. Despite significant progress in English negotiation bots using deep learning and reinforcement learning, such advancements are notably absent in other languages, particularly Arabic. Furthermore, while previous research has primarily focused on developing high-performing neural response generation systems for negotiation bots, the integration of multimodality into these automated agents remains unexplored. The incorporation of multimodality is represented in image analysis, and it contributes to a more comprehensive and user-friendly negotiation model. In this thesis, our objective is to construct an Arabic multimodal negotiating bot. We aim to address the challenge of developing a seller agent capable of engaging in negotiations with a buyer within the context of item sales. The seller is not only capable of understanding the buyer's Arabic utterances but also of comprehending the negotiation context through images provided by the buyer. To accomplish this goal, a Generative Pre-trained Transformer (GPT-2) model is trained on an Arabic dataset and integrated with a Convolutional Neural Network (CNN) model for image analysis. Our experiments showcase the success and limitations of the designed multi-modal Arabic negotiating model. Our analysis offers an in-depth understanding of inherent challenges and sets directions for future research in developing negotiating bots for Arabic and other languages.

Paint Thickness Evaluation and Degradation Assessment Using Hyperspectral Imaging

MARWA AL SAKKAF (AUB)

Coatings are essential to protecting various industrial structures from environmental damage. Failure of coating systems not only exposes the substrate to environmental conditions but also accelerates degradation, leading to costly maintenance and potential safety hazards. Inspection methods focus on detecting mechanical degradation through visual inspection or thickness measurements using techniques like 'Eddy current'. In this study, we demonstrate the use of hyperspectral imaging (HSI) for paint condition assessment, with a specific focus on evaluating paint thickness. In the literature, the utilization of HSI in assessing paint condition has been primarily centered on visible damage or degradation classification, lacking in early degradation detection. Moreover, the common practice of scheduled maintenance to re-paint, particularly in industries like aerospace, fails to guarantee the coating's health throughout its intended service life. A comprehensive framework that integrates HSI with a spectral range of 930-2500 nm and machine learning (ML) algorithms is proposed to evaluate paint thickness as an indicator of degradation. This framework aims to exceed the limitations of reactive techniques by offering predictive insights into the early stages of coating degradation. The anticipated framework involves using HSI for precise paint thickness measurement, knowing that thickness reduction is a sign of degradation, along with exploring the penetration depth of HSI. By incorporating HSI and ML (Stochastic Gradient Descent (SGD) Regressor), the proposed model yielded compelling results, with a noteworthy root mean squared error (RMSE) of 18.2 μm and an R2 coefficient of determination of 0.88 for predicting paint thickness based on the reflectance. (...)

IT AND TECHNOLOGY

Federated Machine Learning and TinyML Inference for Crop Disease Classification on Smartphones

HADI HASAN (AUB)

As the agricultural industry undergoes a technological revolution, the integration of machine learning (ML) and mobile technologies emerges as a promising solution to address crop disease management efficiently. In this paper, we present a novel approach combining federated learning (FL) and TinyML inference for crop disease classification on smartphones. Our research encompasses the development of a web application for dataset collection, complemented by a mobile application tailored for farmers. Through rigorous training, we produced multiple ML models, each specialized in detecting diseases across different plant types. These models were subsequently hosted for offline use, empowering farmers with real-time disease identification capabilities directly on their smartphones. Leveraging FL techniques, our solution ensures adaptability and scalability, crucial factors in the agricultural domain. Furthermore, employing TinyML inference enables efficient model execution on resource-constrained devices without compromising accuracy. Evaluation results demonstrate an impressive average accuracy of 98% across all deployed models. This framework represents a significant step forward in democratizing access to advanced agricultural technologies, enhancing crop disease management, and contributing to global food security.

Green adsorbent for Water Treatment

DALIA KANAA (AUC)

The increased need for new antibiotics resulted from the resistance of the available ones. Water pollution with antibiotics is one of the drivers behind antibiotic resistance (AR). As a result of antibiotic metabolism, small amounts of the active forms of antibiotics are delivered into water, which are enough to develop (AR). Many studies proposed removal methods, some of which have high efficiency. However, most of them are expensive or complicated procedures. Research is still needed to find a suitable water treatment method that is not expensive, sustainable, and easy to apply. Beyond a lot of removal methods, adsorption is a promising technique since it may have high efficiency and selectivity, besides the ability to be applied for high scaling. This research focuses on using solid adsorbents of polyvinyl alcohol-formaldehyde (PVF) derivatives. PVF is mainly composed of a non-toxic and biodegradable polymer. However, it has a very small adsorption capacity. Therefore, an environmentally friendly composite sponge of PVF derivatives was fabricated. First, it is functionalized with rice husk extract. Second, rice husk extract was used as a reducing agent to synthesize green zinc oxide nanoparticles. These nanoparticles have a high surface area. They add surface modifications and are expected to increase the efficiency of the fabricated adsorbent. Changes in the adsorption performance of the fabricated adsorbent are studied. Adsorption efficiency evaluation is done by calculating the removal %R and adsorption capacity qe of 100 and 50 ppm ciprofloxacin aqueous solutions.

IT AND TECHNOLOGY

Timeline GPT Utilizing LLMs for Automatic Timeline Generation of News Data

WANES HAIG TUTUNJIAN (AUB)

Automatic timeline generation is an essential and challenging information retrieval task. This work presents a novel approach for automatic timeline generation from news articles that leverages recent advances in Large Language Models (LLMs) and their successful applications in various NLP tasks. Given a set of documents and a topic of interest, our approach utilizes GPT-4 Turbo, a state-of-the-art LLM, to generate a comprehensive timeline of relevant events to the input topic from the provided documents, focusing on key milestones and events leading up to or following those milestones. To evaluate our approach, we benchmark it against various state-of-the-art automatic timeline generation approaches using the standard Timeline17 benchmark. Our proposed approach outperformed all other approaches with over 87% improvement on the Alignment ROUGE-1 score and over 125% improvement on the Alignment ROUGE-2 score, which are variants of the ROUGE scores suitable for evaluating timelines. We demonstrate our approach using multiple case studies from the Timeline17 dataset, such as the Haiti earthquake and the Deepwater Horizon oil spill, showcasing that it can generate coherent and accurate timelines compared to human-generated ones, highlighting the impact it has in social, historical, and political contexts, particularly in the domain of investigative journalism.

Enhancing Tunnel Ventilation Efficiency: Passive Techniques for the Salim Salam Tunnel

OMAR ALLAHAM, YASIN BARBAKH, HILDA HATOUM, GHAMDAN AL-MAHAZIMAH (AUB)

Tunnel ventilation is a crucial element of transportation infrastructure worldwide, with the goal of providing safe and comfortable passage for vehicles and pedestrians. Throughout history, different techniques have been used to tackle the issues caused by limited spaces and vehicle emissions in tunnels. Initial methods mainly depended on natural ventilation, using the pressure variances created by vehicle motion to aid in air circulation. As traffic volumes rose and environmental regulations became stricter, the necessity for advanced ventilation systems became evident. Moreover, the emergence of sustainable design principles has promoted the exploration of passive ventilation strategies, leveraging natural phenomena such as chimney, wind, and solar energy to enhance ventilation performance while reducing energy consumption. In the context of Lebanon, the Salim Salam Tunnel, stands as a pivotal component of the country's transportation infrastructure. However, it encounters challenges concerning ventilation efficiency and air quality management. With increasing vehicular emissions and growing environmental concerns, it is crucial to explore innovative approaches to enhance ventilation effectiveness while minimizing energy consumption and the environmental impact. This research focuses on investigating passive ventilation techniques as a sustainable solution for improving the efficiency of the Salim Salam Tunnel's ventilation system. For this purpose, data related to air quality and ventilation parameters will be collected, mathematical models will be formulated for simulation purposes including the conditions of the tunnel with all (...)

IT AND TECHNOLOGY

Advancing Healthcare Decision-Making: A Fusion of Machine Learning, Data Mining, and Prescriptive Learning Theories

NOURAN ALI (AUC)

This research delves into the convergence of machine learning (ML), data mining, and prescriptive learning theories to revolutionize decision-making within healthcare systems. As ML gains ground in predicting early disease stages, the need for rigorous clinical validation and seamless integration into decision-making processes becomes paramount (Graham et al., 2019). An exhaustive literature review emphasizes healthcare's pivotal role in fostering well-being. Significantly, ML's predictive prowess in identifying diabetes risk among prediabetic patients highlights opportunities for proactive interventions (Chattopadhyay et al., 2021). The study pursues three overarching research objectives: (1) investigate data mining techniques, specifically association rule mining, for analyzing decision-making in healthcare systems, focusing on mental health and diabetes; (2) explore challenges and opportunities in implementing prescriptive learning theories in software systems to enhance user guidance and evaluate their impact on decision-making and system usability; (3) calibrate ML models for predicting work-hour-related outcomes in decision-making scenarios, scrutinizing the practical implications of these enhancements. This research contributes novel insights into the effective application of data mining and ML in healthcare decision-making. By addressing challenges in prescriptive learning theory implementation, our findings aim to elevate user guidance and system usability, promising advancements in healthcare decision-making by bridging the gap between predictive models and actionable insights.

AraDialAug: A Meta-Learning and Data Augmentation Approach for Arabic Dialogue Generation

ASSAAD EL HALABI (AUB)

Arabic dialogue generation presents unique challenges due to the language's rich morphology and the scarcity of data resources. Recent advances have employed meta-learning to facilitate the fast adaptation of language models to low-resource domains. This thesis builds upon such groundwork by introducing paraphrase data augmentation to further improve the generalization and adaptation capabilities of pre-trained models in Arabic Natural Language Generation (NLG). We propose an enhanced approach that leverages a fine-tuned ARAT5 model with meta-learning via the Reptile algorithm. Our methodology encompasses augmenting both the context and responses within the auxiliary and target datasets. We incorporate paraphrased data augmentation for 10% and 30% of the seed data, examining the resultant impact on model performance. Our experiments demonstrate significant improvements in dialogue generation quality, as evidenced by higher BLEU-4 scores and Semantic Textual Similarity (STS) metrics in intrinsic evaluation, even with limited data. These results surpass those achieved by the state-of-the-art methods described in prior work. The qualitative evaluations reinforce the quantitative metrics, indicating a noticeable enhancement in the fluency and relevance of the generated responses. Our findings suggest that paraphrase data augmentation, when used judiciously within the framework of meta-learning, can serve as a powerful tool for advancing the field of Arabic conversational AI, particularly in low-resource scenarios.

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