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Editorial

We are delighted to extend a warm welcome to all participants attending the International Conference 2024 on 04th - 05th November 2024. This conference provides a vital platform for researchers, students, academicians, and industry professionals from all over the world to share their latest research results and development activities in multidisciplinary fields. It offers delegates an opportunity to exchange new ideas and experiences, establish business or research relationships, and explore global collaborations.

The proceedings for International Conference 2024 contain the most up-to-date, comprehensive, and globally relevant knowledge across various disciplines. All submitted papers underwent rigorous peer-reviewing by 2-4 expert referees, and the papers included in these proceedings were selected for their quality and relevance to the conference. We are confident that these proceedings will not only provide readers with a broad overview of the latest research results but also serve as a valuable summary and reference for further studies.

We are grateful for the support of many universities and research institutes, whose contributions were vital to the success of this conference. We extend our sincerest gratitude and highest respect to the professors who played an important role in the review process, providing valuable feedback and suggestions to authors to improve their work. We also appreciate the efforts of the technical program committee, reviewers, and authors for their dedication.

Since September 2024, the Organizing Committee has received more than 65 manuscript papers, covering various aspects of multidisciplinary research. After review, approximately 46 papers were selected for inclusion in the proceedings of International Conference 2024.

We thank all participants for their significant contribution to the success of the conference. Our gratitude extends to the keynote speakers, individual speakers, technical program committee, reviewers, and the organizing committee for their efforts in making this conference a reality.

Acknowledgement

The International Conference 2024, was successfully held in 04th - 05th November 2024. We extend our heartfelt gratitude to our colleagues, staff, professors, reviewers, and members of the organizing committee for their unwavering support in making this conference a success.

We would also like to thank all the participants who traveled far and wide to attend this conference and those who attended the event virtually, making it a truly global event. This conference provided a platform for students, professionals, researchers, and scientists to share their latest research and developments in various disciplines.

The aim of the conference was to promote research and development activities and to encourage scientific information exchange between researchers, developers, professionals, students, and practitioners from all around the world. Once again, we thank everyone who contributed to making this conference a resounding success.

Dr. Robert Taylor
President
International Institute for Technology Education and Research (IITER)

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Are They Ready? Readiness for Problem-Based Learning in Higher Education

Elaine Chapman

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Abstract:

Since its inception in 1969 at a Canadian medical school, Problem-Based Learning (PBL) has gained increasing popularity. PBL is generally described as a constructivist learning environment that emphasizes hands-on, experiential learning, focused on investigating, explaining, and solving problems (Hmelo-Silver, 2004). In this method, students acquire knowledge and thinking skills by tackling problems in small collaborative groups. A typical PBL session starts with a loosely defined problem. The students must then work together to identify and address the issues, fill gaps in their understanding, and find a suitable solution, with a facilitator guiding them through the process. In addition to the subject-specific knowledge and skills gained, PBL is designed to foster the development of critical thinking, problem-solving, and self-directed and collaborative learning abilities (Lieux, 2001; Schmidt, Vermeulen & Van Der Molen, 2006).

While PBL has gained many supporters across various educational fields, some evidence suggests that certain students find PBL environments challenging. Research indicates that although many students appreciate and find satisfaction in the PBL approach (Caplow, Donaldson, Kardash & Hosokawa, 1997; Rideout et al., 2002), not all students are enthusiastic about adopting it (Alper, 2008; Hamalainen, 2004; Hood & Chapman, 2011). For instance, in a recent study, Fukuzawa, Boyd, and Cahn (2017) found that only 22% of students who had experienced PBL agreed they would like to attend more PBL sessions. Additionally, only 41% expressed interest in taking another course utilizing PBL. The study also revealed that some students' motivation was negatively affected due to their unfamiliarity with the PBL process.

Recent studies have highlighted the critical role of student preparedness for significant transitions throughout their educational journeys. In educational settings, readiness generally refers to the degree to which students possess the necessary skills, attitudes, and knowledge to actively participate in and benefit from the learning opportunities provided in a particular environment (e.g., Kentucky Department of Education, 2019). According to a 2013 ACT report (ACT Policy Reports, 2013), many students fail to complete their college education because they are underprepared for higher education and require remedial classes. Additionally, many students lack the academic habits and goals essential for college success (p.2). Readiness also plays a crucial role in shaping students' responses to and performance in specific learning environments.

De Graaff and Kolmost (2003) pointed out that Problem-Based Learning (PBL) differs significantly from traditional teaching methods in several important ways. One of the main distinctions is that PBL focuses on giving students open-ended problems, rather than clearly defined tasks with a single correct solution. Additionally, PBL emphasizes the use of critical thinking skills, encouraging students to engage in both independent and collaborative learning. This approach contrasts with more conventional educational settings, where these skills may not be as strongly emphasized. Due to these unique features, some students may be more suited or better equipped for PBL environments than others, based either on their individual backgrounds or prior experience with similar learning methods. These differences in readiness can help explain the variations in how students perform and respond when they first encounter PBL in higher education settings. Given the evidence that students'

responses to PBL environments can vary widely, it would be beneficial for institutions that use PBL as a core teaching strategy to evaluate students' preparedness for its different components. By doing so, institutions could create tailored support systems to help students who may be at risk of struggling in these settings, ensuring they have the tools to succeed. Despite this, few broad tools to measure such readiness are available.

This presentation will outline an instrument designed to assess students' readiness for PBL in higher education (the Readiness for Problem-Based Learning scale, or RPBL), jointly developed by the presenter. This instrument has two main components: A cognitive processing component, and a learning processes component. This instrument has been validated with a large group of tertiary level students in Singapore, and has demonstrated excellent psychometric properties. With many institutions now making use of PBL, it is important for students' readiness for these environments to be assessed. Efforts to achieve this goal may, however, be hampered by a scarcity of suitable instruments for this purpose. The results of the present study suggest that, while further validation efforts would be beneficial, the RPBL holds considerable promise for meeting this important need.

Cultural Preservation and Identity: Exploring Strategies for Preserving Cultural Identity among Refugees, Migrants and Minority Communities While Promoting Integration and Social Cohesion

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Abstract:

In the face of increasing global migration, the preservation of cultural identity among refugees, migrants and minority communities presents a significant challenge. This paper explores various strategies aimed at preserving cultural identity while simultaneously promoting integration and social cohesion within host societies. Through a comprehensive review of existing literature, this research identifies key factors that contribute to the successful maintenance of cultural heritage. The study emphasizes the importance of community-driven initiatives, inclusive policies and educational programmes in fostering a sense of belonging and mutual respect among diverse populations. Additionally, it highlights the role of intercultural dialogue and collaboration in bridging cultural gaps and enhancing social harmony. By examining successful models and potential obstacles, this paper provides a sound understanding of how cultural preservation and integration can coexist, ultimately contributing to more cohesive and inclusive communities. The findings offer valuable insights for policymakers, social workers, educators and community leaders committed to supporting cultural diversity and social integration in an increasingly interconnected world.

Keywords:

Cultural preservation, cultural identity, minority communities, integration, social cohesion.

Epigaeic Invertebrate Communities in Nduli Nature Reserve, Eastern Cape, South Africa: Implications for Conservation Management

Augustine Niba

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Abstract:

Knowledge of invertebrate species diversity within protected areas in the Eastern Cape Province of South Africa is lacking. The main objective of the current study was to identify invertebrate communities from a-priori selected sites: Marsh, Forest, Grassland and Ecotone in Nduli Nature Reserve, Eastern Cape Province. A total of N=624 epigaeic invertebrate specimens distributed as follows: Marsh (N= 240), Forest (N= 131), Grassland (N= 175), and Ecotone (N =107) were collected during the cold/dry and rainy wet seasons and sorted into S=98 species, 34 families and 14 orders. Faunal species richness and abundance was highest in the Marsh habitat in the Cold/dry season (S= 32, S = 24) and the Warm/rainy season (S= 32, N = 46), followed by the grassland habitat in the Cold/dry season (S= 15, N= 18), and the rainy/wet season (S= 24, N= 32). Species occurrence and habitat preference at study sites was determined by leaf litter, % shade, % Vegetation cover, Soil density, Magnesium and Phosphorus cations that were also dependent on seasonality. Common/widespread, common habitat-restricted and habitat-specific invertebrate categories identified in the study can be used as indicators for assessing the ecological integrity of the reserve.

Hybrid Deep Learning Ensemble Model Based on Two-Stage Feature Selection for Sludge Age Prediction

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Abstract:

Precise forecasting of sludge age can facilitate the daily monitoring and management of wastewater treatment facilities (WWTPs) to guarantee effluent compliance to regulations while minimizing energy usage. Nonetheless, the multivariate time series prediction of SAGE presents a problem owing to the intricate nonlinearity of wastewater treatment plants (WWTPs). This study presents an innovative methodology for predicting SAGE that integrates a two-stage feature selection model with a hybrid deep learning architecture, CNN-bi-LSTM-DNN (CBLD), designed to proficiently capture the nonlinear interactions inside multivariate time series in wastewater treatment plants (WWTPs). Specifically, Convolutional Neural Network (CNN), Bi-LSTM (Bidirectional Long Short-Term Memory), and Deep Neural Network (DNN). A two-stage feature selection method is employed to identify the ideal feature subset, thereby reducing complexity and enhancing the accuracy of the prediction model. Experiments demonstrate that the two-stage feature selection model identifies the optimal feature subset for prediction, whereas the CBLD model attains superior performance.

Keywords:

Activated sludge, Bi-LSTM, Sludge Age, Wastewater Treatment, Deep neural network, prediction.

‘EBYO’BUFUZI’ Political Rights in Uganda

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Abstract:

This abstract provides an overview of the state of political rights in Uganda, emphasizing the complexities and challenges that define the political landscape of the country. As Uganda continues to evolve, the fundamental aspect of political rights remains pivotal in shaping its democratic fabric. Political rights in Uganda are enshrined in the Constitution and various international agreements to which Uganda is a signatory. These rights include the freedom to participate in political processes, the right to vote, and the right to run for public office. Despite these constitutional guarantees, the practical realization of these rights is often hindered by several factors. The political environment in Uganda has been characterized by a mix of progress and setbacks. On one hand, the country has made strides in institutionalizing democratic processes and expanding political participation. On the other hand, challenges such as political repression, electoral malpractices, and restrictions on freedom of expression persist, impacting the overall democratic health of the nation. In Katabi Town Council, we have witnessed both the potential and the limitations of political rights in action. While there are opportunities for civic engagement and local governance, issues such as limited resources, political polarization, and the influence of national politics on local affairs continue to affect the effectiveness of political rights at the grassroots level. This abstract aims to highlight the critical areas where political rights can be reinforced and the steps needed to ensure a more inclusive and transparent political process. It calls for a concerted effort from all stakeholders—government, civil society, and citizens—to address these challenges and foster an environment where political rights are genuinely respected and upheld.

Keywords:

Political Rights, Uganda, Democratic Processes, Electoral Integrity, Local Governance.

Maestros of Innovation: Leading the Fusion of Music and STEM from Prelude to Finale

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Abstract:

Integrating music with Science, Technology, Engineering, and Mathematics (STEM) creates transformative opportunities for students across all educational levels, from early childhood to higher education. By embedding music within STEM and vice versa, students can engage in a variety of meaningful STEAM curricular opportunities. Active music in STEM for STEAM range from sound engineering and physics to instrument design and the use of computing technology and makerspaces. Additionally, applications of sound beyond traditional music production, such as voiceovers and sound effects, are explored, along with the psychoacoustics of musical cognition. The research demonstrates how educational leaders, principals, superintendents, and higher education administrators, can employ distributive leadership to facilitate STEAM integration. The researcher draws on experiences as an instructional leader to showcase strategies for creating multipurpose curricular spaces that promote innovative, interdisciplinary, and transdisciplinary STEAM learning. The study also emphasizes the importance of forming inclusive partnerships with external business members, community stakeholders, parents, staff, and students to design and implement effective curricula. Through these collaborative efforts, educational leaders can ensure that all students have access to creative and engaging learning experiences that merge music and STEM from prelude to finale.

Keywords:

STEM, Music, Instructional leadership, Distributive leadership, Psychoacoustics.

Fostering Positive School Culture to Promote Higher Student Outcomes

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Abstract:

The culture of a school starts with administration and staff. Correlational research conducted between 2000 and 2020 found that school climate and classroom climate had significant correlation to academic achievement (Erdem, & Kaya, 2023). The culture of a school impacts student learning. School administration culture has the second greatest effect on student success because they provide vision, develop staff, and organize staff to implement the vision. In addition, they oversee the academic programs (Neufeld, 2019). School culture encompasses organizational learning, relational trust, accountability, and teacher effectiveness (Kaplen & Owings, 2013).

This session will start with an overview of the research outlining how positive staff culture promotes higher student outcomes. In addition, participants will gain a solid understanding of the underpinning to creating a positive culture. Strategies for implementation and how to foster positive staff culture will be discussed, along with how to problem solve contentious staff interactions and chemistry.

A ReFLECtS Model of Trustworthy Artificial Intelligence: Perspectives from an Autonomous Vehicle Context

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Abstract:

Trustworthiness of AI help define standards of AI performance in various domains of applications. This study presents the ReFLECtS model from an autonomous vehicle perspective to guide discussions on qualities that would define trustworthy AI. Through ReFLECtS, we propose six dimensions of AI trustworthiness: *Reliability* (Re), *Functionality* (F), *Human-Likeness* (L), *Explainability* (E), *Controllability* (Ct), and *helpfulnesS* (S). The model of trusting beliefs, which espouses that reliability, functionality, and helpfulness are the core dimensions of technological trustworthiness, is the theoretical basis of the development of ReFLECtS. Discussions on trustworthy AI in extant literature have highlighted multiple qualities. Yet, some have proposed strategies for attaining trustworthy AI rather than qualities that define trustworthy AI. The development of ReFLECtS provides an organizing framework that can guide future inquiries into AI trustworthiness. The development of ReFLECtS from an autonomous vehicle context cast the spotlight on trustworthy AI used in transportation technologies. AI in autonomous vehicle is particularly worthy of attention because this topic is underexplored despite autonomous vehicle being a major domain of AI application and its implications on society. This study developed ReFLECtS based on the responses that 56 drivers and non-drivers (i.e., public), and nine technology developers provided across seven focus group discussions conducted in Singapore between July and October 2023. Analysis of responses and development of ReFLECtS have been completed. We elucidate the results and discuss the implications of the dimensions for trustworthy AI in autonomous vehicles. Further analyses and discussions provide insights into differences in qualities raised by the public and technology developers.

Keywords:

Trustworthiness of artificial intelligence, autonomous vehicles, human-likeness, explainability, controllability, helpfulness.

Sustainable Development of Eco-Friendly Bio-Nanocomposites: Utilizing Nanocellulose Extracted from Saccharum Officinarum for Advanced Applications

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Abstract:

This study presents the development of eco-friendly bio-nanocomposites using poly(lactic acid) (PLA), poly(caprolactone) (PCL), and their blends with nanocellulose extracted from *Saccharum Officinarum*. The extracted nanocellulose was optimized through chemical treatment and hydrolysis processes, yielding a sustainable and renewable resource for enhancing polymer properties. Bio-nanocomposites of PLA/nanocellulose, PCL/nanocellulose, and PLA/PCL/nanocellulose with varying nanocellulose contents (1, 3, and 5 wt%) were prepared via melt-blending and characterized using Fourier-transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM), thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), X-ray diffraction (XRD), dynamic mechanical analysis (DMA) and tensile testing. The results show significant improvements in the thermal and mechanical properties of the polymeric matrices upon the addition of nanocellulose, demonstrating the potential of these bio-nanocomposites for advanced applications. These developments are promising for obtaining bio-nanocomposites from local bio-sources, leading to more sustainable and eco-friendly alternatives to traditional materials.

Keywords:

Bio-nanocomposites, Polycaprolactone, Poly(lactic Acid), Nanocellulose and *Saccharum Officinarum.*

Detection and Quantification of Pests in Corn Seeds Using X-Rays and Artificial Intelligence

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Abstract:

Corn (*Zea mays* L.) is one of the most important food crops for the production of cereals used for both animal and human consumption, being cultivated worldwide. Different pests can compromise the quality of stored seeds and grains, especially in tropical and subtropical regions, causing significant economic losses to the agricultural and food industries. Damage caused by feeding larvae, pupae, and adults can substantially reduce grain weight and quality during storage, facilitating the entry of pathogens and mites. Traditional methods for detecting pests in corn are time-consuming and difficult to handle. In this context, the development of advanced methods for early pest detection in grains and seeds is essential to expedite decision-making in the agricultural sector. To optimize this decision-making process, a software prototype was developed to assess pest infestation in corn seeds and grains using automated analysis of X-ray images. Six seed batches were separated with the following infestation percentages: 0%, 8%, 12%, 14%, 16%, and 20%, previously selected through X-ray analysis using the "Faxitron HP" equipment, model 43855A. After image capture, a software prototype was created using computer vision techniques and artificial intelligence training with Roboflow®. Tests were conducted with two repetitions of 100 seeds for each batch. The software demonstrated 96% accuracy in automatically identifying pest-infested seeds through X-ray images. Therefore, it is evident that the image analysis tool developed in this study has high applicability in the seed sector, providing greater precision and agility in evaluating infested seeds when performed on radiographed images.

Keywords:

Productivity, artificial intelligence, *Zea mays*.

Precision Vertical Farming System with IoT Automation for Sustainable Microgreens Production

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Abstract:

A Precision Vertical Farming System (PVFS) was developed for pesticide-free microgreens production. The system grows plants vertically indoors, using emerging technologies such as the Internet of Things (IoT) for monitoring and automation. A multiplatform software, developed in Flutter, ensures a robust interface for mobile and desktop devices, allowing environmental variables to be controlled via an Android app. The PVFS is structured into four layers (devices, hardware, protocols, and application) and uses Dart and Flutter to provide efficiency and flexibility. Communication between devices is carried out via APIs and protocols such as MQTT and WebSocket, ensuring real-time monitoring. The hardware is based on the ESP32, with sensors to monitor humidity, temperature, carbon dioxide (CO2) concentration, dimming (%), energy consumption (kWh), power (W), and power factor. LED lighting is adjusted according to the plants' needs, optimizing the environment for microgreens production. The automated system was validated by cultivating lentil microgreens, using programmable LEDs in different light spectra: RBW (red, blue, and white), blue, white, and red, inside a growth chamber. Two experiments were conducted: one with constant light intensity of 250 µmol/m²/s and another with light adjusted by a Gaussian curve, resulting in a DLI of 10.80 mol/m²/day. In the Gaussian experiment, the maximum intensity was 500 µmol/m²/s, and the minimum was 85 µmol/m²/s. Growth parameters and energy consumption per production were evaluated. Statistical analysis (ANOVA and PCA) revealed that cultivation under red light and constant regime promoted better energy efficiency and total biomass of seedlings, followed by red light under the Gaussian regime. In contrast, cultivation under white and blue light was less efficient in energy use for total biomass production. The PVFS proved to be effective in microgreens cultivation, allowing precise adjustments to growing conditions and promoting efficient and sustainable production.

Keywords:

Vertical agriculture, agricultural automation, software, IoT.

Acknowledgments:

Federal Institute of Goiás (IF Goiano); Brazilian Agricultural Research Corporation (Embrapa); National Council for Scientific and Technological Development (CNPq); Goiás State Research Support Foundation (FAPEG).

Petrology and Hydrothermal Alteration Mineral Distribution of Wells La-9d and La-10d in Aluto Geothermal Field, Ethiopia

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Abstract:

Laboratory analysis of igneous rocks is performed with the help of the main oxide plots. The lithology of the two wells was identified using the main oxides obtained using the XRF method. Twenty-four (24) cutting samples with different degrees of alteration were analyzed to determine and identify the rock types by plotting these well samples on special diagrams and correlating with the regional rocks. The results for the analysis of the main oxides and trace elements of 24 samples are presented. Alteration analysis in the two well samples was conducted for 21 samples from two wells for identifying clay minerals. Bulk sample analysis indicated quartz, illite & micas, calcite, cristobalite, smectite, pyrite, epidote, alunite, chlorite, wairakite, diaspore and kaolin minerals present in both wells. Hydrothermal clay minerals such as illite, chlorite, smectite and kaoline minerals were identified in both wells by X-ray diffraction. High temperature hydrothermal minerals; such as, wairakite, biotite, and epidote exists in both wells based on the X-ray diffraction analysis result.

Ecotoxicological Impact of Antibiotics on Aquatic Ecosystems

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Abstract:

Anthropogenic pressures on the environment pose significant threats to biodiversity, thereby undermining ecological sustainability. Antibiotics have a significant impact on the environment, and these effects can have long-term consequences on ecosystems. Current research is increasingly directed toward developing advanced screening methodologies to assess the toxic impacts of contaminants on aquatic ecosystems utilizing specific biological models known as bioindicators. Tetracycline, a widely used antibiotic, has raised significant environmental concerns due to its persistence and potential ecotoxicological effects in aquatic environments. Tetracycline can inhibit the growth of algae and phytoplankton, which are crucial for aquatic food webs. This can disrupt primary production and nutrient cycling in aquatic ecosystems. Tetracycline exposure can lead physiological changes in aquatic invertebrates like *Daphnia magna*. These effects can have cascading impacts on higher trophic levels. The ecotoxicological impact of tetracycline on aquatic environments is multifaceted, affecting not only individual species but also ecosystem functions and services. The persistence of tetracycline, it's potential to promote antibiotic resistance, and its effects on aquatic organisms underline the need for more stringent environmental regulations and advanced treatment technologies to protect aquatic ecosystems from this pervasive contaminant.

Keywords:

Antibiotics, ecotoxicological impact, bioindicators, tetracycline.

Antimicrobial Activity of Rosemary Semivolatile Compounds Obtained Through a New Enzyme Assisted Extraction Technique

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Abstract:

Integrating traditional knowledge of medicinal plants with modern research can lead to innovative discoveries and the protection of cultural heritage so that the research and use of plant extracts can contribute to the conservation of biodiversity and the sustainable use of natural resources. Rosemary (*Rosmarinus officinalis* L.) is known for its rich content of active compounds, which give it various beneficial properties for health and uses in various fields. Numerous research investigations have documented the biological bioactivities of rosemary extracts, including its hepatoprotective, antifungal, insecticidal, antioxidant, and antibacterial properties. The antimicrobial efficiency of rosemary extracts is influenced by the extraction method and the solvents used. The breakdown of cellulose and pectin structures from cell walls and membranes of plants was enhanced by enzymes, which raised the yield of bioactive chemicals extracted and their antibacterial activity. The objectives pursued in this study include the identification of bioactive compounds, the evaluation of antimicrobial efficiency by testing and quantifying the capacities of plant extracts to inhibit the growth of different bacterial strains.

Keywords:

Antibiotics, ecotoxicological impact, bioindicators, tetracyclin.

Toxic Ties: How Environmental Pollutants Paints the Colorful Spectrum of Autism Variants

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Abstract:

According to the most recent Canadian Health Survey on Children and Youth, approximately 1 in 50 (2.0%) Canadian children and youth aged 1 to 17 years have been diagnosed with Autism Spectrum Disorder (ASD). Among these, up to one-third exhibit the loss of language, social, and motor milestones between 18 and 24 months, a condition known as Autistic Regression (AR). The relationship between environmental toxicants and the prevalence of autism, particularly AR, remains significantly underexplored. Our previous work suggests that there may be a differential association between exposure to industrial chemical emissions and ASD variants within the geographical region of Alberta. This Ontario study aims to assess the association between autism variants and industrial emissions of toxicants affecting the immune and nervous systems, and to determine if AR differs from ASD in terms of the types, duration, concentration, and timing of toxicant exposure. It employs a retrospective case-control design to analyze data from 562 children diagnosed with ASD, including AR, from 2018 to 2020 in the Ottawa catchment area. We have corroborated our dataset with information from the Canadian Urban Environmental Health Research Consortium (CANUE).

Preliminary analyses using Elastic Net regression identified six toxins (Sulfuric Acid, Carbon Monoxide (CO), n-Butyl Alcohol, Toluene, Cobalt, and Selenium) as most significantly associated with variations in AR and ASD prevalence across Ottawa. Notably, Sulfuric Acid and CO were linked to a 79% and 76% increase in ASD frequency, respectively, compared to AR. Welch's t-tests indicated that even low levels of certain pollutants are significantly associated with AR diagnosis, with children with AR exposed to higher Nitrogen Oxide (NO^2) and lower PM2.5 concentrations. Logistic regression analyses of patient addresses from the diagnosis year revealed that NO^2 was associated with lower odds of AR compared to ASD, suggesting AR patients were less likely to live near NO^2-emitting facilities. Similar analyses of addresses from the year of birth showed that ASD patients were more likely to reside near regions with facilities emitting Sulphur dioxide, Propylene, Fluoranthene, Benzo[ghi]perylene, Benzene, and 1,2,4-trimethylbenzene compared to AR patients. Overall, the analyses indicate that ASD is associated with a higher likelihood of exposure to diverse toxicants, while AR is linked to specific toxicants at particular concentrations.

Carbon Footprint Accounting on a Farm Level: A Novel Approach for Monitoring Greenhouse Gas Emissions

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Charles University Environment Centre

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Abstract:

Global climate change is a serious environmental problem and this is the reason why it is advisable to monitor and decrease greenhouse gas (GHG) emissions, including GHG emissions from agriculture. A novel approach is to monitor Carbon Footprint (CF) of agricultural farms, which accounts for all direct GHG emissions taking place at farms as well as indirect GHG emissions related to production of inputs into farms′ operation (such as machinery, fuels or industrial fertilizers). In our poster, we present a framework for CF accounting on a farm level, which we developed within a project financed by the structural funds of the European Union. The framework is primarily based on the GHG Protocol Agricultural Guidance and was tested on the 12 farms in the Czech Republic. In the discussion part, we investigate how particular farms′ characteristics influence their total CF, which provides insights into possibilities for decreasing farms′ GHG emissions. We also discuss how CF for farms should be presented in order to provide useful information for farms themselves, but also for other users (e.g. banks and their green lending). This is related to benchmarking of farms by their CF, which we examine as well.

Application of Artificial Intelligence in the Transformation of Human Resource Management in the Public Sector

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Abstract:

The study examines the application of Artificial Intelligence (AI) in transformation of Human Resource Management (HRM) in the public sector. It can be deduced that the use of AI in recruitment, selection and employee training have the potential to improve efficiency and effectiveness in HR processes, but also raises concerns about algorithmic bias, job displacement, and the erosion of employee trust. Three research questions that transcend to three hypotheses were formulated to act as a guide in realizing the objectives of the study. The research was anchored on diffusion innovation theory. The data for the research were sourced mainly from documented works. The data was presented and analyzed using a descriptive or content analytical method. The findings of the study revealed that AI-enabled tools can provide personalised learning and development opportunities for employees, leading to increased engagement and a greater sense of ownership over their career development. The study recommended among other things that HR professionals should communicate openly with employees about the use of AI, its purpose, and its potential impact on job roles and career development.

MRI findings in COVID-19 Patients with Lung Involvement Before and After the Treatment: A Comparative Study

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Abstract:

Objectives: Advancements in Magnetic Resonance Imaging (MRI) technology have positioned it as a competitive alternative to other imaging techniques like Computed Tomography (CT) scans. With a high incidence of lung involvement in viral infections, particularly coronavirus, we evaluated MRI's effectiveness in diagnosing lung involvement in Covid-19 patients before and after treatment.

Materials and Methods: This cross-sectional study involved 20 patients with a mean age of 49 ± 12.14 years, suspected of having COVID-19, who were admitted to Shahid Rahnemoun Hospital in Yazd, Iran. All participants underwent thorax MRI scans before and 2 weeks after treatment. Two highly experienced radiologists with over a decade of clinical and academic expertise analyzed the MRI images. The number of lobes affected, number of lobes containing Ground Glass Opacities (GGO) and consolidation, number of nodules, distribution of lesions, fibrosis, and the presence of pleural effusion were recorded. A comparative analysis was conducted to assess the proportion of patients with lesions on T2-weighted imaging (T2WI) and diffusion-weighted imaging (DWI) before and after treatment, based on the McNamara criteria. The statistical significance threshold was set at $p < 0.05$ for all criteria.

Results: The results of this study demonstrated a statistically significant decrease in the percentage of pulmonary involvement in the right lower lobe (RLL), right middle lobe (RML), left middle lobe (LML), and left upper lobe (LUL) of patients after treatment ($P<0.05$). Before treatment, 55% of patients (11 cases) exhibited lung involvement above 25% in MRI scans, while only 25% (5 cases) showed this level of involvement post-treatment. McNemar's statistical test confirmed the significant reduction in pulmonary involvement in MRI after treatment ($P<0.05$).

Further analysis using McNemar's test revealed a significant difference in the number of Ground Glass Opacities (GGO) reported in MRI scans before and after treatment. However, the differences observed in consolidation, atelectasis, and fibrosis were not statistically significant ($P>0.05$).

Conclusion: These findings provide valuable insights into the diagnostic capabilities of MRI in assessing COVID-19 lung involvement and the impact of treatment on pulmonary conditions. Although thorax CT is widely used in the imaging of COVID-19 infection, due to its advantages, MRI can also be used as an alternative diagnostic tool.

Keywords:

COVID-19 pneumonia; Coronavirus; Magnetic Resonance Imaging.

Comparative Study of Indoor Plants for PM2.5 Absorption

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Abstract:

Indoor PM2.5 air pollution, which varies due to ventilation, indoor habits, and urban outdoor sources, has garnered growing interest in using ornamental plants for mitigation. The project herein was conducted to explore whether leaf hair density, surface area, and stomatal density are effective determinants of PM2.5 reduction through comparative studies on six common household plant species: spider plants, aloe vera, rubber plants, peace lily, English ivy, and Boston fern. Conducted in homemade semi-airtight growth chambers with a household Temtop PM Monitor to monitor the released tobacco smoke and PM2.5 concentration over time, the experiment revealed significant differences in reduction of PM2.5. English ivy demonstrated the highest real average absorption rates per hour (6.21%), followed by peace lily (6.00%) and spider plant (5.33%), calculated with leakage accounted for. Still, control trials revealed that leakage could confound the relationship between plant species and PM2.5 absorption, but does not greatly impact the comparativeness of English ivy's effectiveness out of the six species. As English ivy and peace lily also rank highly in leaf surface area, stomatal density, and morphology, these data suggest that strategically choosing ornamental plants with these traits would be helpful in mitigating indoor PM2.5 levels. Further research could isolate any of the plant characteristics, particularly stomatal density, to explore its implication on PM2.5 capture.

Keywords:

PM2.5, ornamental plants, indoor air quality, household health.

Discovery and Validation of EST-Based SNPs in Diverse Genotypes in Bread Wheat (*Triticum aestivum*) for a High Yield Prospective

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Abstract:

Starch biosynthesis in wheat is a critical process that directly impacts the yield and quality of wheat grain. The AGPase (ADP-glucose pyrophosphorylase) gene plays a crucial role in starch biosynthesis, acting as a key regulatory enzyme in the pathway that determines the rate of starch production in wheat. Variations or mutations in AGPase genes can lead to significant changes in starch content and composition, affecting the yield and quality of the harvested grain. Identifying SNPs in the AGPase gene is crucial for advancing wheat breeding, crop improvement and genetics. In this study, single nucleotide polymorphisms (SNPs) in the AGPase gene of wheat were investigated using in-silico methods. We analyzed both the large and small subunits of AGPase, identifying 4 SNPs in the small subunit and 9 SNPs in the large subunit. These SNPs were validated across 36 diverse bread wheat genotypes, leading to the identification of two SNPs, SNP 829 and SNP 937, which effectively distinguished high-yielding from low-yielding genotypes. These SNPs accounted for 57.55% and 19.41% of the phenotypic variation in grain yield, respectively. This represents the first instance of AGPase-derived SNP markers associated with grain yield in wheat, providing valuable insights for breeding programs aimed at enhancing starch quality and overall wheat productivity.

Keywords:

AGPase, allele-specific marker, EST sequences, SNP marker, *T. aestivum.*

The Position of Retail Chains in the Georgian Food Market

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Abstract:

The aim of the study is the description of the competition on the food market in Georgia, its strengths and weaknesses, as well as the expression of the development of market shares in the given market. The three most commonly used methods (market share, concentration coefficient, Herfindahl–Hirschman index) were chosen for quantification. The market for food products in Georgia has long-term strong competition, which motivates chains to reduce the price of products. None of the monitored companies meets the criterion of dominance on the food market in Georgia, as none of them reaches approximately 40% of the market share (according to the sales indicator). Only two companies (Carrefour and Spar) out of 10 come from abroad and are among the TOP 5 food chains in Georgia. In the last three years, Nikora has remained the market leader. Some chains were forced to leave the Georgian market (Populi, Ioli, etc.) because they were unable to adapt to the strong competitive pressure.

Keywords:

Competition, food, Georgia, market concentration, retail chains.

Guardians of the Digital Age: A Study on Word-of-Mouth Intention

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Abstract:

The main contribution of this study lies in utilizing both symmetric and asymmetric data analysis methods to examine the relationships between the research dimensions. Specifically, the symmetric data analysis method (i.e., SEM, Structural Equation Modeling) aims to explore the net effects of the research dimensions, such as brand image, consumer opinion leadership, perceived value, and word-of-mouth intention. In contrast, the asymmetric data analysis method (i.e., fsQCA, fuzzy-set qualitative comparative analysis) focuses on investigating whether there are sufficient conditions within the fuzzy set composed of brand image, consumer opinion leadership, and perceived value that could lead to high word-of-mouth intention. This study adopts a quantitative research approach, using a questionnaire survey to collect empirical data through an online survey (Google Forms). The multivariate analysis tools used in sequence include descriptive statistical analysis, factor analysis, reliability analysis, SEM, and fsQCA. Results of SEM represent that strengthening brand image and consumer opinion leaders can help enhance perceived value, as well as improve consumer opinion leadership and perceived value both help strengthen word-of-mouth intention. Furthermore, results of fsQCA identify that there are three sets of sufficient conditions that can lead to high word-of-mouth intention.

Keywords:

Fuzzy Set, Brand Image, Consumer Opinion Leadership, Word-of-Mouth Intention, SEM, fsQCA.

Exploring the Impact of Cultural Heritage on the Cost of Equity in the Global Cement Industry

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Abstract:

There has been an increasing concern for corporations to connect their ESG disclosure with the achievement of Sustainable Development Goals (SDGs) as a global commitment. Cement industry is also joining this initiative by improving on the materiality issue related to the cultural and natural heritage. Investors have found that the cement industry has made a negative impact on the heritage due to the use of the land for the business. We aim to reveal the relationship between cultural and natural heritage issues to the investor's rate of return or cost of equity for the case of Cement and Cement-related industries around the world. This study employs a panel regression analysis for the periods of 2021-2022 and finds that our Cultural Heritage Index has a negative relationship with the cost of equity using several measures. Our results are robust after using subsample analyses by dividing the sample to high and low Cultural Heritage Index groups. Cement companies that integrate ESG principles, including cultural heritage protection, into their operations may attract socially responsible investors who are willing to accept lower returns in exchange for reduced social risks. As a result, firms with strong ESG performance may enjoy a lower cost of equity due to greater investor demand for their shares and a perception of lower risk.

Keywords:

Cement and Cement-related industries, panel regression analysis, Cultural Heritage Index, ESG performance, SDGs.

Solidification Paths of Al-Cu-Sn Alloys: Comparison of Thermodynamic Analyses and Solidification Experiments Using in Situ X-Radiography

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Abstract:

The Al-Cu-Sn alloys represent a new candidate material for the self-lubricating bearings manufacturing in the automotive industry. The addition of Sn to the Al-Cu binary alloy modified the solidification path of the ternary alloys and thus its microstructure. In this study, the solidification paths of Al-10 wt.% Cu-X wt.% Sn (with X = 0; 5; 10 and 20) alloys were investigated using three complementary approaches, namely: Thermo-Calc calculations, DSC (Differential Scanning Calorimetry) thermal analysis, and directional solidification experiments with in situ and real-time X-radiography were conducted to gain insight into the liquid phase separation dynamic. The qualitative results for the three methods demonstrated a high degree of correlation. For a low Sn addition (X = 5 wt.%), solidification path starts with α-Al dendrite formation, followed by θ-Al_2Cu precipitation, and ends with an eutectic reaction. The two alloys with higher Sn compositions (X = 10 wt.% and X = 20 wt.%) exhibit comparable dynamics at the outset of their solidification paths with low Sn composition alloy. However, the formation of the primary α-Al phase is followed by liquid phase separation (nucleation and growth of Sn droplets in the melt) and a monotectic reaction before the final eutectic reaction.

Keywords:

Al-Cu-Sn alloys, Thermo-Calc, solidification microstructures, liquid phase separation, monotectic, DSC, in situ radiography.

Understanding Tourists` Behavior Regarding Sustainable Destinations in Portugal: An Application of the Theory of Planned Behavior

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Abstract:

In recent decades, Portugal, a country in the southwest of the European continent whose territory comprises a continental part and two archipelagos, has been asserting itself as one of the most competitive tourist destinations in Europe. Tourism is, in fact, a crucial activity of strategic importance to the Portuguese socioeconomic development, being responsible for generating significant amounts of revenue, creating jobs, business opportunities, and boosting different regions, both in the interior and on the coast of the country. As a result of several critical sustainability challenges, namely population growth, resource scarcity, food insecurity, climate change, biodiversity loss, and pollution, there has been an evident growing global awareness of the urgent need to respect the environment and empower local communities, which resulted in a greater incentive for the development of sustainable tourism. Meanwhile, with the COVID-19 pandemic, responsible for causing significant socioeconomic impacts worldwide, the tourism sector had to reinvent itself, emerging in a more sustainable way. In fact, it was observed that during and in the post-pandemic period, characterized by some periods of social distancing and greater proximity to nature, tourists became more attentive and concerned with the tourism economic, social and environmental impacts, both for the current and the future generations. In addition to a greater demand for more sustainable hotels, tourists are also more concerned with their travel impacts, seeing an increase in the number of tourists who are willing to pay more for more environmentally friendly means of transport. This research study explores the tourists' behavior towards sustainable destinations in Portugal, through the application of the Theory of Planned Behavior and with the information collected through an online questionnaire. The results reveal that tourists` intention to visit sustainable destinations in Portugal is influenced by their attitudes, subjective norms, perceived behavioral control and sustainability awareness. Regarding the tourists` consumption behavior of sustainable destinations, this is influenced by their intention and perceived behavioral control, despite the existence of an intention-behavior gap. The results also concluded that tourists are willing to pay for sustainable destinations in Portugal.

Keywords:

Tourism; Sustainability; Theory of Planned Behavior; Portugal.

Influence of Environmental Conservation Waste Reduction Practices on Business Performance of Small and Medium Enterprises in Eldoret Municipality

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Abstract:

The growth of Small and Medium Enterprises (SMEs) in Kenya has witnessed an upward trajectory growth thereby triggering significant effects on the environment. SMEs in Eldoret face multiple challenges, including inadequate access to financing, lack of proper training, and ineffective management practices and this complicates their priority action on environmental conservation. Therefore, this study sought to assess the influence of environmental conservation waste reduction practices on business performance of Small and Medium Enterprises in Eldoret Municipality. This study was anchored on the Institutional theory. This study employed a descriptive correlational research. The target population was 2053 owner/managers while sample size was 335 respondents from registered SMEs operating in the Uasin Gishu County. The study used cluster sampling technique to select the SMEs. Questionnaires were used in data collection. Data were analysed using descriptive statistics and inferential statistics. The analysed data were presented in form of tables. The study findings revealed that environmental conservation waste reduction practices had a positive linear effect on business performance of Small and Medium Enterprises (β_1=0.209, p=0.001). The study concluded that waste reduction practices have a significant positive influence on business performance of Small and Medium Enterprises. SMEs should implement comprehensive environmental training programs for their employees to enhance resource management, compliance with environmental regulations, and strengthen the company's brand image.

Keywords:

Environmental conservation, waste reduction practices, business performance, small and medium enterprises, Eldoret municipality.

Delphi Technique in Digital Transformation towards Innovative Learning Readiness

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Abstract:

Objectives: Covid-19 Many institutions' long-term wish lists were transformed overnight into critical needs. As a result, innovative learning factors have become an essential component of digital transformation, which includes learning, learning to learn, and assisting students in developing a growth mindset belief system about their abilities. As a result, the successful application of innovative learning is dependent on students' readiness to learn in a new baseline. The purpose is to gather expert-based judgments and use them to find consensus. The use of Delphi techniques in digital transformation is to discuss the results' processes. The findings of this study are articulated and examined methodologically using systematic reviews of Delphi techniques.

Methods: Five Delphi technique systematic reviews from higher learning institutions were identified and thoroughly examined.

Results: Five systematic reviews show that Delphi studies are typically completed in two to three sets, with the chosen panel of experts monitoring the process. As a result, several revisions to the Delphi technique are now in place.

Conclusion: Based on the findings, it is clear that additional research is required to shed light on the methodological approaches and modifications to Delphi techniques. Aside from that, it's also important to explain what specific criteria are used to assess the quality of their implementation and reporting. This model is expected to serve as a future reference for institutions of higher learning in understanding and appreciating the design thinking approach and ICT aspects when assessing readiness for innovative learning.

Keywords:

Delphi techniques, digital transformation, higher Learning Institutions, innovative learning, design thinking approach.

Knowledge Management and Operations of the Independent National Electoral Commission (INEC) in Nigeria

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Abstract:

Electoral processes worldwide face numerous challenges that compromise their transparency, and voters' engagement. The study determined the effect of knowledge management practices on the transparency of electoral processes within INEC and voter engagement in Nigeria. The analysis demonstrated that knowledge management practices—Socialization, Externalization, Combination, and Internalization—significantly influence both aspects. For transparency, the findings revealed that effective knowledge management practices contribute positively, with Externalization having the most substantial effect. This indicates that converting tacit knowledge into explicit forms and ensuring its accessibility is crucial for enhancing transparency in electoral processes. The results underscore the importance of robust knowledge documentation and sharing practices in fostering transparent operations within INEC and voters' engagement in Nigeria.

Keywords:

Knowledge management, knowledge management practices, transparency and voters' engagement.

Investigation of the Effect of Effect of Absorber Layer Density, Hole Carrier Layer (HTL), Electron Carrier Layer (ETL) and Conduction Band (CBO)-Valence Band (VBO) Offset on Perovskite Solar Cell Performance: A Simulation Study by SCAPS

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Abstract:

The significant growth of perovskite solar cells (PSCs) in the recent decade and the outstanding electrical and optical properties including appropriate and tunable band-gap, high absorption coefficient and low exciton-binding energy as well as low-cost processing attract the attention of researchers around the world.

In just a short period the perovskite photovoltaics especially the lead-based types achieved very high power conversion efficiency (PCE) of 25.7% compared with other one junction solar cell technologies, and consequently emerged as a suitable contender in the future of photovoltaic market. However, the environmental concerns about lead-based perovskites due to the high toxicity of lead, besides the instability of PSCs in ambient environment impedes the procedure of commercialization.

Therefore, it is important to look for the metal elements that have similar electronic characteristics like Pb to be able to produce a stable nontoxic perovskite solar cell. A number of publications have mentioned this issue by substitute Sn and Ge instead of Pb in perovskite structures as an absorbing layer. This replacement solves the instability against moisture and toxicity problem; however, it also limits the device performance significantly. In addition, the using of formamidinium (FA) instead of methylammonium (MA) in perovskite structure has enhanced the problem of moisture instability, but the reason why this type not suitable in the long run is the fact that FAPbI3 suffers from two different phases at room temperature. On the other hand, another way has been addressed in literature to improve the instability issues of perovskite is the incorporation of inorganic cesium (Cs) into perovskite compositions with MA and FA.

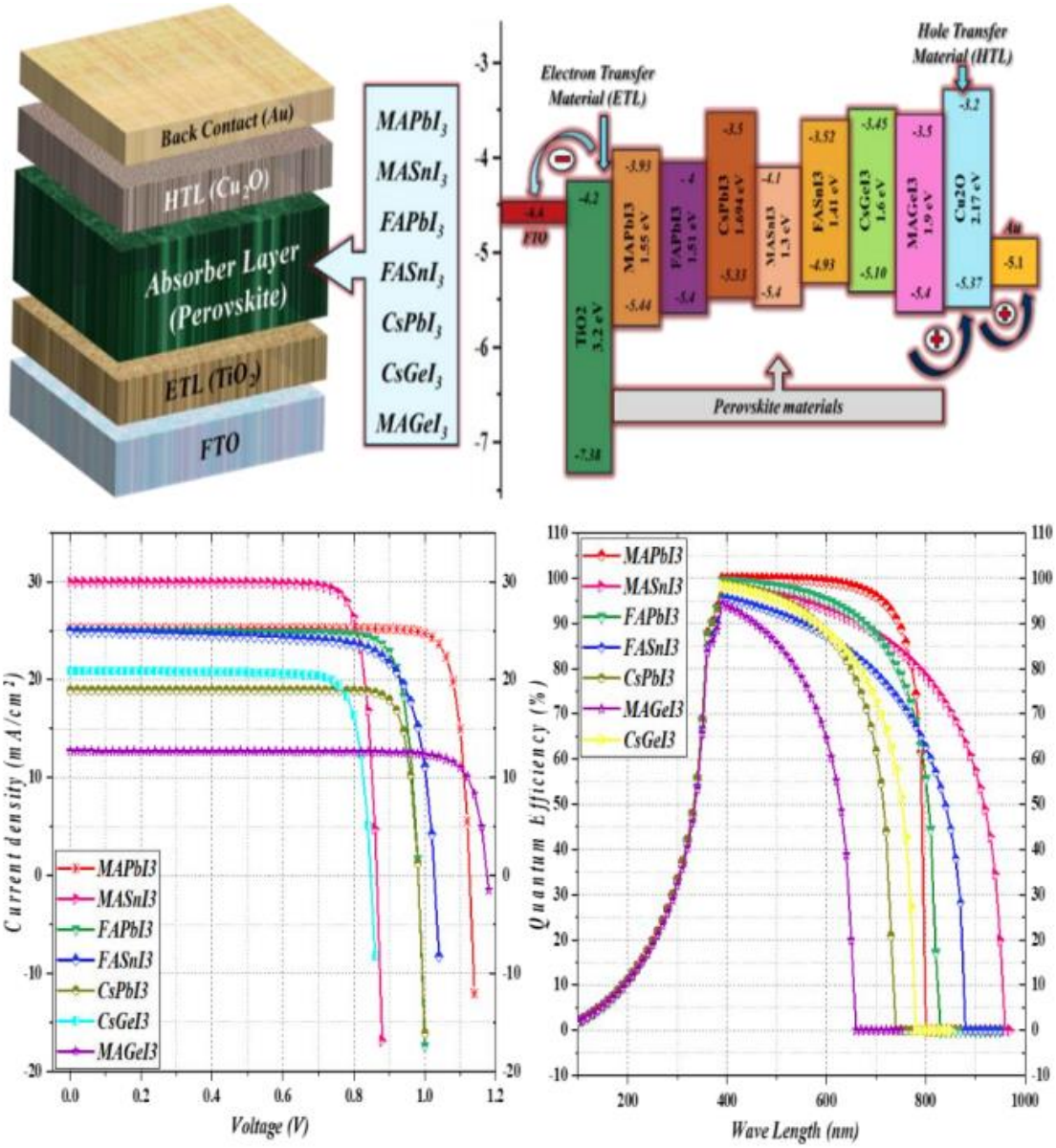
This new class of perovskite material has attracted great interest from researchers to investigate its additional properties and enhance the performance of PSCs along with stability.

In this work, a comparative simulation study was carried out for three lead-based MAPbI3, FAPbI3 and CsPbI3 and four lead-free MASnI3, FASnI3, CsGeI3, and MAGeI3 as absorbing material in PSC while Cu2O and TiO2 used as Hole Transfer Layer (HTL) and Electron Transfer Layer (ETL) respectively. The aim of this work is to investigate the effect of different factors on the PSC performance and therefore optimize the devices depending on the simulation results. The effect of thickness of the absorber layer, defect density, the ambient temperature, the parasitic resistances including series and shunt resistances, the back contact metal and CBO and VBO on the PSC performance have been presented.

Keywords:

Perovskite solar cells, lead-based perovskite, lead-free perovskite, SCAPS-1D.

Graphical Abstract:



Procrastination in Virtual Classrooms: A Qualitative Study of Distance Learners' Experiences

Robert White

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Abstract:

This study investigates academic procrastination among postgraduate distance learners, an underexplored area in current research. Through qualitative interviews and Thematic Analysis, we examined participants' experiences, uncovering three overarching themes: Perception, Reasons, and Reflection of academic procrastination in distance learning contexts.

Our findings reveal that participants frequently engaged in procrastination, primarily due to challenges in maintaining study-life balance. Interestingly, despite their procrastination tendencies, participants reported overall satisfaction with their academic performance. They often viewed procrastination as a conscious choice, prioritizing other life commitments over immediate study tasks.

The study highlights the significant influence of external factors on procrastination behavior in distance learning environments. Results indicate that academic procrastination is prevalent among distance learners, with study-life balance emerging as a key predictor. The satisfaction expressed by participants regarding their academic achievements suggests that procrastination may be a strategic decision rather than a mere lack of time management skills.

This research underscores the need for tailored interventions addressing procrastination in distance education settings, taking into account the unique challenges and motivations of remote learners. It also calls for a nuanced understanding of procrastination that considers the complex interplay between academic demands and personal responsibilities in distance learning contexts.

Keywords:

Academic procrastination, distance learning, postgraduate students, thematic analysis, study-life balance

Foreign Accent: An Approach from Top-Down and Bottom-Up L2 Pronunciation Instruction

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Abstract:

This article examines the constructs of accent and foreign accent, considering native / non-native dichotomy. In this respect, we discuss pronunciation instruction from bottom-up and top-down orientations, linking it to the aforementioned dichotomy. Finally, we concluded with advice for pronunciation instructors interested in moving away from the native / non-native dichotomy.

Keywords:

L2 pronunciation, pronunciation instruction, foreign accent.

Public Health Education and Career Pipeline Development for HBCU and Community College Students

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Abstract:

Public health sectors are experiencing an unprecedented workforce crisis, especially after the COVID-19 pandemic. Public health education plays a crucial role in promoting community well-being and addressing health disparities, especially within historically marginalized populations. In order to address health inequities and promote community well-being, public health education is essential, particularly for historically disenfranchised populations. Historically Black Colleges and Universities (HBCUs) play a critical role in providing educational opportunities for African American students and members of underprivileged communities. By preparing them for careers in the workforce, HBCUs help close the skills gap in this industry.

This abstract encompasses three interrelated topics: public health education programs, career development, and the introduction of an associate degree program in public health and information technology. All three topics converge at only HBCU in the nation's capital. Public health education at HBCUs equips students with the skills and knowledge to tackle pressing health issues while addressing the socio-economic and cultural factors that contribute to health inequities. These programs provide a robust platform for career development, offering pathways into public health professions through mentorship, internships, and partnerships with healthcare organizations. Moreover, the emphasis on culturally competent care and community-based initiatives prepares graduates to advocate for health equity and lead transformative changes in public health policy. HBCUs play a critical role in developing the next generation of public health professionals, empowering students to contribute to the well-being of their communities while advancing their careers in public health sectors.

Testing for Reversed Language Dominance Effect in Bulgarian-English Bilinguals: Evidence from Read-Aloud Task

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Abstract:

Bilinguals are typically more proficient in one language that is regarded as their dominant language (L1). Speech in the dominant language is characterized with frequent usage, faster retrieval of lexical items, and fewer errors relative to the non-dominant language (L2). But when bilinguals are cued to switch back and forth between languages, dominance sometimes reverses—in this context bilinguals demonstrate better performance in their non-dominant compared to their dominant language, a phenomenon known as reversed language dominance effect. This unusual pattern has been replicated in bilinguals of many different language combinations and in a number of tasks. The results, however, are not consistent across studies and there is a limitation of language variety. The current study turns to the Bulgarian-English language pair, which represents linguistically and typologically distant families: Slavic and Germanic. Speech production was elicited by asking 48 Bulgarian dominant Bulgarian-English bilinguals to read aloud mixed-language paragraphs with high frequency switching. The switch words were separated by target language (Bulgarian vs English), switch type (switch back to the default language vs switch out of the default language), and part of speech of the switch word (content vs function). Switching difficulty was measured by production of cross-language intrusion errors on the switch words (e.g., mistakenly saying *door* instead of ***врата*** when reading: ***На входната door се почука)***. All participants were Bulgarian dominant, but they produced more intrusion errors when switch words were written in their dominant language than in their non-dominant language (i.e., they exhibited reversed language dominance effect).

Keywords:

Bilingualism, inhibition, reading aloud, intrusion errors, reversed language dominance effect.

Clinical Nutrition

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Abstract:

The research and comprehensive examination of the connection between consumed food with the general health of the human being is known as clinical nutrition. Nutritionists are in charge of evaluating an individual's dietary requirements, with a focus on the ways in which these nutrients get into the body, stored, metabolized, transported, digested, and used both before and after they are expelled as waste. It describes the area of medicine that works with people to battle their illnesses by implementing a diet that is well-balanced and appropriate nutrition. To put it another way, clinical nutrition is when a healthcare professional examines a patient's entire diet to see if they are getting enough nutrients from their regular foods. Clinical nutrition places a significant priority on identifying and preventing the occurrence of nutritional alterations among patients who may be at high risk of developing chronic illnesses, in addition to managing nutritional alterations. This abstract offers insights into clinical nutrition and how important it is for maintaining optimal health as well as for managing treatment, and prevention of disease. Throughout the life cycle and wherever in the world, having access to a nutritious and sustainable food is essential. Yet there is a complicated, dynamic, and multidimensional connection between food, nutrition, and health that is greatly influenced by biological, ecological, social, cultural, and behavioral factors. The abstract also includes the most recent research on the expanding challenges posed by factors such as insufficient access to nutritious foods, unhealthy habits, growing consumer demand, changing climates, and population expansion worldwide. Surprisingly, developed as well as emerging economies are dealing with the issue of rising rates of obesity and diet-related diseases (heart disease, diabetic complications, malignancies, hypertension, and arthritic conditions while 800 million individuals in developing nations suffer from prolonged malnutrition. This is mostly caused by altered eating habits, altered dietary types, and increasingly less active lifestyles. However, the abstract concludes by emphasizing the role that clinical nutrition plays in health. Clinical nutrition pertains to the diagnosis, treatment, and improvement of health by preventing diseases associated with diets. It also addresses disorders that impact the intake, digestion, and metabolism of dietary components.

Keywords:

Balanced Diet, Chronic Disease, Clinical Nutrition, Disease Prevention, Health Promoting, Metabolic Issues, Nutritional Support, Nutritional Assessment.

Interobserver and Intraobserver Variability in Assessing Lumbar Canal Stenosis on Magnetic Resonance Images

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Abstract:

Introduction: MRI is the most effective modality to diagnose spinal canal stenosis. There are several qualitative classifications for the severity of spinal canal stenosis. Until now, there has been no obvious association between the degree of stenosis on magnetic resonance (MR) images and patient clinical outcomes. The purpose of this study is to evaluate inter- and intra-observer among radiologists when classify the grading of spinal canal stenosis on MR images.

Methods: Seven radiologists blindly assessed 90 MR axial T2WI images of non-contrast lumbar examinations at level between L1-L2 and L5-S1 using Lee's criteria to determine the degree of lumbar spinal stenosis. Cohen's kappa coefficient was used for both interobserver and intraobserver analysis.

Result: On MR images, 360 lumbar disc levels were assessed for interobserver agreement and 55 levels for intraobserver agreement. Kappa values were 0.436 for interobserver and 0.452 on intraobserver, indicating fair agreement. The biggest interobsever intraobserver variation was found while determining the degree between normal and mild stenosis, 67.14% for interobserver and 65.21% for intraobserver, and second was determining mild with moderate stenosis 24.28% for interobserver and 17.39% for intraobserver.

Conclusion: The data showed moderate agreement between and among radiologist, with the highest variation in detecting the adjacent degree, particularly between normal and mild stenosis. Further research is needed to determine the lumbar spinal stenosis on quantified MR images, in order to assist the radiologists reach an agreement when analysing MR images in lumbar spinal stenosis.

Keywords:

Intraobserver, Interobserver, Lumbar spinal stenosis, MRI.

Tracking Transformation: A Decade of Consumer Behaviour in India

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Abstract:

Over the past decade, India has undergone significant socio-economic transformations that have profoundly impacted consumer behaviour patterns across various demographic segments. This research presents a systematic analysis to trace the evolution of consumer behaviour in India over the past ten years. As India has experienced significant socio-economic changes, including rapid urbanization, digitalization, and shifts in income distribution, understanding these transformations is crucial for businesses and policymakers.

The study employs a comprehensive review of existing data sources, including market reports, government publications, and academic studies, to map key trends and shifts in consumer preferences, spending patterns, and purchasing behaviours. By synthesizing data from diverse sources, the research identifies notable patterns such as the rise of e-commerce, the influence of social media, and changes in consumer values towards sustainability and health. The findings highlight how demographic changes, technological advancements, and economic developments have collectively reshaped the Indian consumer landscape. This decade-long analysis provides valuable insights into emerging market segments and offers strategic recommendations for businesses seeking to navigate the evolving consumer environment in India.

Overall, the paper contributes to a deeper understanding of the dynamic nature of consumer behaviour in one of the world's fastest-growing markets, offering a critical resource for stakeholders aiming to leverage the opportunities presented by India's transforming consumer base.

Keywords:

Consumer Behaviour, India, Digital Transformation, E-commerce, social media, Economic Shifts, Sustainability, Market Trends.

Environmental Impact Reduction through the Utilization of Organic Waste for Carbon Quantum Dot-Based Serotonin Sensing

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Abstract:

Serotonin is an essential neurotransmitter for mood regulation as well as cognitive functions. The highly selective detection of serotonin plays an important role in neuroscience studies and clinical diagnosis. Many studies have been carried out in recent years on the detection of seratonin. But especially the use of nanostructured materials as one of the components of biosensors has become very popular. Nanowires, nanocages, nanoparticles, and quantum dots (QDs) as nanomaterials are among the most frequently used materials in biosensor applications. Among the most important reasons why quantum dots are frequently preferred are their large surface area, additionally QDs possess unique excellent optical properties and chemical properties, including broad excitation spectra, adjustable particle sizes, superior signal brightness, and extended fluorescence lifetime. their functionalization, and their interaction with light.

Herein, we report the synthesis, characterization and biosensor applications of organic waste material-based carbon quantum dots (CQDs) from two different organic waste materials. Watermelon and orange peels were used as carbon sources for the synthesis of CQDs. CQDs were prepared using microwave-assisted techniques (MW) and hydrothermal methods to achieve a fast route at low cost. The synthesized CQDs were characterized using UV-Vis spectroscopy, scanning electron microscopy (SEM), dynamic light scattering (DLS) and Fourier-transform infrared spectroscopy. The obtained CQDs were used for the detection of serotonin by UV-Vis spectroscopy. The preliminary results are very promising and clearly demonstrate that CQDs from organic waste compounds can be used for UV-Vis selective detection of serotonin. This work is pioneering for neurological studies in sustainable manufacturing, advanced nanomaterial synthesis and the development of eco-compatible sensing strategies from research to healthcare.

Ablation Studies of KRAS in Colon Cancer: Predictive Power and Diagnostic Accuracy

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Abstract:

Colorectal cancer (CRC) ranks as one of the most prevalent malignancies globally, with nearly 1.9 million new cases diagnosed annually. Colorectal cancer is due to multiple genetic and environmental factors. Of all genetic mutations, the KRAS and non-KRAS mutated genes have been proven to be two of the most common in the prediction and treatment of CRC. This research analyzes the ability to predict and the diagnostic accuracy of not only the KRAS gene mutation, but particularly the exon 2 mutation in CRC, using convolutional neural network models. Our analysis of 1,120 radiological images from the Cancer Genome Atlas, as well as the Cancer Imaging Archive, into increasing the diagnostic prowess and treatment planning for the patients with CRC, evidenced that CNN models predicted a presence of KRAS in CC 0.82 and the absence of KRAS in CC 0.78. Further, the presence of the KRAS mutation increased the accuracy of the model to 0.81 for the detection of colon cancer. This study emphasizes the potential of KRAS as a biomarker for personalized medicine and the connections between KRAS and non-KRAS gene mutations that have important implications for CRC prognosis and treatment resistance.

Keywords:

Colorectal cancer, KRAS mutation, convolutional neural network, radiology images, predictive modelling.

Optimizing Control and Energy Management in a TS Fuzzy Wind System unsing LMI Approach

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Abstract:

The main focus of this research is to develop an optimal control and management strategy for wind energy systems. To achieve this goal, the study uses a combination of control design methods, including the Lyapunov function, sliding mode observer (SMO), and a PDC (Parallel Distributed Compensation) structure. These methods are employed to optimize the control of the wind energy system, ensuring that it operates at its maximum power output. To implement the control design methods, the wind turbine model is linearized using the Takagi-Sugeno (TS) fuzzy model. This allows the researchers to apply the linear matrix inequality (LMI) optimization algorithm to find a common solution that guarantees the asymptotic stability of the system. The objective of the proposed control design method is not only to extract the maximum power from the wind system but also to regulate the energy supplied to various loads and protect the battery against overcharging and deep charging. This is achieved through a global management strategy that is implemented in the state-flow. The simulation results of the proposed control and management strategy demonstrate its effectiveness in regulating the energy supplied by the wind system and protecting the battery. This research contributes to the development of more efficient and reliable wind energy systems, which are crucial in the shift towards sustainable and renewable energy sources.

Keywords:

Wind generator system, Management energy system, Takagi Sugeno fuzzy model, sliding mode observer (SMO), linear matrix inequality (LMI).

Improving Speaking Skill through Instruction in Oral Classroom Participation

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Abstract:

Human beings are in continuous communication and interaction with each other. Language is a method of communication used by humans to express their thoughts, ideas and feelings. It is a way to communicate in social interactions which have essential social roles.

This study deals with improving speaking skills through instruction in oral classroom participation. Speaking as other language skills has a key role in helping language learners to learn a foreign language. Speaking is considered as a productive skill than a receptive one, in which the speaker gives information rather than getting information as in reading and listening.

The study is deals with speaking skill, the components of speaking skill (speakers, listeners, and utterance), Factors Influencing Speaking Skill (cognitive, linguistic, affective, interactions, and lack of motivation), ways to Improve Students' Speaking Skill in Oral Classroom.

Keywords:

Speaking skill, utterance, interaction, communication, and instruction.

Hungarians Scouts in Australia. Presence and Cultural Diplomacy Activities from the Beginning to the Present

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Abstract:

Although Hungary has a population of less than 10 million, an estimated 5 million Hungarians live outside its borders, dispersed across the globe. The Hungarian diaspora is notably large and actively sustains its cultural heritage and the transmission of its identity to future generations through various organizations. In addition to weekend Hungarian community schools and folk dance groups, scout groups play a key role in this cultural preservation. The Hungarian Scouts abroad are united under the Hungarian Scout Association in Exteris (HSAE) and organise a varity of events, large and small, where they present Hungarian culture to the majority society.

This is also the case in Australia, which is geographically a huge distance from Hungary. Many scout groups are active within the Hungarian emigrant communities, particularly in the country's largest cities such as Sydney, Melbourne, Adelaide, etc. Hungarian scouting in Australia was established after the Second World War in the 1950s and flourished for decades. Nowadays, with the ageing and assimilation of the local Hungarian population, the membership of Hungarian scout groups has declined, but even today they are still making an important impact in the preservation of Hungarian identity. However, they have organised a significant number of events where they have communicated the values of being Hungarian to the majority of Australian society.

In the first half of my presentation, I will provide a general overview of the development and global expansion of scouting. Then I will examine the history of Hungarian scouting, including the 4th World Scout Jamboree (1933) which was held in Hungary. Finally, I will explore the history of the Hungarian Scouts in Australia, with a particular focus on their cultural diplomacy activities, highlighting several large-scale events they have organized.

Keywords:

Scouting, jamboree, Hungarians in Australia, cultural diplomacy.

A Study of the Chemical Properties of the Kuwaiti Atmosphere

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Abstract:

Kuwait is a country in the Middle East located in the center of the global dust belt. There are vast deserts in the region, as well as a hot and dry climate. To explain in detail, the diversity of atmospheric states in Kuwait, the subsequent results were recovered for the atmosphere over Kuwait. This study uses the data of a number of fixed air quality monitoring stations (AQMS) belonging to Kuwait Environment Agency (KU-EPA) to give a thorough analysis of air pollution in Kuwait. The atmosphere over Kuwait shows an amalgamation of near-surface urban pollution and stirred-up dust aerosols. Troposphere and total column amounts of nitrogen dioxide (NO_2) and sulfur dioxide (SO_2) are determined from measurements at fixed air quality monitoring stations. The results also confirm the impact of emissions from oil and gas refining facilities and transportation into the atmosphere of areas of concern, emitting NO_2 and SO_2.

Keywords:

Air pollution, Troposphere, Kuwait’s atmosphere.

Effective Mass Approach and Media Effect in Nuclear Systems of Several Strong Interacting Particles

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Abstract:

Using realistic NN potentials, the binding energies of ^{3}H, ^{3}He, and ^{4}He are underpredicted by several MeV in the three- and four-nucleon systems [1]. A widely accepted solution to this issue is the introduction of a three-body force (3BF), which adjusts the calculated binding energies based on two-body interactions to match the experimental values. This discrepancy arises because nucleons are treated as point-like particles, neglecting their internal quark structure [2]. In other words, these few-body systems exhibit medium-like properties. In the present work we consider the effect of media for different few-body systems which is analogy to the properties taking place in many-body systems. The considering systems include three-nucleon (3N) and alpha-cluster (3alpha-particle) systems which is studied within effective mass approach. Based on mass-energy compensation of three-body Hamiltonian [3], we definite an effective mas of particles in the 3N system so that the mass changing is equivalent to additional energy coming from 3BF. In Fig. 1, the nucleon effective mass, m^*/m_0, was used to account for the energy shift equivalent to the known mass difference between the proton and neutron, as applied in the three-body calculation for the binding energy of ^{3}H [4]. The concept of particle effective mass will also can be used to address the issue of the three-body force in 3alpha-particle system as it was shown in [3]. Widely used in many-body and condensed matter physics, this concept adds multidisciplinary value to our study. For example, the anti-crossing of the low-lying levels in the ^{12}C nucleus, as shown in [5], demonstrates its applicability. A possible extension of the effective mass approach for systems of non identical particles is discussed.

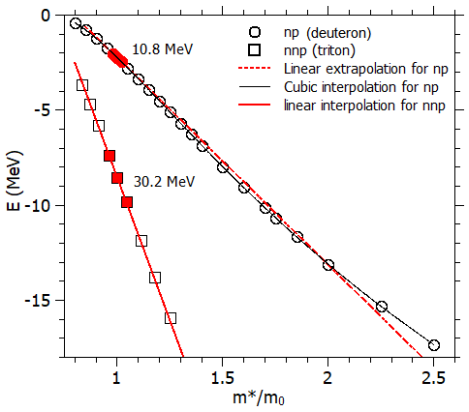

Fig. 1: The ground state energy E of the triton (nnp) (open squares) and deuteron (np) (open circles) as a function of the nucleon mass m*/m0. The black curve corresponds to the cubic fit for the energy-mass dependence, and the red dashed line gives the linear fit for the calculated energies shown by red symbols. The numbers indicated on the averaged kinetic energy.

Keywords:

Three-body Hamiltonian, Faddeev equations, three-body force, mass-energy compensation effect, effective mass.

Acknowledgement:

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Correlation of High-Risk Humman Papilloma Virus with Deep Endometriosis: A Cross-Sectional Study

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Abstract:

Background: Recently, it has been suggested that microbial infections play a role in the pathogenesis of endometriosis. One of the most commonly suggested infections is human papillomavirus (HPV) infection.

The goal of study is evaluating the prevalence, types, and risk factors for HPV infection in women with endometriosis and investigating the association of upper and lower genital tract involvement with HPV and severity of endometriosis.

Method: This cross-sectional study was conducted on 81 patients with endometriosis, referred to Rasool Akram hospital in Tehran, Iran, for laparoscopic surgery.

The stage of disease was scored based on the revised American Society for Reproductive Medicine (rASRM) classification. The HPV-positive and HPV-negative cases were compared using the chi-square test for categorical variables and Student t-test for continuous variables.

Results: Twenty (24.69%) out of 81women with endometriosis were infected with HPV (nine cases of pelvic HPV, nine cases of vaginal HPV, and two cases of both pelvic and vaginal HPV). The HPV-infected women had a significantly lower infertility rate (15% vs. 45.9%; P = 0:014).

The VAS scores for dysmenorrhea and dyspareunia were relatively the same in the two groups (P > 0:05). HPV 6 and HPV 11 were the most common types of HPV, reported in 35% and 30% of endometriosis cases, respectively.

Conclusion: The prevalence of HPV was 24.69%, and low-risk genotypes were dominant. No significant association was found between HPV and the severity of endometriosis.

Mitigation of the Consequences of Seroma Formation in Open Ventral Hernia Repair Using ECM Powder

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Abstract:

Seroma formation after surgical procedures is a common postoperative complication observed in a variety of surgeries, including breast surgery, abdominal surgery, hernia repair, and plastic surgery. The development of seroma in the context of open ventral hernia repair, especially in the high-risk categories, has been shown to contribute to persistent morbidity and jeopardize the integrity of the repair altogether. Thus, prevention and mitigation of the negative consequences of seroma must be prospectively evaluated to ensure optimal outcomes when undertaking ventral hernia repair. The incidence of seroma formation in patients undergoing ventral hernia repair is variable and reported at rates ranging from 0.5–78% after laparoscopic repair, and 30–50% after open repair. Surgical drains, pressure dressings and negative pressure wound therapy are just a few of the therapies utilized by surgeons in an attempt to prevent seroma formation with mixed results. Here we look at the benefits of incorporating a Multi-Tissue Platform (MTP) Wound Powder during the closure of complex open ventral hernia repairs. Our early experience using XCelliStem wound powder has revealed a promising trend, as we have seen a reduction in seroma and seroma-related complications from 49% to 16%. In conclusion, we recommend the consideration of a MTP to be included in the closure of complex ventral hernia repairs, as well as other operations at high risk for seroma formation.

Exploring Informal Caregivers' Contribution to Selfcare Practices of Hemodialysis Patients in Ghana. A Phenomenological Study

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Abstract:

Global statistics reveals 69% of patients receiving kidney replacement therapy receive hemodialysis. Selfcare of patients undergoing hemodialysis is essential and produces positive health output. However, hemodialysis patients do not practice enough self-care to the extent that their informal caregivers must come to their support. There is lack of literature exploring the contributions of informal caregivers to the selfcare practices of patients undergoing hemodialysis. The purpose of this study is to explore the informal caregivers' contributions to selfcare practices of patients undergoing hemodialysis in Ghana. Descriptive qualitative research design was employed. The study was conducted at Tamale Teaching Hospital and the 37 Military Hospital in Ghana. Fourteen caregivers of hemodialysis patients receiving care at the nephrology department were interviewed face-to-face using semi-structured in-depth interview guide developed based on the Situation-specific theory of Heart Failure selfcare. Data was analyzed manually employing thematic analysis. Three themes; Selfcare maintenance, Selfcare monitoring, and Selfcare management were generated with seven subthemes. The caregivers' contributions to the selfcare practices of hemodialysis patients lead to improve health outcomes, therefore, nurses need to acknowledge the importance of caregivers' contribution to patients' disease management and develop effective educational interventions to support them.