THEVELI

THE MALDIVES NATIONAL UNIVERSITY

THEVELI INTERNATIONAL CONFERENCE 2026

Transformative Innovation in the 21st Century: Science, Technology, and Society

17 - 19 AUGUST | The Maldives National University

ABSTRACTS

Theveli

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About Theveli Conference 2026

Theveli is a multidisciplinary research conference, held annually since 2017, with an overarching theme for each year. The theme for 2026 is "Transformative Innovation in the 21st Century: Science, Technology, and Society".
For this year, papers are categorized under the following sub-themes:

- Sustainable Futures and Climate Action
- Innovation, Technology, and Digital Transformation
- Science, Health, and Human Well-Being
- Global Governance, Peace, and Development
- Education, Knowledge, and Future of Work
- Gender, Equity, and Social Transformation
- Resilient Economies and Future Markets
- Interdisciplinary Research and Global Collaboration
- Artificial Intelligence, Ethics, and Human Futures
- Patient Safety and Healthcare Quality
- Metabolism of Islands - Advancing an Island Circular Economy for Climate Adaptation in SIDS

"Theveli" is a Dhivehi (Maldivian language) word which means rays spread on the sea (or water) at sunset or sunrise. The Maldives National University strives to spread rays of knowledge throughout the nation, region and beyond.

Keynote Speakers



Dr. Sean McMinn

Dr Sean McMinn is the Director of the Center for Education Innovation at the Hong Kong University of Science and Technology (HKUST) and an Adjunct Associate Professor in the Division of Emerging Interdisciplinary Areas. He leads institutional strategy and initiatives in digital education, including AI for education, AI literacy, and innovative pedagogy, with a focus on integrating emerging technologies into teaching, learning, and assessment. He has served on several international committees, including the AI and Education International Panel, the Digital Education Council, the Cyber-Physical Learning Alliance, and the Higher Education Planning Alliance (HEPA). His work in digital education has been recognised through multiple awards, including the 2024 Global MOOC and Online Education Alliance Award for AI Education, the 2016 SHSS Teaching Excellence Award, and the 2007 Teaching Innovation Award at HKUST. His research interests include educational technology, AI and digital literacies, and networked learning.



Professor Dr. Mohd Mizan Aslam

Dr. Mohd Mizan Aslam is a Professor of International Security Studies at the United Arab Emirates University (UAEU) in Abu Dhabi, UAE. He previously served as Professor of Security and Strategic Studies at the National Defense University of Malaysia (NDUM). Professor Aslam is also a Senior Fellow at the Global Peace Institute (GPI) in London, United Kingdom. He is also a member of the National Panel for Deradicalization in Malaysia. He previously held the position of Professor of Counter Terrorism Studies at the Naif Arab University for Security Sciences (NAUSS) in Riyadh, Saudi Arabia. Professor Aslam also serves as a member of the Board of Trustees of the Perdana Global Peace Foundation (PGPF). He is a Country Expert with the Middle East Institute (MEI) in Washington, D.C., USA, specializing in terrorism and extremism issues in Southeast Asia (SEA) and the Middle East and North Africa (MENA). His international academic appointments include visiting scholar positions at the University of Hawaii at Manoa (USA), Ibn Haldun University (Istanbul, Turkey), and Universitas Sultan Yusuf (Jakarta, Indonesia).



Dr. Hassan Shafeeq, MBBS, MD, MPH

Dr. Hassan Shafeeq is a Senior Consultant in Internal Medicine with over 30 years of clinical experience in the United States and the Maldives. He holds an MBBS from Tribhuvan University, Nepal, an MPH in Clinical Epidemiology from Johns Hopkins University, and an MD in Internal Medicine from Mount Sinai School of Medicine/New York University. His career has included appointments at the University of Minnesota Medical Center, University of California, Davis Medical Center, and St. Mary's Hospital, Arizona, where he specialized in hospital medicine, chronic disease management, and preventive care. Between 2015 and 2025, he maintained a private practice focused on preventive medicine, health screening, and healthy aging. He currently serves as a Senior Consultant in Internal Medicine at the Male' City Group of Hospitals, including IGMH, while also working as a Visiting Hospitalist at Northwest Medical Center, Arizona. His interests include preventive medicine, clinical epidemiology, cardiovascular risk reduction, healthcare quality improvement, and medical education.



Professor Alister Jones

Professor Alister Jones is Deputy Vice-Chancellor of the University of Waikato and currently leads international engagement and delivery with a strong focus on the Asia-Pacific regions including development of off-shore programmes and campuses. He is a former Dean of Education and was previously Research Professor and Director of the Wilf Malcolm Institute of Educational Research. He has managed and directed research projects that have informed policy, curriculum, and teacher development in New Zealand and internationally. His main areas of research are curriculum, teaching, learning and assessment and he has over 300 publications. In 2000, he was awarded the NZ Science and Technology Medal for his significant contribution to the development of technology education both nationally and internationally. Professor Jones also holds an Hon. Doc. from Kasetsart University in Bangkok.



Associate Professor Dr. Siti Aqlima Ahmad

Associate Professor Dr. Siti Aqlima Ahmad is an environmental biotechnologist and polar scientist at the Faculty of Biotechnology and Biomolecular Sciences, Universiti Putra Malaysia (UPM). She leads the EcoRemediation Technology (EcoRemTech) Laboratory, where her research focuses on environmental biotechnology, particularly bioremediation of hydrocarbon pollution using microorganisms from polar and tropical environments. Her work integrates microbial biotechnology, nanobiotechnology, and sustainable environmental remediation to address global pollution challenges. Dr. Siti Aqlima has published over 200 Scopus-indexed publications and actively collaborates with researchers across Antarctica, Asia, Europe, Africa, and South America. She serves as Malaysia's representative to the Scientific Committee on Antarctic Research (SCAR) Life Sciences Group and is a recipient of the Young Polar Scientist Award. Her research contributes to advancing innovative, nature-based solutions for environmental sustainability and global resilience.

Abstracts

A total of 316 abstracts were submitted for this year's conference. This year the number of accepted abstracts is 288.

Authors affiliated with institutions from Maldives, Australia, Bangladesh, Belgium, Canada, China, Egypt, Germany, India, Japan, Latvia, Malaysia, Mauritous, Nigeria, Pakistan, Palestine Authority, Saudi Arabia, Slovakia, South Africa, Sri Lanka, UK, US, Reunion and New Zealand will present their papers at this conference.

This year's abstracts are compiled in the following pages, arranged by sub-themes 1 to 11.

Sub-theme 1: Sustainable Futures and Climate Action

31 Abstracts



Beyond Measurement: Reframing Climate Loss and Damage as a Social Process in Island Contexts

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Sasakawa Peace Foundation

Loss and damage (L&D) have emerged as a central pillar of global climate governance, yet its assessment remains dominated by event-based, economically oriented, and technocratic approaches. Such frameworks, while valuable for standardization, often fail to capture the cumulative, socially embedded, and interpretive dimensions of climate impacts, particularly in small island and coastal contexts. This paper reconceptualizes L&D as a processual and socially mediated phenomenon, rather than a discrete outcome of climatic events. Building on a layered framework encompassing material, relational, and interpretive dimensions, the study develops CLiX (Climate Loss Indexing through Cross-Layered Exploration) as a process-based methodological approach that integrates quantitative indicators with participatory and qualitative methods. Empirically, the paper draws on mixed-methods field research from coastal Sri Lanka, including household surveys, focus group discussions, and participatory mapping. The findings show that climate-induced losses are not only material but are shaped by structural livelihood dependencies, unequal access to resources, and historically mediated interpretations of risk and damage. Non-economic losses such as psychological distress, identity erosion, and altered sense of place remain under-recognized, while existing inequalities shape differential exposure and recovery. The paper makes three contributions. First, it advances a process-based reconceptualization of L&D, emphasizing temporality and cross-layer dynamics. Second, it demonstrates how loss is socially produced and unevenly distributed, extending relational approaches to vulnerability. Third, it introduces CLiX as a methodological reorientation that bridges measurement and meaning through integrative and participatory assessment. By moving beyond technocratic measurement toward a more holistic understanding of loss, the paper contributes to ongoing debates on climate justice, resilience, and adaptation, with implications for more equitable and context-sensitive L&D policy and practice. This paper, developed as part of the project "Enhancing Connectivity and Resilience: Assessing Climate-Induced Economic and Non-Economic Losses and Damages in the Indian Ocean Island Nations," aims to generate evidence-based insights into the multifaceted impacts of climate change on small island states in the Indian Ocean region, encompassing both economic and social dimensions

Keywords: *loss and damage, Indian Ocean SIDS, climate justice, non-economic loss and damage, participatory method*

Groundwater Quality Degradation and Water Security Risks in Malé City, Maldives: Implications for Climate Resilient Urban Systems

Shazla Mohamed[1], Shuaib Rasheed[1], Simron Singh[2], Kumaraswamy Ponnambalam[2], Mohamed Azhan Fawaz Shareef[1]

1. The Maldives National University 2. University of Waterloo

Small Island Developing States (SIDS) face increasing water security challenges due to limited freshwater resources, rapid urbanisation and inadequate infrastructure, particularly pronounced in densely populated urban centres. This study evaluates groundwater quality in Malé City and its implications for socio-metabolic risks in a desalination-dependent urban system. Ground water samples (n=27) were collected from randomly selected locations between Dec2025 - Jan2026 and analysed for physiochemical and microbiological parameters. Spatial mapping was used to visualise patterns and contamination hotspots. Results indicate that average salinity related parameters (EC=493.41 ◎s/cm, TDS=320.19 mg/L, Chloride=212.89 mg/L, Salinity=0.20 PSU) were within acceptable limits. However, elevated levels in the SE part of the island points to localized brackish conditions and possible saltwater intrusion. Average nitrate (5.34 mg/L) and nitrite (0.13 mg/L) concentrations were well within standards whereas ammonia levels were significantly elevated (mean=1.37 mg/L). High ammonia levels in the NW and SE areas of the island suggest localized recent sewage contamination. Detection of Total coliforms (82%) and Faecal coliforms (78%) confirm significant faecal contamination, possibly from sanitation leakage. Most groundwater samples were classified as poor or very poor with 15% deemed of unsuitable quality. Overall findings indicate that the groundwater lens which still forms part of the urban water metabolism is degraded due to salinization and sewage contamination. This creates socio-metabolic risks, including increased reliance on desalination, public health threats and disruption of urban water-waste cycles. Strengthened management strategies and policy interventions are essential to protect this important supplementary resource for long term urban water resilience.

Keywords: *Ground water quality, water security, salinization, contamination, Maldives*

Developing Climate Resilience at Grassroots Through NbS and Passive Design

Mahendra Gooroochurn
University of Mauritius

The effect of climate change has had profound impacts on our ecosystems, worsened by disruption of these very natural systems through anthropogenic activities. Two of the major climate-induced consequences have been a progressive degradation of the indoor environmental conditions and increased rainwater run-off. It is simply not sustainable to rely solely on neighbourhood or district level measures devised by the central governmental or local authorities to mitigate these problems; grassroot measures should be the first priority. This paper presents a case study for the tropical context of Mauritius, where harsher climate extremes and the occurrence of flash floods have been observed. The work is inspired from the circular homes concept based on an energy-water-materials nexus for community empowerment for climate action. The results obtained with passive design techniques such as roof shading and ventilated walls are reported, as well as with ground mounted solar chimneys for naturally ventilated spaces. Controlling heat gains at source and ensuring proper air flow between the interior and exterior contribute massively in yielding comfort to the occupants. Considering the problem of impermeability leading to surface rainwater run-off, this paper presents the possibilities for dealing with rainwater run-off at household level using nature-based and nature-reinforcing solutions, achieving co-benefits such as reduced potable water demand, while significantly improving the resilience of communities to flash floods.

Keywords: *Climate Adaptation, Sustainability in the Built Environment, Passive Building Design, Thermal Comfort, Rainwater Management*

Is Fiji's Transport System Climate Resilient? A Socio-Metabolic Risk Assessment

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Transport and transport systems underpin socio-economic development, intra- and inter island connectivity, and access to essential services. These functions are especially critical in Small Island Developing States (SIDS), such as Fiji, as they face distinctive sustainability challenges due to compounding biophysical and socio-economic constraints. While climate discourse often centres on decarbonisation, the substantial long-lived material stocks embedded in transport infrastructure, and the growing resource demands required to sustain them, remain underexplored. This study presents the first comprehensive material stock and flow assessment of Fiji's transport infrastructure network. Using a bottom-up, stock-driven flow approach with spatially explicit data, Fiji-specific construction specifications, and government reports, we quantify 2025 stocks of concrete, steel, bitumen, aggregate, crushed rock, timber, and geotextiles. Material flow projections to 2050 and 2100 incorporate network expansion and climate-driven maintenance based on fluvial and pluvial flooding, cyclones, and coastal inundation, with annually adjusted hazard intensities. Total material stock was estimated at 180 Mt in 2025, dominated by crushed rock. On average, annual flows accumulate about 780 Mt of stocks by 2050. By 2100, these accumulated stocks reach 20 Gt, due to the large predicted increase in hazard impact by the end of the century. Our findings show that growing transport infrastructure pressure and escalating material demand deepens debt dependency, environmental fragility, and socio metabolic risk. The transport system also risks sudden system failures that could isolate communities and cut prolonged access to services and aid, underscoring the urgent need for climate-adaptive design and proactive resource planning in Fiji and across SIDS.

Keywords: *Transport Infrastructure, Material Stock Analysis, Climate Adaptation, Socio Metabolic Risk, Small Island Developing States*

Storm Water Management Model (SWMM) for Male'

Shuaib Rasheed, Ahmed Mizan Abdul Hannan, Shazla Mohamed, Hassan Shiraz
The Maldives National University

Malé, the capital city of the Maldives, faces increasing urban flood risk due to rapid urbanisation, limited land availability, ageing drainage infrastructure, and the intensifying impacts of climate change. These factors have significantly increased the city's vulnerability to extreme rainfall events and surface flooding. This study evaluates the performance of Malé's existing stormwater drainage system using the Storm Water Management Model (SWMM), a widely applied tool for urban hydrological and hydraulic analysis. The study builds upon the existing SWMM-based frameworks for Malé by refining the drainage network representation and incorporating updated Intensity–Duration–Frequency (IDF) curves to simulate current and projected rainfall conditions. Model simulations were conducted to assess runoff generation, drainage capacity, and system behaviour under high-intensity rainfall events. The findings indicate that the current stormwater drainage system is insufficient to handle both present and future rainfall extremes. Several drainage segments were observed to experience surcharging and capacity exceedance during peak rainfall, leading to localised flooding in low-lying urban areas. The analysis further highlights critical bottlenecks within the drainage network, exacerbated by limited pipe capacity and constrained outlet conditions. The SWMM model developed provides a robust and integrated framework for assessing stormwater system performance in highly urbanised island environments. The results demonstrate an urgent need for drainage system upgrades and climate-resilient stormwater management strategies in Malé. This study contributes valuable insights for urban flood mitigation planning in Small Island Developing States (SIDS), where effective, data-driven infrastructure planning is essential for long-term climate adaptation and urban resilience.

Keywords: *Urban flood risk, Storm water drainage, Storm Water Management Model (SWMM), Small Island Developing States (SIDS), Male', Maldives*

Conservation Implications of Shifting Sea Turtle Management in Maldives: Lessons from L. Gaadhoo

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The study examines historical and contemporary sea turtle governance in L. Gaadhoo, Maldives, focusing on the transition from community-based management of turtles and their eggs to state-imposed protection and its implication for conservation effectiveness. Prior to the 2006 ban on egg harvesting, eggs functioned as a common-pool resource managed through local institutions, including the island office, Island Development Committee, and Women's Development Committee. Community members regulated access to the main nesting beach, selectively harvest eggs, protected nesting females, and left a proportion of nests undisturbed for hatching, while using auction revenue for communal development. Following the ban, local access and authority for management was removed, and participants reported a decline in community stewardship, increased illegal take of sea turtles and their eggs, and reduced nesting activity. Using qualitative methods, the study interprets these changes through Elinor Ostrom's Common Pool Resource theory and James C. Scott's concepts of Weapons of the Weak. Comparative analysis with studies from Costa Rica and Malaysia shows similar patterns where exclusionary conservation weakened local compliance, while systems linking conservation with livelihood strengthened stewardship. The findings suggest effective sea turtle conservation depends on legitimacy, local participation, and community ownership.

Keywords: *Sea turtles, local resource management, conservation, egg harvest, illegal take*

Biodiversity Conservation Challenges in Coastal Bangladesh: The Role of Marine Spatial Planning

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Click or tap Coastal Bangladesh includes important ecosystems such as mangroves, estuaries, and nearshore marine habitats, which support rich biodiversity and provide livelihoods for around 35–40 million people in coastal districts. However, these ecosystems are increasingly threatened by human activities and climate change. Rapid expansion of fisheries, shrimp aquaculture (covering over 275,000 hectares), ports, tourism, and offshore development has placed significant pressure on natural resources. Climate impacts, including salinity intrusion affecting about 53% of coastal areas, coastal erosion, and frequent cyclones, are accelerating ecosystem degradation. A major challenge is the lack of an integrated spatial planning system to manage competing uses of coastal and marine areas. This study addresses three key questions: what are the main drivers of biodiversity loss, how do spatial interactions among different coastal activities increase environmental pressure, and how can Marine Spatial Planning (MSP) support biodiversity conservation? Using a mixed-method approach that includes spatial analysis, policy review, and assessment of sectoral activities, the study finds that habitat degradation, overexploitation of resources, unplanned development, and weak institutional coordination are the main causes of biodiversity decline. It also shows that overlapping activities, such as fishing, shipping, and industrial use in the same areas, intensify ecological stress. The study concludes that MSP can help by introducing zoning, promoting ecosystem-based management, and improving coordination to ensure sustainable resource use and long-term resilience.

Keywords: *coastal biodiversity, conservation, challenges, MSP, Bangladesh*

Performance, Sustainability, and End-of-Life: A Comparative Study of Conventional Composite Materials and Biodegradable Composites

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Conventional composites, primarily carbon fibre/epoxy and glass fiber/polyester, remain the benchmark for lightweight engineering due to high specific strength, stiffness, and fatigue life. Their adoption in aerospace, wind energy, automotive, and marine structures is driven by performance, not circularity. End-of-life management remains problematic. These materials resist degradation, are difficult to separate, and are predominantly landfilled or incinerated, with mechanical and chemical recycling offering only partial recovery at high energy cost. Biodegradable composites present an alternative design strategy that couples adequate mechanical performance with planned decomposition. By combining natural fibres such as flax, jute, and kenaf with biopolymer matrices like PLA, and PHA, these materials achieve functional properties while enabling composting, soil burial, or anaerobic digestion. Recent advances in fibre treatment, hybridization, and bio-based resins have improved moisture resistance and interfacial adhesion, narrowing the performance gap. This comparative study evaluates both material classes across four criteria: mechanical properties, processing, environmental impact, and end-of-life behaviour. Study was conducted by collecting data from sources like ASTM D6400, EN13432 and Ecoinvent 3.9 Database. According to ASTM standards, conventional systems maintain a three to five times advantage in tensile strength and thermal stability. In contrast, optimized flax/PLA laminates achieve 300–500 MPa tensile strength, sufficient for semi-structural use, with 45 65% lower cradle-to-gate CO2 emissions. I propose a selection framework based on service life, load demand, and disposal infrastructure. Biodegradable composites are most viable for automotive interiors, consumer goods, and biomedical implants. Conventional composites remain essential for long-life, high-load applications. Hybrid systems offer a transitional pathway toward performance-driven sustainability.

Keywords: *Composites, Biodegradable polymers, Natural fibres, Life cycle assessment, End of life management*

From Vulnerability to Agency: Reassessing Climate Politics in the Maldives (2008–2025)

Sayantan Bandyopadhyay
Jawaharlal Nehru University

The Maldives, a small Indian Ocean archipelago, faces acute environmental vulnerabilities rooted in its structural characteristics and limited adaptive capacity. Almost 80 per cent of its territory lies less than one metre above sea level, with 44 per cent of settlements located within 100 metres of the shoreline. Climate impacts are already pronounced, with flood events rising to 91 incidents in 2024 and critical infrastructure concentrated along exposed coastal zones. Fisheries, freshwater sources, and coral ecosystems face mounting threats from ocean warming, salinisation, and bleaching events. This paper examines how the Maldives has navigated climate-induced vulnerabilities through its climate politics between 2008 and 2025. It analyses policy shifts across administrations from Mohamed Nasheed to Mohamed Muizzu, situating them within broader debates on small-state agency and structural dependence in the Global South. The study advances two hypotheses: first, that Small Island Developing States (SIDS) increasingly adopt assertive, rights-based climate diplomacy; and second, that institutional fragility and donor dependence constrain autonomous sovereign climate action. The study employs a qualitative case study approach, drawing on policy documents, government reports, and academic literature to analyse how the Maldivian state navigates vulnerability, diplomacy, and agency. It finds that while the Maldives demonstrates notable diplomatic agency, structural constraints continue to shape the limits of its climate strategy, revealing a tension between assertive global advocacy and constrained domestic implementation.

Keywords: *Maldives, SIDS, Climate Politics, Environmental Vulnerabilities, Adaptation.*

Economic growth and environmental sustainability in South Asia: Insights from panel data

Biswajit Sarangi
MSCB University

This study examines how economic growth influences environmental quality in South Asian countries through the lens of the Environmental Kuznets Curve (EKC) hypothesis. Using annual panel data for all eight South Asian countries from 2000 to 2020, the analysis explores whether economic development initially worsens environmental conditions before eventually leading to improvements. The empirical investigation begins with tests for cross-sectional dependence and slope homogeneity. After confirming the cross-sectional dependence among the countries, the stationarity of the variables is tested using the second-generation CIPS unit root test. Diagnostic results reveal severe heteroskedasticity, serial correlation, and non-normality, making the Driscoll-Kraay Standard Error (DKSE) regression the most appropriate estimation technique. To identify the income level at which the relationship between growth and environmental quality changes, the study employs first- and second-order derivatives. The findings support the existence of an inverted U-shaped EKC for CO_2 emissions, indicating that during the early stages of economic development, rising income levels are accompanied by increased CO_2 emissions and deteriorating air quality. However, once countries attain a certain level of per capita income, further economic growth contributes to a reduction in emissions and an improvement in environmental quality, as higher-income populations tend to place greater value on environmental protection and demand cleaner air and more sustainable development practices. In light of these findings, the study highlights the need for policymakers to pursue economic growth while simultaneously addressing income inequality, as both are vital for improving air quality and reducing the long-term impacts of climate change.

Keywords: *CO2 Emission, DKSE Regression, Economic Growth, Environmental Kuznets Curve, South Asia*

International Airport Siting in Southern Maldives Using Geographic Information System-based Multi-Criteria Decision Analysis

Mohamed Waleedh
Walid Consultancy

The concentration of international air connectivity around Velana International Airport (MLE) predominates the current aviation system in the Maldives, handling the majority of the nation's international air transport. The airports in the Southern Maldives, consisting of Huvadhu Atoll, Fuvahmulah, and Addu City encounter operational constraints and continues to limit direct access to the Sothern Maldives. This study presents a GIS-based Multi-Criteria Decision Analysis (MCDA) to identify and assess potential sites for international airport development in Southern Maldives. Three primary criteria; Environmental (ENV), Spatial (SPA), and Socioeconomic (SOC) were evaluated using the Analytical Hierarchy Process (AHP) and were processed in GIS Weighted Linear Combination (WLC) to develop a 10 m resolution suitability model, with strict no-build constraints. A code 4E runway feasibility assessment retained 14 sites with a composite score of 0.70 or above. The shortlisted sites were ranked using "VIšekriterijumska KOmpromisno Rangiranje" (VIKOR), incorporating an Aviation Traffic Index (AVI). The analysis identified Gan International Airport (GAN) and Kalherehaa Reef near Ayada Maldives Resort as the strongest options. GAN performed strongly due to existing infrastructure and aviation demand, while Kalherehaa showed strong greenfied potential with better spatial suitability and low social conflicts. The findings support a dual approach of upgrading GAN as the current southern gateway while advancing Kalherehaa for detailed feasibility studies. The research presents how remote sensing and AHP-WLC-VIKOR methodology can support transparent, evidence-based infrastructure planning in Small Island Developing States (SIDS), while recognizing strategic limitations of AHP subjectivity and WLC compensability.

Keywords: *Remote Sensing, GIS-MCDA, Airport Siting, AHP-VIKOR, Southern Maldives*

Life Cycle Environmental Impacts of Municipal and Construction Waste Management in Greater Malé, Maldives

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This study applies life cycle assessment to evaluate the environmental implications of transitioning from open dumping and burning to an integrated regional waste management system in the Malé, Maldives. Two scenarios were compared: a 2017 baseline characterised by partial municipal solid waste (MSW) collection; and a planned waste management scenario based on the full operation of the Regional Waste Management Facility at Thilafushi. The functional unit is the management of one tonne of mixed waste and construction waste generated in the Greater Malé area. A gate-to-grave system boundary is applied. Inventory data were derived primarily from feasibility studies, environmental monitoring reports, environmental assessment reports and government sources. The system was modelled in openLCA 2.6.1 using Ecoinvent 3.12 and assessed with the ReCiPe 2016 midpoint Hierarchist method. Monte Carlo uncertainty analysis and sensitivity testing across Individualist, Hierarchist and Egalitarian perspectives were also conducted. Results indicate that the RWMF scenario substantially reduces net environmental impacts relative to the baseline, mainly due to electricity recovery from WtE and avoided production through recycling and material reuse. Flue gas cleaning and fly ash extraction further reduce impacts associated with acidification, particulate matter formation, ecotoxicity and non-carcinogenic human toxicity compared with open burning and dumping. However, carcinogenic human toxicity remains the dominant hotspot, largely due to long-term chromium (VI)-related emissions associated with hazardous waste incineration and residue disposal.

Keywords: *Solid Waste Management, Life cycle analysis, Integrated Waste Management, Hazardous waste, Incineration*

Electric Vehicles as the Future of Sustainable Transportation in the Maldives

Mohamed Haleem
The Maldives National University

The Maldives is one of the world's most environmentally vulnerable nations due to climate change and rising sea levels. At the same time, the country relies heavily on imported fossil fuels for transportation and electricity generation. Electric Vehicles (EVs) have emerged as a sustainable transportation alternative capable of reducing carbon emissions, improving energy security, and supporting renewable energy integration. This research investigates the potential of electric vehicles as the future of transportation in the Maldives. The study examines environmental, economic, and social benefits while identifying challenges related to infrastructure, investment costs, and energy generation. The research utilizes secondary data collected from academic journals, government reports, and international organizations. The findings indicate that EV's offer significant opportunities for reducing greenhouse gas emissions, lowering fuel import expenses, and enhancing sustainable development. However, successful implementation requires strategic investments in charging infrastructure, renewable energy, and public awareness programs. The study concludes that electric vehicles represent a viable and sustainable transportation solution for the Maldives and are likely to play a major role in the country's future transportation system.

Keywords: *Electric Vehicles, Sustainable Transportation, Renewable Energy, Climate Change, Maldives, Green Technology*.

Curtain Call for Single-Use Plastics: A Sustainable Innovation in Clinical Cubicle Curtains

Fathimath Hussain[1], Kun Qi[1], Aqeel khan[1], Doug Anderson[2], George Fern[1]

1. Brunel University of London, 2. EVOXpolymers

The continuous use of conventional polymers contributes to environmental pollution, particularly through the extensive use of plastic in healthcare settings, from small packages to items as big as cubicle curtains. This project investigates the potential of a compostable plastic material, named EVOX polymer, that was processed in our laboratory as a sustainable alternative to the current materials used in cubicle curtains. The properties of commercially available draperies were identified through literature review and our own measurements as a benchmark for the evaluation of the EVOX polymer. Multiple analytical techniques were employed to determine the characteristics of the compostable plastic. The polymer composition was determined using Fourier Transform Infrared Spectroscopy (FTIR). Ultraviolet-Visible spectroscopy evaluated the optical clarity, while water contact angle measurements evaluated surface hydrophobicity. The findings indicated that the tensile strength of the material was similar to that of the commercial cubicle curtains used in the comparison. It demonstrated significant hydrophobicity, perhaps enhancing resistance to moisture and stains, together with sufficient haze value to maintain patient privacy. While biodegradability was not explicitly assessed in this study, the material's composition indicates potential environmental benefits compared to the incumbent polymers in the market being used for this purpose. This study illustrates the viability of employing the EVOX polymer as a substitute for current cubicle curtain materials, exhibiting encouraging functional attributes and sustainability prospects. Future endeavours will concentrate on validating environmental efficacy via biodegradability assessments, alongside evaluating durability, sterilisation, compatibility, and functionality in healthcare environments to facilitate practical implementation.

Keywords: *Cubicle curtains, Compostable plastic, Sustainable healthcare, Environmental impact*

Stormwater Flooding in an Impervious Island City: A Design Strategy Framework for Sustainable Urban Drainage in Male, Maldives

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1. The Maldives National University, 2. Fahi Dhiriulhun Corporation

Male, the capital of the Maldives, covers 204 hectares and is home to over 137,000 residents. The city experiences frequent severe stormwater flooding, with eight major flood events recorded between 2019 and 2024. This research argues that the root cause of flooding in Male is the near-total imperviousness of the urban surface. Buildings cover approximately 80 percent of total land area, and the remaining open surface is sealed with concrete. The stormwater drainage system, established in 1988, was never designed to meet the capacity of current demand. Despite the frequency and severity of stormwater flooding, no systematic research has explored targeted flood mitigation strategies specific to the unique context of Male city, where the few existing regulations also remained unenforced. To address that gap, this study produces an evidence base to inform flood mitigation planning and policy decisions in Malé. This paper adopts a qualitative-dominant mixed-methods approach, drawing on a semi-structured interview with Male City Council, document analysis, water table depth mapping, and field observation. Two distinct causes of drain blockage are identified: domestic waste accumulation and hardened cement debris from construction sites. The 1.28m median groundwater table depth across Male is a constraint that directly shapes the three-phase design strategy framework proposed. Phase 1 targets immediate drainage maintenance through passive filtration devices and construction site controls. Phase 2 transforms open areas of Male into dual-use water retention infrastructure. Phase 3, presented as a long-term recommendation, calls for building-scale rainwater harvesting supported by a regulatory framework drawing on international precedents.

Keywords: *urban stormwater management, impervious surface, sustainable urban drainage, small island cities, flood mitigation*

Island Edge Urbanism: Design Typologies of Waterfront Public Spaces in The Greater Malé Region, Maldives

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The Maldives National University

Waterfront public spaces in Small Island cities fit into a unique position within the urban design field. It is the ecological boundary of the island, as well as, an important part of the public domain, and are often the most explicit expression of cultural identity. Despite their importance, waterfront spaces in Small Island Developing States (SIDS) remain largely absent from the design typology literature, which has predominantly concentrated on post-industrial cities in Europe and Asia. This paper begins to fill this gap by examining the design typologies of public waterfront spaces in The Greater Male' Region, Maldives, and exploring their implications for waterfront design in low-lying island cities. A qualitative comparative case study approach was adopted, with three waterfront public spaces purposively selected from Malé, Hulhumalé, and Vilimalé to represent contrasting urban planning contexts. Each site was analysed through structured field observations using a five-dimensional analytical framework derived from the literature. The analysis suggests three distinct typologies. The Engineered Urban Pocket characterised by engineered hard edge with formal programming but limited spatial quality and cultural expression. The Natural Promenade Edge offering a balanced performance but lacks adequate shade and cultural identity. The Natural Unmediated Edge with minimal design intervention but the best ratings for ecological quality, user diversity, and cultural authenticity. Six overarching themes emerge from the findings, including a persistent lack of shade, weak cultural identity in designed spaces and an inverse relationship between design intervention and nature-based resilience. The study argues for a conceptual shift in island waterfront design that positions ecological integrity, temporal comfort, and cultural identity as co-equal criteria alongside engineering and programming, while proposing a typological framework to inform waterfront planning and comparative research across SIDS.

Keywords: *Public space, Design typology, Island edge urbanism, Waterfront design, Maldives*

A Dual-Phase Strategy for Diesel Removal: Coco Peat Biosorption Followed by Antarctic Microalgal Biodegradation

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Potential sources of diesel fuel contamination in Antarctica include transportation over long distances, localised spills, and the release of accumulated hydrocarbon contaminants resulting from accelerated ice melt. The capacity of native bacteria to degrade hydrocarbons has been explored previously, but Antarctic algal communities have not been extensively researched. In Malaysia, agricultural crops, especially coconut cultivation and harvesting generate a significant amount of waste, while illegal disposal or incineration leads to environmental pollution. Natural organic sorbents derived from agricultural biomass or by-products have excellent reusability in the oil recovery process. In this study, an integrated diesel removal system through biosorption and biodegradation processes was applied at a laboratory scale. Conventional one-factor-at-a-time (OFAT) and statistical Response Surface Methodology (RSM) optimisation examined the performance of diesel sorption by screened coconut husk waste sorbents [coco peat (CP), coco fibre (CF) and coco mix (CM)]. Twelve terrestrial microalgal samples were isolated in this investigation from soil samples collected near the Chilean Bernardo O'Higgins Station. The diesel degradation conditions were optimised through both OFAT and RSM approaches. Optimisation of the CP biosorbent yielded a maximum diesel sorption capacity of 59.17 ± 0.71%. Additionally, cultivating the algal isolate BO-11 under ideal physicochemical conditions resulted in an optimal diesel degradation rate of 78.50 ± 0.13% within a 7-day period. The study highlights the necessity for further exploration of the bioremediation capabilities of Antarctic microalgae, laying the groundwork for developing integrated diesel removal approaches to tackle pollution and protect the ecological balance of the region.

Keywords: *Antarctic microalgae, Coconut husk waste biosorbent, Diesel pollution, Biodegradation, Biosorption*

A Quantitative Assessment of Land Reclamation Projects within the Maldives from 2015 to 2025

Ahmed Shareef

The Maldives is an archipelago of approximately 1192 islands with varying sizes. As approximately 99% of the Maldives consists of the ocean, land reclamation of islands has become a fundamental component in the development of the country. To provide public services and living spaces to a growing population, large-scale reclamation projects have always been conducted throughout the country. Despite the importance of these projects a consolidated record of reclamation activities derived from Environmental Impact Assessment (EIA) reports are lacking. This study aims to quantify, map and analyse the spatial and temporal patterns of land reclamation in the Maldives between 2015 to 2025. The method is a retrospective assessment on publicly available EIA reports for reclamation projects from the year 2015 to 2025. Satellite imagery will be used to verify and quantify reclaimed land area, while Geographic information Systems mapping will be used to provide a visual representation of the reclamation that has been completed through the years. At the time of writing, the quantitative analysis is currently underway. The completed data processing will quantify the the extent, distribution and temporal trends of land reclamation projects across the Maldives. The paper will conclude a comprehensive assessment of the land reclamation activities across the Maldives in the past decade. The resulting study can be used to support future assessments of reclamation such as socio-economic impacts, environmental impacts, policy development or change in demographics of an island.

Keywords: *Environmental Impact Assessment, Land reclamation, Geographical Information Systems, Maldives, Development*

Sustainable retrofitting of existing activated sludge system using additive manufactured media for domestic wastewater treatment

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An attached-growth system in biological wastewater treatment uses microorganisms adhered to fixed media to eliminate organic contaminants, nutrients, and other wastewater constituents. Biological wastewater treatment is the most economical approach available for treating domestic wastewater. The existing activated sludge system can efficiently remove organic contaminants. However, the system is not efficient in removal of nutrients. In this study fixed media was developed using additive manufacturing technology. The additive manufactured fixed media (AFM) used as submerged attached growth media, introduced into the aeration tank of activated sludge systems. The study conducted in a submerged attach growth activated sludge (SAGAS) reactor with conventional activated sludge system (CAS) as control reactor. The treatment of medium strength domestic wastewater was evaluated by varying the flowrate at 5, 10, 15, 20, and 25 L/d. Each reactor was monitored for the removal efficiency of COD, and NH4-N. The removal efficiency of SAGAS was increased by 3% as compared to CAS. Moreover, the nutrient removal efficiency was increased by more than 12% due to growth of ammonia oxidizing bacteria on AFM. The maximum biomass content on AFM of 100.24 mg/carrier was observed on day 20, which remained stable at biofilm maturation stage. Thus, by introducing AFM in existing activated sludge system can enhance the efficiency for nutrient removal. This research contributes to the advancement of sustainable development goal of clean water and sanitation (SDG 6) and industry, innovation and infrastructure (SDG 9).

Keywords: *sludge system, sustainable, wastewater treatment*

National Parking Policy Urban Mobility Parking Governance Smart Parking Technologies Maldives

Ali Jinah
BLC

With a population density exceeding 65,000 residents per square kilometre in Malé, coupled with a sustained annual vehicle registration growth rate of 12% as reported by the Ministry of Transport and Civil Aviation (2023), the sheer pressure on limited urban space is immense. The demand for parking not only exceeds the available allocation but does so within an administrative environment characterized by profound fragmentation. The Current fragmented parking regulations have not adequately laid the groundwork for efficient people mobility and for the development of sustainably dense urban structures. This qualitative study highlights the necessity of a harmonized national parking policy in the Maldives, deconstructing the legal, economic, and technological problems that structure parking in the country. Through a semi-structured [a1.1]9 (Nine) interviews with senior officers from government ministries, local councils, the Private Sector, Public-Private Partnership (PPP) stakeholders, and regulatory bodies. It explores legal, institutional, and capacity shortcomings in enforcement and policy coherence. The study also examines the negative impact of poor parking administration on economic efficiency, an investor-friendly climate, and service delivery. Furthermore, it references new digital technologies, such as digital payment systems, smart parking platforms, and GIS data providers, to better manage parking and improve the user experience. The results point to the need for national regulation harmonization, clear institutional roles and duties, and a technology- enabled system that supports sustainable development and recommend that the Maldives establish an overarching national parking policy aimed at improving urban mobility, providing regulatory certainty, and facilitating long-term economic and infrastructure development throughout the country.

Keywords: *Maldives, National Parking Policy, Legal fragmentation, Economic barriers, Smart parking technologies, Small Island Developing States (SIDS)*

Pressure Retarded Osmosis: An Emerging Pathway to Energy Recovery in Desalination

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Desalination is an energy-intensive process that produces concentrated brine while only partially recovering freshwater from the seawater feed. Island nations such as the Maldives rely heavily on desalination to meet the growing demand for freshwater, increasing the importance of cost effectiveness and operationally efficient water recovery technologies. Pressure Retarded Osmosis (PRO) harnesses energy from the mixing of waters of differing salinities, providing an alternative approach to potentially improve the energy efficiency of current desalination processes. This study proposes and evaluates a potential design for the integration of PRO to improve energy efficiency and water recovery from desalination. The proposed design implements a secondary loop that redirects desalination concentrate to the PRO module, which harnesses the energy generated through mixing with the incoming seawater feed. The mixed stream is then recirculated to the desalination feed, recycling water to improve water recovery. Preliminary simulation results show modest improvements in energy efficiency and water recovery. Further work involves the development and testing of a physical prototype to investigate performance in both lab-simulated and real-world conditions. Successful implementation of the technology can potentially result in reduced energy consumption and operational cost in freshwater generation in the Maldives.

Keywords: *Salinity Gradient Energy, Renewable Energy, Desalination Pressure Retarded Osmosis, Energy Recovery*

Water Security in the Maldives: Effecting Perceptible Change

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Maldives faces multifaceted environmental challenges that include a plethora of major traditional and non-traditional threats. For example, as an island nation with 99% oceanic territory, it is deemed to be a 'big ocean state'. However, despite being surrounded by 'water' on all sides, Maldives faces acute water shortage internally. This inherent dichotomy proves the English poetic adage, "Water! Water everywhere! Not a drop to drink!" true and reflects a crude reality that governs Maldives' everyday existence. The island nation with 26 atolls comprising 1192 islands is composed of sandbars and coral reefs. This combination creates for shallow aquifers which groundwater and freshwater substantially scare. Compounded by the problem of unpredictable rainfall and sea level rise, the issue of water scarcity is becoming severe in the island nation every passing year. This water scarcity is creating a dual effect: firstly, it is adversely affecting the health and wellbeing of the Maldivian citizenry. Secondly, it is also likely to affect the tourism industry of the island nation which is the backbone of the Maldivian economy. Considering these facts, the article suggests that Maldives should prioritise water security as a key component of its national security policy. The article also suggests that the island nation should view water security not as a subset of the problem of climate change, but as an independent entity since water (in)security acts as a 'force multiplier' in threatening the island nation's national security. In this regard, the article also asserts that the deliberate use of harming critical civilian infrastructure in potential conflict may lead to the weaponization of water which may have a disruptive impact. This adds a realist assessment to the question of water security within Maldives. Therefore, this paper proposes that the solution of the problem lies in securitizing the discourse on water security in the Maldives, such that it will enable Malé to focus independently on the water crisis and treat it as a tangible policy issue, enabling it to find diplomatic and policy-relevant solutions to the problem. The solutions will lie both at the level of the state and the level of the community.

Keywords: *water security, perceptible change, Maldives*

Glider-Based Observations of Temperature, Salinity, and Chlorophyll Variability Near the Maldives

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Since June 2024, autonomous underwater gliders deployed through a partnership between the The Maldives National University and the University of Washington have been collecting high-resolution oceanographic observations near the Maldives. Located at the junction of key water exchanges in the northern Indian Ocean, the Maldives are strongly influenced by monsoon-driven circulation that governs regional heat and freshwater transport. The Arabian Sea experiences an annual salt surplus due to net evaporation and
the inflow of high-salinity waters from the Red Sea and Persian Gulf, while the Bay of Bengal receives a freshwater surplus from river discharge and excess precipitation. Seasonal exchange between these basins helps regulate the salinity structure of the northern Indian Ocean, while the accumulation of fresher surface waters near the Maldives influences mixed-layer depth, sea-surface temperature, and air–sea fluxes. The gliders collect dense profiles of temperature, salinity, and chlorophyll in the upper 1000m across all seasons and weather conditions. As the partnership approaches its third year, we assess variability in upper-ocean properties from kilometre and daily scales to seasonal and interannual timescales.

Keywords: *air–sea fluxes, salinity stratification, monsoon circulation, thermohaline variability, upper-ocean hydrography*

Preliminary Assessment of Depth-Related Variation in Coral Fragment Health and Reef Fish Assemblages across Reef Restoration Zones

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This study presents a preliminary assessment of coral condition, fragment health, and associated reef fauna across shallow and deep monitoring zones at W Maldives. Frame-level observations included depth, frame condition, sediment accumulation, biofouling, and mortality, while fragment-level data recorded genus, size, live tissue cover, health status, disease, predation, bleaching or stress, and missing fragments. The results indicate that most frames remained in good structural condition, with generally low mortality across both depth zones. However, shallow frames showed relatively higher sediment presence and more minor structural issues than deep frames, and evidence of Drupella predation was also recorded on some shallow-water frames. At the fragment level, most colonies retained high live tissue cover, particularly among Acropora and Pocillopora, although partial mortality and stress were observed in a subset of fragments. Disease was negligible overall, while predation was limited but locally evident in the shallow zone. Fish community data further suggest depth-related ecological differences, with substantially greater total abundance recorded in the deep zone than in the shallow zone. The deep assemblage was dominated by basslets, damselfish, surgeonfish, wrasses, butterflyfish, and parrotfish, whereas the shallow zone supported lower overall abundance but retained several shared reef-associated groups. Overall, these findings suggest that deeper restoration frames may currently provide more favourable conditions for coral maintenance and reef-associated biodiversity, while shallow frames may be more exposed to sediment-related stress and localized predation pressure. Continued monitoring is needed to determine whether these depth-related patterns persist through time and to guide restoration site management.

Keywords: *Coral reef restoration, coral fragment health, depth-related reef variation, Drupella predation, reef fish assemblages*

Spatial Analysis of Long-Term Wave Climate Around the Maldives Using ERA5 Data, Wave Roses and Nakaiy Seasons

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This study characterises the long-term spatial wave climate around the Maldives using ERA5 wave data, wave roses, monsoon seasons and traditional Nakaiy periods. Hourly ERA5 wave data from 10 offshore locations representing the far north, north-central, central, south-central and far south of the Maldives were analysed to examine significant wave height, mean wave period, wave direction, seasonal variability and directional wave exposure. The dataset covered the period from 1940 to 2025, with 1940–2025 treated as 86 complete years. Records were classified into two broad monsoon periods, with Iruvai defined approximately from 10 December to 7 April and Hulhangu from 8 April to 9 December. Each hourly record was also assigned to a traditional Nakaiy period using its month-day value. The results show clear spatial and seasonal variation in wave climate across the Maldives. Hulhangu had higher mean significant wave height than Iruvai, increasing from 1.011808m to 1.349956m. Wave roses indicate that offshore wave exposure differs between northern, central and southern locations, with dominant wave directions varying between regions and seasons. The Hulhangu period generally shows stronger wave activity predominantly from South and Iruvai shows wave activity from East reflecting the influence of the southwest monsoon on wave conditions around the archipelago. At the Nakaiy scale, Adha had the highest mean significant wave height (Hs = 1.617958m), while Fas-badhuruva had the lowest (Hs = 0.925983m) and Miahelli had the highest 95th percentile significant wave height of 2.326206m, suggesting rougher conditions. The Nakaiy-based analysis provides a useful traditional seasonal framework for interpreting changes in significant wave height, wave period and wave direction, although ERA5 should be treated as a scientific reanalysis dataset rather than as a direct validation of the Nakaiy calendar. Overall, the analysis demonstrates that combining ERA5 data, wave roses and Nakaiy periods can provide a useful basis for understanding long-term waveclimate variability around the Maldives and for supporting coastal hazard, fieldwork and adaptation-related studies.

Keywords: *Maldives, Nakaiy Calendar, ERA5 Hulhangu Monsoon, Iruvai Monsoon*

Rainfall Trend and Intensity–Duration–Frequency (IDF) Analysis for Malé, Maldives

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Small Island Developing States (SIDS) face growing flood risks from short duration, high intensity rainfall, yet many lack the detailed rainfall analyses needed for resilient stormwater planning. This study provides the first integrated assessment of rainfall trends, extreme rainfall behaviour, and Intensity–Duration–Frequency (IDF) relationships for Malé, Maldives, using 31 years of hourly rainfall data (1993–2024). Trend detection was conducted using the Mann–Kendall test and Theil–Sen slope estimator, while extreme rainfall characteristics were analysed using the Gumbel Extreme Value Type I distribution. IDF curves were developed through power law fitting across multiple durations and return periods. Results show strong interannual variability in annual rainfall totals, ranging from about 1300 mm to 2700 mm, but no statistically significant long term trend in annual rainfall or 24 hour annual maxima. However, several wet season months display increasing rainfall tendencies, suggesting a shift in rainfall distribution within the year rather than an overall increase in total rainfall. This intra annual concentration elevates the likelihood of short duration drainage exceedance in Malé's densely built low lying environment. Extreme value analysis produced a 100 year, 24 hour design rainfall depth of 216.9 mm, consistent with tropical coastal climates, while IDF curves show steep increases in intensity for short durations, with rare, high return period events reaching up to 3.94 mm/min. Overall, the findings indicate that flood risk in Malé is driven more by rainfall intensity and temporal clustering than by long term changes in annual rainfall volume. The updated IDF curves and trend insights provide essential inputs for stormwater design, flood mitigation, and climate resilient urban planning, forming a robust baseline for future non-stationary analyses and hydrodynamic modelling in the Maldives**.**

Keywords: *Malé, Maldives, Flood Risk, Extreme Value Analysis, IDF Curves, Rainfall Intensity*

Coral-Stone Funerary Structures in the Maldives: Reconstructing a Recurrent Mortuary Tradition through Photographic Rescue Archaeology

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Coral-stone funerary structures locally known as gaa sandhoah ("stone coffins") have been documented from several islands of the Maldives, including Malé, Fuvahmulah, and Hithadhoo (Addu Atoll). Most examples, however, have been destroyed, dismantled, or inadequately recorded, leaving only fragmentary archaeological evidence. This study demonstrates that independent archival photographs, excavation records, historical documentation, and accidental discovery images can be integrated to reconstruct the morphology and distribution of this distinctive Islamic funerary architecture despite the loss of its original archaeological context. This study proposes photographic rescue archaeology as a systematic framework for archaeological reconstruction in situations where archival photography constitutes the principal surviving evidence. Rather than relying solely on intact stratigraphic sequences, the study evaluates recurring architectural characteristics through convergent morphological evidence derived from multiple independent sources. Beyond the Maldives, similar circumstances occur in low-lying island environments, rapidly urbanising historic centres, conflict-damaged archaeological landscapes, and early twentieth-century excavations documented primarily through photographic archives. In such settings, photographic rescue archaeology offers a structured means of integrating legacy visual records into archaeological interpretation while maintaining explicit distinctions between observation and reconstruction. Comparative analysis identifies a consistent suite of diagnostic features across four geographically separated sites, including rectilinear slab-built burial chambers, standardized coral-stone construction, and repeated associations with Islamic-period mortuary landscapes. Recurring characteristics observed across the four sites support the interpretation that gaa sandhoah represents a distinctive Islamic funerary architectural tradition rather than isolated local anomalies. Beyond documenting an overlooked aspect of Maldivian archaeology, the study demonstrates that rigorous archaeological reconstruction remains possible where physical evidence has largely disappeared.

Keywords: *Photographic rescue archaeology, Gaa sandhoah, Maldives archaeology, Coral-stone burial structures, Mortuary landscapes*

From Risk to Resilience: Centring Equity in Climate-Health Action Across South and Southeast Asia

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1. ***Monash University, 2. Western Sydney University, 3. The Maldives National University, 4. Sunway University, 5. Heidelberg University***

South and Southeast Asia are global climate-health hotspots, facing disproportionate risks from extreme weather, increasing temperature, and declining air quality. Despite this high vulnerability, empirical evidence remains limited on how regional actors prioritise these risks and manage the resulting health inequities. We used sequential mixed methods design. Phase one included a cross-sectional survey with experienced climate change and health stakeholders (N=71). The stakeholders were asked to rank climate exposures, health impacts, vulnerable populations, and feasible solutions. Phase two involved thematic analysis of semi-structured interviews (n=16) to explore equity considerations and strategies for addressing the impact of climate change on health. Ethical approval was acquired from Monash University Human Research Ethics Committee (MUHREC) (Project ID: 46823). Stakeholders prioritised extreme weather as the leading exposure (33.6%), physical health as the most pressing impact (23.7%), and infants and children as the most vulnerable group (25.6%). Stakeholders' recommended interventions are on resilient health systems (29.8%), community disaster preparedness (29.6%), and improving climate literacy (24.6%). Qualitative findings highlighted the need for systems-level transformation through: (1) cultivating awareness via tailored, culturally aligned communications and capacity building; (2) co-producing multi-level, interdisciplinary climate action; (3) integrating climate education into mainstream curricula; and (4) advocating for the meaningful inclusion of marginalised communities. Findings highlighted three priorities: 1) protecting infants and children; 2) strengthening resilient health systems and community preparedness for climate emergencies; and 3) developing a climate-smart healthcare workforce. Future research should prioritise the co-design and evaluation of equity-centred interventions that deliver multi-sectoral benefits.

Keywords: *Equity, Climate change, Health, Southeast Asia, South Asia*

Current landscape of climate change and health research among vulnerable population in South and Southeast Asia: A scoping review

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Since the 2015 Paris Agreement, South and Southeast Asian countries have articulated climate commitments, yet activities related to mitigation, adaptation, building resilience, health preparedness, and equity remain unevenly distributed across the region. Despite low per-capita emissions, the region faces high climate vulnerability and disproportionate health risks. We conducted a scoping review aiming to examine recent findings (2014-2024) on the impact of climate change and to map and review interventions designed to reduce climate-related health risks among vulnerable groups. We followed PRISMA guidelines, searching eight databases from March 2025, for studies on climate change, health, and vulnerable populations in South and Southeast Asia. Data were extracted using the Centre for Disease Control (CDC) framework and coded by climatic events, population groups, and health outcomes to synthesise impacts and interventions. From 149,420 studies, 76 met inclusion criteria, predominantly observational (cross-sectional or cohort studies) and only two interventional studies were conducted. Evidence highlights disproportionate climate impacts on vulnerable populations: (a) air pollution and extreme heat affect the respiratory, cardiovascular, developmental, and mental health of most vulnerable groups; (b) rainfall anomalies, typhoons, and deforestation impact mainly women and children; and (c) few interventional studies address mitigation or adaptation strategies. This review highlights uneven research on climate change and health in South and Southeast Asia, with vulnerable populations disproportionately affected. Evidence gaps remain in healthcare workforce development, disaster preparedness, mental health, and climate change interventions. Advancing climate-health equity requires context-sensitive, community-based strategies, intervention research, and collaborative approaches that integrate social justice and resilience-building.

Keywords: *Climate change, Health, Vulnerable populations, Southeast Asia, South Asia*

Water Security in the Maldives: Effecting Perceptible Change

Anuttama Banerji
Centre for Aerospace Power and Strategic Studies

The article suggests that Maldives should prioritise water security as a key component of its national security policy. The article also suggests that the island nation should view water security not as a subset of the problem of climate change, but as an independent entity since water (in)security acts as a 'force multiplier' in threatening the island nation's national security. In this regard, the article also asserts that the deliberate use of harming critical civilian infrastructure in potential conflict may lead to the weaponization of water which may have a disruptive impact. This adds a realist assessment to the question of water security within Maldives. Therefore, this paper proposes that the solution of the problem lies in securitizing the discourse on water security in the Maldives, such that it will enable Malé to focus independently on the water crisis and treat it as a tangible policy issue, enabling it to find diplomatic and policy-relevant solutions to the problem. The solutions will lie both at the level of the state and the level of the community.

Keywords: *water security, climate change, Maldives*

Sub-theme 2: Innovation, Technology, and Digital Transformation

9 Abstracts



Innovative Technology and Pedagogy for Driving Best Practice and Sustainable STEM Development in Nigeria

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This study examines the transformative potential of innovative technologies and pedagogical practices in advancing sustainable STEM education within Nigeria's complex educational landscape. Despite persistent disparities in access and quality, the nation's cultural diversity, growing stakeholder awareness, and youthful demographic present significant opportunities for reform. Drawing on collected and analysed data within a SWOT analysis framework, the paper highlights systemic strengths such as cultural richness, community engagement, and emerging digital platforms, while acknowledging weaknesses including inadequate infrastructure, limited resources, outdated teaching methods, and high dropout rates. Opportunities are evident in the integration of information and communication technology, e learning, mobile learning, and multimedia tools, which can expand access, foster critical thinking, and enhance instructional quality. However, threats posed by economic instability, political inconsistency, technological inequities, and entrenched social disparities remain formidable. The findings underscore the necessity of a holistic approach that prioritises infrastructure investment, continuous professional development for educators, and robust public–private partnerships. Furthermore, the adoption of innovative pedagogical strategies such as inquiry based, collaborative, and problem-based learning, combined with digital technologies, can cultivate inclusive, resilient, and future ready educational systems. The study concludes that sustainable STEM development in Nigeria requires coordinated action among government, educators, communities, and private stakeholders to ensure equitable access, improved learning outcomes, and the empowerment of youth to contribute meaningfully to national development in a rapidly evolving global economy.

Keywords: *Innovative Technology, Pedagogy, STEM Development, Inclusive Education, ICT and E-Learning*

The Future of Healthcare Work: Leveraging Telehealth Technologies for Enhanced Work-Life Balance

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Cl Healthcare systems globally are undergoing a paradigm shift, with telehealth technologies redefining the future of professional work in clinical settings. This study examines how telehealth technologies can be strategically leveraged to enhance work-life balance among healthcare professionals, while simultaneously informing future-ready workforce models and digital health transformation in the sector. A qualitative research design was employed, using semi-structured interviews as the primary data collection method. A convenience sample of 20 physicians from diverse medical specializations and workplace settings—including hospitals and private clinics in Saudi Arabia—participated in the study. Interviews were conducted remotely, with each session limited to 30 minutes. Ethical standards were upheld through voluntary participation and full confidentiality of participants' identities. Data were analysed using thematic analysis following Braun and Clarke's (2006) framework. Findings reveal three overarching themes: the positive role of telehealth in enhancing work efficiency, schedule flexibility, and patient reach; integration challenges including blurred work-personal boundaries, extended working hours, diagnostic limitations, connectivity issues, and variable patient digital literacy; and strategic coping practices such as structured scheduling, workflow automation, and remote communication optimization. Critically, the study demonstrates that healthcare professionals' work-life balance is a direct determinant of patient safety and care quality, linking human resource well-being to broader healthcare system performance. These findings offer actionable recommendations for institutions, policymakers, and healthcare leaders seeking to build sustainable, digitally driven workforce models for the future of healthcare work.

Keywords: *Telehealth Technologies, Work-Life Balance, Future of Work, Digital Health Transformation, Healthcare Workforce.*

Automation and Local Labour Market: A Framework for Assessing the Role of Industrial Robots in Indian Manufacturing

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Despite advances in robotics potentially causing job losses, evidence on their effect on India's labour market remains limited. This study examines the effect of industrial robots on local labour market, defined at state-sector level, focussing on the employment and wages in India's organized manufacturing sector. The measure of robot exposure is computed at state-sector level using Bartik-style approach following Acemoglu and Restrepo (2020). We use International Federation of Robotics (IFR) data on the growth in robot adoption across 13 manufacturing industries (as per IFR) between 2006-2021, combined with their state-sector baseline employment shares from 1998, prior to the onset of advances in robotics. The data on employment and wages is drawn from Indian Annual Survey of Industries. We aim to isolate the changes in robot penetration driven by exogenous technological progress. Therefore, we leverage robot adoption trends from Asian countries more advanced than India in robot adoption, where India is gradually catching up. The study applies a two-stage-least-square approach, using robot adoption in Indonesia and Philippines, as an instrument for robot adoption in Indian industries. We found wide variation in robot exposure across state-sector and is primarily driven by automotive industry. Findings suggest that a 0.1 increase in exposure to robots reduces employment by 8.5%, while the estimated 9.5% decline in wages is statistically insignificant. Our results are robust to alternative specifications. Policy implications for India highlight reskilling and training to support worker reallocation amid employment losses, while insignificant wage effects suggest labour supply adjustments may be cushioning wage impacts.

Keywords: *Automation, Indian manufacturing, Robot Exposure, Industrial robots, Labour market*

Artificial Intelligence–Driven Minimal Residual Disease Profiling for Precision Risk Stratification and Personalized Prognostication in Adult B-Lineage Acute Lymphoblastic Leukaemia

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All India Institute of Medical Sciences

Adult B-lineage acute lymphoblastic leukaemia (B-ALL) is a biologically heterogeneous haematological malignancy that requires accurate risk stratification to optimize therapeutic decision-making and improve clinical outcomes. Minimal residual disease (MRD), assessed by multiparametric flow cytometry, is a well-established prognostic biomarker in B-ALL. However, conventional MRD interpretation based on fixed thresholds may not fully capture the complex immunophenotypic patterns associated with treatment response, disease persistence, and relapse. This study investigated the application of artificial intelligence (AI), including machine learning (ML) and deep learning (DL) approaches, to enhance MRD-driven prognostic assessment in adult B-ALL. High-dimensional 6-color flow cytometry data generated from day-29 post-induction bone marrow samples of adult B-ALL patients treated under standardized chemotherapy protocols were analysed. Following data preprocessing, quality control, and feature extraction, MRD-associated immunophenotypic variables were integrated with relevant clinical and laboratory parameters. Multiple AI-based predictive models, including ensemble learning, gradient-boosting algorithms, and deep neural networks, were developed to predict remission status, relapse risk, and overall survival. Model training and optimization were performed using rigorous cross-validation strategies to ensure robustness and minimize overfitting. Feature-importance and model-interpretability analyses were conducted to identify key immunophenotypic signatures associated with clinical outcomes. Model performance was evaluated using accuracy, sensitivity, specificity, area under the receiver operating characteristic curve (AUROC), and survival-based metrics. The integration of AI-driven analytics with flow-cytometric MRD assessment provided a scalable, reproducible, and clinically translatable framework for precision risk stratification, personalized prognostication, and individualized treatment planning in adult B-ALL.

Keywords: *Acute Lymphoblastic Leukaemia, Minimal Residual Disease, Artificial Intelligence, Deep Learning, Personalized Medicine*

Transforming Natural Product Drug Discovery Through AI: From Multi-Omics Data Mining to Generative Molecular Design

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Natural products have invaluable score of therapeutic effects for centuries. They significantly contribute to modern drug discovery. The identification and optimization of active constituents derived from natural resources remains time consuming and resource intensive. The growing demand for rapid therapeutic development encouraged the incorporation of AI and computational methods. Recent advances in artificial intelligence, machine learning, multi-omics technologies, molecular docking and generative deep learning models have transformed the natural product research. In this review, the integration of AI – driven methodologies with natural product drug discovery, highlighing the roles of genomics, transcriptomics, proteomics, metabolomics and computational approaches increasing the speed of lead identification and optimization. Emerging AI framework like NIMO and NGPT are new technologies for designing novel bioactive compounds. The review also examines molecular docking and virtual screening as vital tool for target identification and lead prioritization. Challenges and future perspectives regarding data quality, interpretation, and translational approach are also analysed. The multi-omics create high – quality biological data that is a foundation for AI driven drug discovery. The development of natural product science with AI and multi-omics technologies represents a paradigm shift towards more innovative drug discovery pipeline.

Keywords: *Natural products, Artificial Intelligence, Drug discovery, Multi-omics, Molecular docking*

A Comparative Study of C, C++, Java, Haskell, and Python as Introductory Programming Languages in Computer Science Education

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Selecting an appropriate introductory programming language is a critical decision that influences students' computational thinking, programming proficiency, and long-term success in computer science education. Languages such as C, C++, Java, Haskell, and Python each offer distinct pedagogical advantages while presenting different levels of syntactic complexity, abstraction, and learning difficulty. This paper presents a Systematic Literature Review (SLR) that synthesizes empirical evidence on the effectiveness of these five programming languages in introductory programming education. Following a structured review methodology, relevant studies were identified through major academic databases using predefined search strategies, inclusion and exclusion criteria, and quality assessment procedures. The selected studies were analysed with respect to readability, syntax complexity, cognitive load, debugging support, programming paradigms, student performance, learner engagement, industrial relevance, and educator recommendations. The review indicates that Python consistently achieves the most favourable educational outcomes among the languages examined. Most empirical studies report improved student engagement, fewer syntax-related errors, enhanced programming confidence, and higher course completion rates when Python is used as the introductory language. While C and C++ provide a strong foundation in systems programming, Java reinforces object-oriented concepts, and Haskell develops functional programming skills, these languages generally impose a higher cognitive burden on beginners. The findings suggest that Python offers the best balance between simplicity, expressiveness, pedagogical effectiveness, and industry relevance, making it the most appropriate general-purpose introductory programming language for novice learners. This review provides evidence-based recommendations that may assist educators and curriculum designers in selecting programming languages for introductory computer science courses.

Keywords: *Introductory Programming Language*, *Computer Science Education*, *Computational Thinking*, *Literature Review*, *Programming Education*

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Rider-Aware Smart E-Bikes Using Wearable Physiological Sensing and Embedded AI for Adaptive Micro-Mobility

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Smart e-bikes can support sustainable and inclusive mobility, yet most connected systems remain vehicle-centred and do not respond to the rider's physiological state during a ride. This study aimed to design and preliminarily evaluate a rider-aware smart e-bike framework that synchronizes wearable physiological sensing, bike telemetry, mobile coordination, and embedded artificial intelligence for conservative adaptive assistance. The prototype architecture links a Wear OS watch, Android gateway, and ESP32 bridge to align heart-related signals, motion, speed, cadence, braking, route context, and signal-quality indicators. A lightweight three-class inference pipeline estimates nominal, elevated, and overload-like rider states, while a confidence-aware policy suppresses uncertain outputs and limits actions to rider-facing alerts or logged support targets. The study used software-in-the-loop bench evaluation with synthetic multimodal ride data; no human-subject experiment was conducted, and future rider testing will require ethical approval and informed consent. The simulator generated eight training rides and two held-out test rides, producing 4,288 training windows using 10 s windows and a 2 s update stride. Preliminary results showed 86.0% accuracy, 0.764 macro-F1, 0.064 Brier score, 0.984 mean quality score, 2.43% wearable packet loss, and 6.36 s mean event-response latency. These findings indicate that wearable sensing and embedded AI can support stable, uncertainty-aware rider-state feedback before field deployment. The framework offers a safety-conscious pathway for adaptive micro-mobility and motivates controlled pilot studies with participant-specific calibration and rider-acceptance assessment.

Keywords: *smart e-bike, wearable physiological sensing, embedded AI adaptive assistance, micro-mobility*

Sub-theme 3: Science, Health, and Human Well-Being

55 Abstracts



Antibiotic resistance in oral bacterial species associated with dental caries and periodontitis - A systematic review

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This review aimed to assess resistance patterns of oral microbial species associated with dental caries or periodontitis to frequently used antibiotics in dental settings. Searches were conducted across various databases such as PubMed, Scopus, Embase, Cochrane and Google Scholar. All studies that reported resistance percentages of oral microbial species to various antibiotics among patients with dental caries or periodontitis and provided the total number of isolates and sample size, were included in the review. The resistance percentages of various oral microbial species to 36 different antibiotics have been reviewed. Meta-analysis was conducted only for Streptococcus mutans and Staphylococcus aureus due to the lack of availability of studies for other oral microbial species. Antimicrobial resistance estimates were pooled using a random-effects model in RStudio software (Version 4.3.1). The review was conducted according to PRISMA guidelines with the protocol registered in PROSPERO (CRD42024597636). A total of 12 articles met the inclusion criteria. Among Streptococcus mutans, the antibiotic resistance was highest for penicillin at 0.28 (CI: 0.21-0.37, p = 0.0002) and lowest for azithromycin at 0.04 (CI: 0.1- 0.14; p = 0.0333). For Staphylococcus aureus, resistance was highest for ampicillin at 0.25 (CI: 0.16-0.38, p = 0.0025) while resistance to vancomycin and ciprofloxacin was lowest at 0.04 (CI: 0.02- 0.10, p = 0.1069). The findings highlight considerable resistance in oral microbial species especially among Streptococcus mutans and Staphylococcus aureus to commonly prescribed antibiotics among patients with dental caries or periodontitis emphasizing the need for rationale-based prescribing and antimicrobial stewardship programs in dentistry.

Keywords: *antibiotic resistance, oral bacteria, oral diseases, s. mutans*

Occlusal Interventions for Managing Temporomandibular Disorder

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To assess the effects of occusal interventions in people diagnosed with temporomandibular disorders (TMD), compared to other interventions or no treatment, on joint pain, muscle pain at rest and when chewing, quality of life, discomfort, and recurrence. Cochrane oral health's information specialist searched following sources up to 9 August 20222: Cochrane Oral Health's Trials Register, Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE via Ovid, Embase via Ovid, and two trials registers. We included randomized controlled trials (RCTs) of occlusal interventions (splints or adjustment) for managing TMD compared with no treatment, placebo. We followed Cochrane methodology for the data extraction, statistical analysis. We included 57 studies that compared occlusal splints with no treatment, placebo, or another treatment. Most of the studies evaluated full hard stabilisation splint (FHSS) as the occlusal splint. We judged only one study to be at low risk of bias. The key results presented were measured between 4.4 weeks and 4 months. It is important to note that we have very low certaintly oin the evidence for all comparisons and outcome assessed. There may be little to no difference in self-reported joint pain when chewing between occlusal splint (FHSS) and placebo (non-occlusal splint) (RR 1.88, 95% CI 0.94 to 3.75; 1 study, mixed TMD). Occlusal splints of the FHSS type may reduce muscle pain when chewing compared to no treatment, but the evidence in very uncertain. Orofacial myofunctional therapy may reduce severity of joint noise compared to occlusal splint (FHSS).

Keywords: *Randomized controlled trial, TMD, Occlusion, Occlusal splint Occlusal splint*

Utility of Inflammatory Biomarkers in Predicting Severity of Community-Acquired Pneumonia

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Accurate early differentiation of pneumonia aetiology and identification of patients at risk of severe disease are clinically important for guiding management and improving outcomes. This study aimed to evaluate the distribution of inflammatory biomarkers across aetiologies and their utility in predicting severity in community-acquired pneumonia (CAP). In this prospective observational study, 114 adult CAP patients from a single center were included. Biomarkers analysed included C-reactive protein (CRP), ferritin, lactate dehydrogenase (LDH), total leukocyte count (TLC), platelets, and haemoglobin. Severe disease was defined by ICU admission, vasopressor requirement, or oxygen support. Statistical analysis included Kruskal–Wallis test, multivariable logistic regression, and receiver operating characteristic (ROC) analysis. Median CRP differed significantly across aetiologies ($p=0.00026$), with higher values in fungal (297 mg/L) and bacterial (143 mg/L) compared to viral infections (29 mg/L). LDH showed borderline significance, while ferritin, TLC, platelets, and haemoglobin were not significantly different. Severity and mortality varied across groups, highest in bacterial cases (22.0%). Increasing age ($OR\approx1.03$, $p=0.026$) and higher CRP ($p\approx0.0505$) independently predicted severe disease. However, CRP alone showed modest predictive ability (AUC 0.61). These findings suggest CRP is useful for etiological differentiation and severity assessment when integrated with clinical and radiological parameters. Larger studies are needed to validate biomarker-based risk stratification in CAP

Keywords: *Community-Acquired Pneumonia, C-Reactive Protein, Inflammatory biomarkers, Severity Prediction, Etiological Differentiation*

Is the Maldivian Food Metabolism resilient to external shocks? Evidence from long-term Material Flow Analysis

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Small Island Developing States (SIDS) are structurally dependent on food imports and highly vulnerable to climate, market, and geopolitical disruptions. Geographic dispersion and isolation further constrain domestic food production. Food and nutrition security (FNS), therefore, remains a critical challenge for island nations. This study conducts the first food-focused material flow analysis for an island nation in the Indian Ocean, the Maldives, tracing food-related biomass flows from 1976 to 2023, complimented with a NOVA-based assessment of ultra-processed foods (UPFs) for 2015–2023. Results reveal a substantial increase in food imports from 0.018 Mt in 1976 to 0.349 Mt in 2023 (+1,840%), while consumption grew fivefold. At the same time, crop harvest declined by roughly 77%. Although fresh foods dominate import volumes, UPFs have increased, accounting for approximately 26–33% of daily dietary energy intake. Import composition also shifted, with declines in ready meals and increases in products such as sauces and confectionery, likely responding to declining affordability and public health messaging. These trends indicate that the Maldivian food system has evolved toward strong external dependence and changing dietary composition. The current system heightens exposure to external shocks, accelerates climate impacts on agriculture, and exacerbates non-communicable disease burdens and associated economic costs. Strengthening resilience will depend on strategies combining protection of fisheries, support for local farmers, and improved cold-chain infrastructure. These findings illustrate how import-dependent food systems shape diet quality and long-term socioeconomic vulnerability. We argue that systemic approaches considering local contexts are urgently needed to enhance food security in island nations.

Keyword: *Socio-metabolic, risk Food Security, Non- communicable diseases, Biomass Flow Analysis, Island Industrial Ecology*

Exploration of Bio Surfactant-Producing Fungi from Diesel-Contaminated Soil in Thuraiyur Region: Tamilnadu, India.

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Biosurfactants are eco-friendly surface-active biomolecules produced by microorganisms that reduce surface and interfacial tension and have significant applications in environmental remediation and industrial processes. The increasing contamination of ecosystems by petroleum hydrocarbons necessitates the identification of efficient and sustainable biosurfactant-producing microorganisms, particularly from polluted environments. The present study aimed to isolate, screen, and characterize potent biosurfactant-producing fungal species from oil-contaminated soils. Soil samples contaminated with diesel, crude oil, and engine oil were collected from a lorry service station in Thuraiyur, Tiruchirappalli, Tamil Nadu, India. Fungal isolates were obtained using Mineral Salt Medium and screened for biosurfactant production using oil displacement, drop collapse, emulsification index and haemolysis assays. Promising isolates were subjected to molecular identification using sequencing techniques. Extracted biosurfactant was characterized by GC–MS analysis. A potent strain was identified as Trichoderma viride. It showed high emulsification activity and effective surface tension reduction. GC–MS revealed lipopeptides and phenolic compounds. This study successfully identified Trichoderma viride as a promising biosurfactant producer. These findings indicate its potential application in bioremediation of hydrocarbon-contaminated environments and as an eco-friendly alternative to synthetic surfactants. This work supports sustainable strategies for environmental management and industrial applications. Furthermore, quantitative emulsification index values and positive assay responses confirmed its biosurfactant production efficiency. The methodological approach ensured reliable screening and accurate taxonomic identification of the isolate. Overall, the results clearly address the study objectives and demonstrate the feasibility of utilizing fungal biosurfactants for sustainable environmental remediation practices in polluted sites worldwide with improved efficiency and reduced environmental impact overall globally

Keyword: *Biosurfactant, Trichoderma viride, Bioremediation, Hydrocarbon degradation, Emulsification index*

Correlation between masticatory function and sarcopenia – can masticatory sarcopenia be mooted as a new diagnosis

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Sarcopenia, characterised by progressive loss of muscle mass and function, has been increasingly associated with functional decline in the stomatognatic system, including impaired masticatory efficiency. However, the relationship between masticatory function and sarcopenia remains underexplored. This study aimed to evaluate the association between masticatory efficiency and sarcopenia in prosthodontically rehabilitated middle-aged and elderly individual and to explore the concept of "masticatory sarcopenia" as a potential clinical entity. A total of 20 participate (10 males and 10 females) aged 50-65 years were included. Masticatory efficiency was assessed using a two- colour chewing gum mixing test quantified on a 0-10 visual analog scale (VAS), while sarcopenia was evaluate using handgrip strength (HGS) with established cut-off (<30 kg for males and <20 kg for females). Data were analysed using independent t-test for compare mean VAS scores between sarcopenic and non-sarcopenic groups, and person's correlation test to assess relationships between variables, with significance set at $p<0.05$. The mean age and BMI were 56.35±4.63 years and 22.38±3.11 kg/m², respectively. Seven participants (35%) were classified as sarcopenic. The mean VAS score was significantly lower in sarcopenic individuals (2.43±0.53) compared to non-sarcopenic individuals (4.92±1.00) ($p<0.001$). A significant positive correlation was observed between HGS and masticatory efficiancy, whereas BMI showed no significant corelation with HGS. These findings indicate a strong association between reduced masticatory function and sarcopenia, supporting the need to consider masticatory impairment within the diagnostic and rehabilitative framework of sarcopenia. Further large-scale studies are warranted to validate "masticatory sarcopenia" as a distinct clinical condition.

Keywords: *Masticatory Function, Sarcopenia, Hand Grip Test, Two-colour Chewing Gum VAS Score, Body Mass Index*

Gas Chromatography-Mass Spectrometry Based Profiling of Plasma Metabolic Signatures in Severe OSA

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Obstructive Sleep Apnoea (OSA) is a common sleep-related breathing disorder characterized by repeated episodes of partial or complete obstruction of the upper airway during sleep. Currently overnight polysomnography (PSG) is considered the gold standard for diagnosis; however, it is resource-intensive and not easily accessible. This has led to growing interest in alternative diagnostic approaches. Metabolomics, a high-throughput analytical technique, offers a promising strategy to identify disease-specific metabolic signatures and biomarkers. By analysing changes in the plasma metabolome, it may provide deeper insights into the pathophysiology of OSA and facilitate early, non-invasive diagnosis. This study aimed to perform comprehensive plasma metabolomic profiling in patients with severe OSA using Gas Chromatography–Mass Spectrometry (GC-MS), to identify potential metabolic biomarkers for the diagnosis of severe OSA, to understand the underlying pathophysiological mechanisms associated with OSA through metabolomic alterations and to evaluate the influence of disease severity and associated comorbidities on circulating metabolic profiles.
For this study Plasma from 50 severe OSA cases (49.74 ± 11.87 years; AHI >30 events/hour confirmed by polysomnography and clinical assessment) and 30 age-appropriate controls (39.20 ± 3.29 years) underwent comprehensive untargeted GC-MS metabolomics. Profiling revealed 92 dysregulated metabolites with perturbed pathways in OSA versus controls. Standout upregulated signals included indoxyl sulphate (renal pathology), 5-hydroxytryptamine (cardiovascular vulnerability), and 5-aminolevulinic acid (oxidative damage). In conclusion, these plasma metabolomic profiles herald non-invasive tools for real-time OSA comorbidity surveillance and personalized precision medicine.

Keywords: *Apnoea-hypopnea index (AHI), plasma metabolome, Gas chromatography-mass spectrometry, biomarker discovery, comorbidity monitoring*

Urinary Metabolite Signatures Reflect the Altered Host Metabolism in Severe Obstructive Sleep Apnea

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Severe obstructive sleep apnoea (OSA) is a common sleep-related breathing disorder characterized by recurrent upper airway obstruction during sleep, leading to intermittent hypoxia, systemic inflammation, and metabolic dysfunction. Despite its significant cardiovascular and metabolic consequences, there remains a need for reliable, non-invasive biomarkers for early detection and monitoring of the disease. Therefore, this study aimed to identify urinary metabolite signatures associated with severe Obstructive sleep apnoea and evaluate their potential utility as biomarkers for disease screening. An untargeted metabolomics approach using gas chromatography–mass spectrometry (GC–MS) was employed in a case–control study involving 72 participants, comprising 36 patients with severe Obstructive sleep apnoea diagnosed by polysomnography (apnea–hypopnea index ≥30) and 36 healthy controls. Urine samples were collected and subjected to metabolite extraction, derivatization, and GC–MS analysis, followed by univariate and multivariate statistical analyses, including orthogonal partial least-squares discriminant analysis (OPLS-DA), to identify discriminatory metabolic profiles. The analysis revealed 142 significantly altered urinary metabolites in patients with severe Obstructive sleep apnoea compared with healthy controls. Among these, gamma-aminobutyric acid (GABA), malic acid, glutamic acid, and epichoric acid demonstrated excellent diagnostic performance, with accuracies ranging from 99.8% to 100% for Obstructive sleep apnoea screening. Pathway enrichment analysis identified significant disturbances in the tricarboxylic acid cycle, glutamate and glutamine metabolism, amino acid metabolism, and fatty acid metabolism, indicating substantial metabolic dysregulation in severe Obstructive sleep apnoea. These findings suggest that urinary metabolomic profiling may serve as a robust, non-invasive approach for large-scale Obstructive sleep apnea screening while also providing novel insights into the metabolic alterations underlying disease pathophysiology.

Keywords: *Obstructive sleep apnoea, Urinary metabolomics, Gas chromatography–mass spectrometry, Biomarkers, Metabolic dysregulation*

Analytical Comparison of Wind Pressure and Structural Response Using AS/NZS 1170.2, BS 6399-2, EN 1991-1-4, and IS 875 Part 3

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The Maldives is a low-lying archipelago with an average elevation of approximately 1.5 m above mean sea level. Owing to the absence of significant orographic barriers, the islands experience largely unobstructed airflow, making the built environment highly vulnerable to wind loading. This highlights the importance of accurately determining design wind speeds for structural safety. Since the Maldives lacks a dedicated national wind loading code, a comparative analysis was conducted using the Australian/New Zealand Standard AS/NZS 1170.2, British Standard BS 6399, Indian Standard IS 875, and European Standard EN 1991-1-4. For the analysis, a 50m high (16 storey) rectangular office building, representative of common high-rise structures in Malé, was considered. The structure was assumed to be in a non-cyclonic open terrain subjected to a 50-year return period wind speed of 44 m/s, corresponding to the highest recorded wind speed in the Maldives. The study revealed significant variations among the selected codes in estimating wind pressure and dynamic effects. IS 875 tends to underestimate wind pressure beyond heights of 40, while EN19911-4 incorporates a more detailed treatment of atmospheric turbulence. BS 6399 and EN 1991 provide more refined terrain classifications compared to the broader categories in IS875, which may lead to overdesign in certain conditions. AS/NZS 1170.2 was found to be the most conservative, particularly for tall and slender buildings with natural frequencies below 1Hz, producing 12-15% higher design loads due to its rigorous dynamic gust factor approach.

Keywords: *Orographic barriers Design wind speed, Atmospheric turbulence, Natural frequency, Dynamic gust factor*

Design And Characteristic of Lansoprazole Mucoadhesive Drug Delivery System

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Mucoadhesive drug delivery systems are designed to interact with the mucus layer covering mucosal epithelial surfaces, thereby increasing the residence time of dosage forms at the absorption site. These systems are particularly beneficial for drugs that require prolonged gastric retention or act locally in the gastrointestinal tract. The present study focused on the formulation and evaluation of mucoadhesive tablets of lansoprazole for the treatment and prevention of stomach and intestinal ulcers, with the aim of enhancing gastric residence time and improving bioavailability. The tablets were prepared by the wet granulation method using different grades and concentrations of natural polymers such as HPMC K4M, HPMC K15M, sodium alginate, xanthan gum, and guar gum in concentrations ranging from 5% to 10% w/w. Combination polymer formulations were also developed to evaluate synergistic effects on mucoadhesion and drug release behaviour. The prepared formulations were evaluated for pharmacopeial quality control parameters including weight variation, hardness, friability, content uniformity, swelling index, surface pH, in-vitro drug release, and mucoadhesive strength. FTIR studies confirmed the absence of incompatibility between the drug and excipients. Stability studies conducted for three months at 40°C and 75% relative humidity revealed no significant changes in physicochemical properties or drug release profiles. The findings demonstrated that optimized polymer concentrations improved gastric retention and enhanced the bioavailability of lansoprazole. The developed mucoadhesive tablets were found to be stable, effective, and suitable for the treatment of stomach and intestinal ulcers.

Keywords: *Mucoadhesive drug delivery systems, Lansoprazole, wet granulation method, Stability studies*

Smile Design of digital Dentistry

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Digital Smile Design (DSD) is an emerging digital workflow that enhances aesthetic treatment planning by integrating facial analysis, digital imaging, and restorative dentistry. The objective of this study is to evaluate the role of DSD in improving the predictability, communication, and clinical outcomes of aesthetic dental treatments. A narrative review approach was used to examine current evidence and clinical applications of DSD. Relevant literature and clinical protocols involving digital photography, video analysis, facial measurements, smile simulation software, and CAD/CAM-generated mock-ups were reviewed to assess their contribution to smile planning and treatment execution. The findings indicate that DSD facilitates comprehensive evaluation of facial and dental characteristics, enhances communication among patients, clinicians, and dental technicians, and improves patient understanding and acceptance of proposed treatments. The technology also supports individualized treatment planning, allowing clinicians to customize smile designs according to each patient's aesthetic expectations and facial features. Reported benefits include improved visualization of treatment outcomes, greater workflow efficiency, and increased predictability of restorative and prosthodontic procedures. However, limitations such as software costs, operator dependency, and the requirement for specialized training remain. In conclusion, DSD represents a valuable advancement in digital dentistry, providing an effective framework for aesthetic assessment, collaborative treatment planning, and enhanced patient-centred care.

Keywords: *Digital Smile Design, Digital Dentistry, Aesthetic Dentistry, CAD/CAM, Treatment Planning*

The Discernible Concurrence of Iron Deficiency Anemia and Vitamin D Deficiency: An Analytical Study Among the Pediatric Population

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Iron deficiency anaemia (IDA) and vitamin D deficiencies are two of the most prevalent micronutrient deficiencies among children worldwide. Studies on iron and vitamin D suggest that levels of iron in the body can be influenced by vitamin D and vice versa. Although IDA and vitamin D deficiency are common among the paediatric population of Maldives, no studies have been done to identify the proportion of children affected or to establish an association between them. Methodology: This research is a hospital-based retrospective case-control study including children with IDA as case group Università degli studi di Milano p, and children without IDA as the control group, who attended Indira Gandhi Memorial Hospital (IGMH) from January 2023 to December 2025. The required laboratory data were obtained through the IGMH medical records. The proportion of anaemia, iron deficiency, IDA and vitamin D deficiency in the study population was evaluated. For data analysis, descriptive statistics was used to summarize baseline characteristics while Chi-Università degli studi di Milano square analysis was used to assess the association of IDA and vitamin D deficiency. The results showed that among the paediatric population attending IGMH, 29% were anaemic, 53% were iron deficient, 24% had IDA and 51% had vitamin D deficiency. In addition, among children with IDA, a significantly higher proportion of children had vitamin D deficiency ($p = 0.002$). Conclusion: The research findings highlight the importance of early screening and evaluation of iron and vitamin D levels simultaneously, thereby reducing long term health consequences of such deficiencies and promoting healthier developmental outcomes in Maldivian children.

Keywords *Case-control study Case-control study, Vitamin D deficiency, Paediatric Population, Maldives*

Multi-specific coral spawning and monsoonal transitions: assemblage-level observations from Baa Atoll, Maldives

Amelia Errington, Kate Moody, Mumuksa Sandrasagra, Thomas Le Berre
Reefscapers

Coral reefs support a vast diversity of marine life but are increasingly threatened by anthropogenic activities. To assess changes in community composition and the recovery potential of coral reefs in a changing climate, documenting sexual reproduction and understanding its environmental drivers are essential. Here, we report the timing and reproductive strategies for 375 individual coral colonies across 28 species from 10 genera between February 2024 and April 2025 at a near-shore reef in Baa Atoll, Maldives. We identify two peak periods of multi-specific spawning, coinciding with monsoonal transition seasons, around March–April and November–December. We note variations in spawning patterns within and between taxa, documenting the occurrence of extended breeding via asynchronous spawning of colonies within a species and split-spawning of individual colonies across lunar months and bi-annual seasons. Our results show that larger spawning events throughout the year are significantly correlated with lower wind speeds, highlighting multi-specific spawning during March–April and November–December. Average daily wind speeds were lowest during these periods, with April 2024, November 2024, and April 2025 recording 2.08 m/s, 1.88 m/s, and 2.05 m/s, respectively. Additionally, our study found that coral spawning intensity increases at or immediately after peaking solar insolation, coinciding with the same two spawning periods. This supports other studies' hypothesis that timing spawning to occur after peaking solar insolation may serve as an evolutionary advantage to improve larval viability and reduce post-spawning stress on parent colonies (Yakovleva et al., 2009; Hoegh-Guldberg and Jones, 1999). These findings highlight the influence of environmental cues on the timing and extent of coral reproduction and provide detailed spawning records for several non-Acropora genera in the Maldives, contributing a critical baseline for future research. These results improve our understanding of coral reproductive phenology through continuous tracking of spawning dynamics.

Keywords: *Coral Spawning, Coral Reefs, Reproduction Multi-specific spawning , Monsoonal transitions*

From Fingerlings to Plate: An Integrated Multi-Trophic Approach to Grouper Aquaculture

Akbar Ahmed, Isidora Carvajal, Kamille Le Berre, Marie Saleem Le Berre
Reefscaper

Advancing aquaculture technology is creating a strategic opening for the Maldives to satisfy local seafood demand through marine cultivation, alleviating pressure on wild fish stocks and costly imports. Grouper aquaculture presents a promising opportunity for sustainable production nationwide. This study evaluated the growth performance of Brown-Marbled grouper (Epinephelus fuscoguttatus) reared in a controlled system of ten 1,000-liter flow-through fiberglass tanks with sand filtration. Alongside this study, we conducted a parallel trial in an ocean sea cage, adjacent to the island. A total sample size of 400 individuals was utilized through a progressive batch stocking approach (300 in tanks, 100 in the sea cage). To ensure animal welfare and minimize competition, groupers were regularly graded by size; consequently, stocking densities were dynamically managed based on biomass, maintaining a maximum of 12 kg per tank. Data collection involved daily monitoring of feed consumption and monthly weight measurements to track growth. Effluent water in the tank system was treated in a remediation pond where Caulerpa racemosa assimilated nitrates. Groupers reached market size (~1 kg) in 8–12 months with a feed conversion ratio of ~3:1. Comparative observations with parallel sea-cage trials indicated faster growth in open systems due to superior natural water exchange and water quality. Survival rates averaged 60%, with losses linked to equipment failure or handling stress. Harvested fish were marketed to an on-site resort, demonstrating a vertically integrated farm-to-table model. This study confirms the technical feasibility of small-scale grouper aquaculture, although scaling requires further research into alternative proteins and automation.

Keywords: *Aquaculture, Sustainability, Groupers, Multi-trophic, Fingerlings*

Clinical Course and Necropsy Findings in Two Cases of Chronic Renal Disease in Olive Ridley Turtle (Lepidochelys olivacea)

Olivia Barry, Ignacio Tagua Vasquez, Alejandra Maestro, Thomas Le Berre
Reefscapers

Renal disease is a common problem in Olive Ridley turtles (Lepidochelys olivacea) undergoing rehabilitation, but it is still poorly understood, especially in field conditions where diagnostic tools are limited. This report describes the clinical signs and necropsy findings of two turtles admitted to a rehabilitation facility in the Maldives. Both turtles showed similar signs, including lethargy, abnormal buoyancy, severe hypoglycemia (<20 mg/dL), severe anemia (hematocrit 5% and 11%), fluid buildup in the body, and swelling under the skin. Blood tests also showed very high uric acid levels (>20 mg/dL), suggesting severe kidney dysfunction. The progression of disease differed between the two turtles. One died within 24 hours of admission, while the second survived for approximately 15 days and later developed neurological signs and blindness. Although kidney disease was suspected during treatment, a definitive diagnosis was only possible after death. Necropsy revealed severe kidney damage in both animals, including major structural changes. One turtle also showed cyst-like changes in the kidneys, consistent with polycystic renal disease. No urate deposits were found despite the high uric acid levels. These findings confirm chronic renal disease in both turtles and show that the condition can present and progress differently between individuals. This study highlights the importance of necropsy in diagnosing disease in sea turtles, particularly in rehabilitation settings where clinical diagnostic tools are limited.

Keywords: *Olive Ridley, Renal Disease, Rehabilitation, Necropsy, Pathology*

Impacts Of Cancer on Maldivian Men and Their Adjustment to Life: A Qualitative Study.

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Cancer among men is a major public health concern and a leading cause of death worldwide. Among both genders, men are more likely to be diagnosed with cancer than women, and the Maldives is no exception. Limited evidence exists on the impact of male cancer and its adjustment to life among men. Therefore, it is crucial to understand the contextual experiences to support men living with cancer and identify ways to improve their quality of life. The purpose of this study is to explore the experiences, challenges, and life adjustments of men living with cancer in the Maldives. A qualitative descriptive study was conducted for Maldivian men living with cancer. Nine participants were recruited through snowballing and purposive sampling. Data were gathered using semi-structured in-depth interviews and analysed using reflective thematic analysis. Trustworthiness was enhanced through peer debriefing, member checking, and an audit trail. Five key themes emerged from the study: 1) adjustment to live with chemotherapy, 2) service experience, 3) family support,4) strong belief in faith, and 5) display of bravery manifested in vulnerability in sharing the truth, tackling one's own emotions, and managing family members. The study revealed that living with chemotherapy was a challenge and required a huge effort to adjust to the new life. Recognized the urgent need for service improvement. Further research is recommended, such as a comparative study, on different cancer types and visible masculine types.

Keywords: *Male cancer challenges, experiences, Maldives, Impact, adjustment*

"Environmental Gaseous toxicant- induced reproductive health disorders in Wistar Rats"

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Environmental pollution by gaseous toxicants has become a major global concern due to its effects on human health. The major gaseous pollutants (NOx, SO2, CO, volatile organic compounds) can enter the body through inhalation and subsequently exert systemic effects by inducing inflammation, oxidative stress and endocrine disruption. We focus on mechanisms underlying gaseous toxicant-induced reproductive dysfunction in males and females. Through multidisciplinary approaches our group has performed studies in male wistar rats, in an indigenous self-fabricated whole-body exposure chamber, in collaboration with IIT-Delhi. We exposed rats to the filtered diesel exhaust (FDE) for 6 weeks (n=6) and assess the reproductive function by measuring sperm parameters, histopathology of testis, levels of hormones of Hypothalamo-pituitary-Gonadal axis along with concentrations of xenobiotic agent specific antioxidant enzyme (GST). In another group we studied the interventions of small molecule antioxidants as protective agents. Follow up study was performed for the transgenerational effect of gaseous toxicant exposure. The aim of the research was to to identify the fabrication and development of whole-body exposure (WBE) unit, to Study the effect of FDE in reproductive function of male wistar rats, to study the effect of small antioxidant molecules on above and to follow up to second filial generation Exposure to FDE significantly affected the reproductive parameters studied without much alteration in the hormonal mileu. Effect continues into the unexposed filial generations. The observations suggest long-term and transgenerational health effects of environmental gaseous toxicants could be mediated by oxidative stress and thereby support the progress of effective preventive measures by antioxidants

Keywords: *Microenvironment, Diesel Exhaust toxicants, Antioxidants, Reproductive Health, Wistar Rats*

Remote Sensing-Based Mapping of Seagrass Ecosystems in the Maldives Using Google Earth Engine

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Seagrass ecosystems are among the most valuable coastal habitats, providing critical ecosystem services such as carbon sequestration, shoreline stabilization, and support for marine biodiversity. Despite their importance, spatially explicit and up-to-date information on seagrass distribution in the Maldives remains limited, constraining effective conservation and management. This study aims to map the distribution of seagrass habitats in the shallow reef environments of the Maldives using a cloud-based remote sensing approach. Multispectral Sentinel-2 imagery was processed within the Google Earth Engine platform to generate cloud-free composite images for the study area. A supervised classification approach was applied using a machine learning algorithm trained on field-informed point datasets consisting of approximately 1500 seagrass points and 3500 non-seagrass points. The dataset was split into 70% for training and 30% for validation to ensure robust model performance assessment. Predictor variables included visible and near-infrared spectral bands, along with derived indices to enhance class separability in shallow water environments. The classification results demonstrated a reliable capacity to distinguish seagrass from other benthic and substrate types, with overall accuracy assessed using a confusion matrix indicating satisfactory model performance. The resulting high-resolution spatial outputs provide detailed maps of seagrass distribution, identifying key areas of ecological significance across the study sites. These findings highlight the effectiveness of integrating satellite remote sensing and cloud computing for scalable and repeatable mapping of blue carbon ecosystems. The approach presented in this study offers a cost-effective and transferable framework for national-scale seagrass monitoring and supports evidence-based decision-making for marine spatial planning, conservation prioritization, and climate-related reporting in the Maldives.

Keywords: *Seagrass, Remote sensing, Google Earth Engine, Mapping*

Exploring the Perception and Challenges of Ayushman Bharat Beneficiaries in Uttarakhand: A Mixed Methods Study

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Ayushman Bharat–Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) aims to improve financial protection and healthcare access. This study explored beneficiaries' perceptions and challenges in availing services under AB-PMJAY in Uttarakhand. A convergent parallel mixed-methods study was conducted at a tertiary care hospital between September 2020 and April 2021. A consecutive sample of 104 AB-PMJAY beneficiaries completed a structured questionnaire. Eleven purposively selected beneficiaries participated in in-depth interviews until thematic saturation was achieved. Quantitative data were analysed descriptively, qualitative data underwent thematic analysis, and findings were integrated through triangulation. The mean age of participants was 42.6 ± 15.6 years, and 75% were male. Most beneficiaries agreed that the scheme should be available in all hospitals (77.9%), and 76.0% considered the ₹5 lakh coverage adequate. Major challenges included inadequate awareness and community sensitization (72.1%), high outof-pocket expenditure despite coverage (59.6%), difficulty accessing healthcare facilities (58.7%), poor service delivery including lack of medicines and consumables (52.9%), and inadequate infrastructure and manpower (50.0%). Qualitative findings identified five themes: awareness, perceived benefits, access barriers, service delivery challenges, and recommendations for improvement. Continued out-of-pocket expenditure was largely attributed to non-availability of medicines and limited coverage of follow-up and outpatient services. In conclusion, AB-PMJAY improved access to inpatient care and reduced financial burden. However, awareness gaps, operational barriers, medicine shortages, and continued out-of-pocket expenditure limited its effectiveness. As a single-centre study, generalizability is limited. Future multicentre studies are warranted. Strengthening implementation and expanding service coverage may enhance beneficiary experience and financial risk protection

Keywords: *Ayushman Bharat scheme, Perception, Challenges, Health insurance, Pradhan Mantri Jan Arogya Yojana*

Physics-Informed Coastline Extraction in Atoll Environments: A Case Study of the Maldives

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Coastal land segmentation from satellite imagery is essential for monitoring sea-level rise in vulnerable island nations. However, shallow water exhibits similar reflectance to dry land, causing systematic misclassification at reef boundaries. Recent advances have utilized large-scale Geospatial Foundation Models (e.g., Prithvi) to address such challenges through extensive pretraining. We demonstrate that while these models excel in familiar environments, they fail to generalize to unseen atoll structures because they rely primarily on surface texture. We propose a resource-efficient alternative: a lightweight U-Net trained solely on Satellite-Derived Bathymetry (SDB) ratios. Evaluated on a Maldives benchmark using rigorous spatial cross-validation, our physics-informed model (31.0M parameters) significantly outperforms the fine-tuned Prithvi-300M model on new atolls, achieving an IoU of 0.878 compared to Prithvi's 0.698. Most critically, the Foundation Model fails to capture precise shorelines in previously unseen atolls (Boundary F1 0.46), whereas the physics-informed approach maintains high precision (Boundary F1 0.83). These results indicate that for shoreline delineation in Maldivian atolls, embedding physical knowledge of water depth is more effective than scaling model size or training data volume, offering a practical, low-cost tool for national coastal monitoring.

Keywords: *Physics-Informed Deep Learning, Satellite-Derived Bathymetry, Foundation Models, Coastal Segmentation, Generalization*

Elucidating the Molecular Interactions Between Multiple sclerosis and SARS-CoV-2 Utilizing Integrated Transcriptomics, ceRNA Network Analysis and Machine Learning Techniques

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Multiple sclerosis (MS) is an autoimmune neurodegenerative disorder characterized by inflammation, demyelination, and axonal degeneration. Emerging evidence suggests that SARS-CoV-2 infection may induce immune dysregulation and neuroinflammation, potentially contributing to the onset or progression of MS. In spite of this knowledge, we still do not have a complete understanding of the molecular mechanisms that link MS to SARS-CoV-2. A systems biology approach was used to identify shared molecular signatures, regulatory networks, and potential therapeutic targets between MS and SARS-CoV-2. Transcriptomic datasets from GEO and NCBI-SRA were used to identify shared DEGs between MS and SARS-CoV-2 and characterize their biological functions through enrichment and pathway analyses. Protein–protein interaction (PPI) network analysis enabled the identification of key hub genes associated with disease pathogenesis. In this study, competitive endogenous RNA (ceRNA) networks were analysed for insights into lncRNA, miRNA, and mRNA-mediated post-transcriptional regulation. Machine learning approaches, such as Random Forest and LASSO regression, were also employed to identify biomarker signatures that may be useful in diagnosing MS and identifying potential therapeutic targets. Through this comprehensive study, common immune, inflammatory, and antiviral pathways shared between MS and SARS-CoV-2 were identified, along with key regulatory molecules that may serve as potential therapeutic targets. In addition to providing a better understanding of neuroimmune interactions, the findings enabled the development of precision strategies for the management of neurological complications associated with MS and COVID-19.

Keywords: *Multiple Sclerosis, SARS-CoV-2, Transcriptomics, ceRNA Network, Machine Learning*

Integrated Analysis of Epitranscriptomic Modifications and Signalling Pathways in Glioblastoma

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Glioblastoma (GBM) continues to pose a major clinical challenge owing to its profound molecular heterogeneity, therapeutic resistance, and highly dynamic tumour microenvironment. Recent advances in high-throughput sequencing technologies and computational biology have highlighted pivotal role of epitranscriptomic modifications as key regulators of GBM pathogenesis. Although dysregulation of RNA-modifying enzymes and their associated regulatory networks has been implicated in tumour initiation, progression, and therapeutic response, underlying mechanisms remain poorly understood. In present study, we performed a comprehensive computational and biological investigation of epitranscriptomic regulators altered in GBM and evaluated their functional consequences in disease progression. Our analyses identified members of Cytidine Deaminase family as one of the most significantly dysregulated groups associated with glioblastoma pathobiology. Functional characterization revealed their involvement imperturbation of multiple oncogenic signalling pathways, including PI3K/AKT and Wnt/β-catenin pathways. Downstream target analysis further demonstrated extensive dysregulation of CC chemokine family, suggesting a critical role in coordinating epigenetic regulation, transcriptional remodelling, RNA-mediated interactions, and cellular processes that drive malignant transformation. Moreover, aberrant expression of these regulators appeared to contribute to therapeutic resistance, immune evasion, and adaptive remodelling of tumour microenvironment under hypoxic and inflammatory conditions. Collectively, our findings underscore value of integrative computational and biological approaches in deciphering functional impact of epitranscriptomic dysregulation in GBM. Identified regulatory networks represent promising candidates for diagnostic and prognostic biomarker development and may offer novel therapeutic opportunities. A deeper understanding of epitranscriptomic alterations could facilitate advancement of precision medicine strategies and improve clinical management of glioblastoma.

Keywords: *Glioblastoma (GBM), Epitranscriptomics, Cytidine Deaminase Family, CC-Chemokines, Tumour Microenvironment*

Maldives Roadmap to 30x30: Advancing GBF Target 3 Through Protected and Conserved Areas and OECMs

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The Maldives is a large ocean state with approximately 99% of its territory in the marine environment and globally significant biodiversity across coral reefs, seagrass beds, mangroves, lagoons, and pelagic waters, which underpin national livelihoods and economic sectors including tourism and fisheries. However, climate change and human pressures are escalating, creating an urgent need for strengthened area-based conservation to support biodiversity, ecosystem services, and climate resilience. This roadmap provides a national framework to advance Target 3 of the Kunming–Montreal Global Biodiversity Framework (GBF) by guiding the Maldives toward effectively conserving and managing at least 30% of coastal and marine areas by 2030 through protected areas and Other Effective Area-based Conservation Measures (OECMs), as a supporting document to the National Biodiversity Strategy and Action Plan. The roadmap applies a structured review across the eight elements of GBF Target 3, synthesizing available national and global datasets, policy and regulatory context, and stakeholder inputs from national conservation forums and technical committee engagement. The assessment identifies that while the Maldives has established 93 protected and conserved areas, overall marine coverage remains very limited relative to national waters, with notable gaps in offshore protection, ecological representativity, connectivity, and management effectiveness. It also highlights opportunities to expand coverage through new designations and diversified OECM pathways beyond tourism, strengthen management plans and monitoring frameworks, integrate climate considerations and improve compliance capacity through sustainable financing and ranger workforce development. The roadmap emphasizes inclusive and equitable governance, including decentralised roles, stakeholder engagement mechanisms, and rights-respecting approaches informed by Gender Equality, Disability and Social Inclusion considerations. Implementation led by the Ministry of Tourism and Environment in collaboration with national agencies, councils, NGOs, and partners is expected to accelerate progress toward 30x30 while supporting sustainable livelihoods and long-term resilience.

Keywords: *Marine Protected Areas Conservation, Environment, Global Biodiversity Framework, Convention on Biological Diversity*

Multi-modal Fusion for Rug Pull Detection in Blockchain Smart Contracts

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Decentralized finance (DeFi) has emerged as a major application of blockchain technology, enabling transparent and decentralized financial services through smart contracts. However, the rapid growth of DeFi has also led to a significant increase in fraudulent activities, particularly rug pull scams, causing substantial financial losses and undermining trust in blockchain ecosystems. Existing rug pull detection approaches primarily rely on static code analysis or handcrafted opcode features. Such methods are often insufficient for detecting evolving rug pull behaviours, as malicious activities frequently manifest dynamically during token transfer and execution processes. In addition, the limited coverage of existing datasets and the severe imbalance between malicious and benign contracts further restrict the effectiveness and generalizability of current detection approaches. To address these challenges, this paper proposes a multimodal graph-based framework for rug pull detection in smart contracts. The proposed approach employs two parallel Transformer-based streams to jointly capture structural and semantic characteristics from runtime bytecode. The first stream models the control-flow graph (CFG) generated from runtime bytecode and incorporates opcode information, node degree statistics, and auxiliary structural features to represent dynamic behavioural patterns associated with rug pull activities. The second stream learns fine-grained semantic representations from opcode sequences using a BERT-based encoder. The representations produced by both streams are fused through an attention-based mechanism to generate the final prediction. Experimental results show that the proposed framework outperforms existing baselines under imbalanced settings. By jointly learning structural and semantic representations from runtime bytecode, the model achieves more robust detection of emerging rug pull patterns.

Keywords: *Smart Contract, Rug pull, Multi-modal, Blockchain, Generalization*

Decoding the Molecular Landscape of High-Risk Retinoblastoma Through Transcriptome Profiling

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Retinoblastoma is a rare and aggressive paediatric intraocular malignancy with considerable molecular heterogeneity. Despite advances in treatment, high-risk patients remain susceptible to relapse and poor clinical outcomes, highlighting the need for novel therapeutic targets. To address this, we compared gene expression profiles between non-high-risk and high-risk retinoblastoma tumours and identified dysregulated genes associated with disease progression. Among these, Polo-like kinase 1 (PLK1), a key regulator of cell cycle progression and mitosis, emerged as a promising candidate. To investigate its functional significance, we constructed an integrated regulatory network comprising microRNAs, transcription factors, and protein kinases associated with PLK1. Network analysis and Gene Set Enrichment Analysis (GSEA) revealed significant enrichment of pathways involved in cell cycle regulation, mitosis, and cellular proliferation, supporting a central oncogenic role for PLK1 in high-risk retinoblastoma. A drug discovery process against PLK1 was utilized to examine the possibility of treating cancer through structure-based drug development (also called structure-based drug design). A computational approach was used, which included molecular docking, molecular dynamics simulations, and binding free energy calculations. The virtual screening of the candidate compounds identified several small molecules as potential therapeutic candidates; of these candidates, two small molecules (1950 and 2760) showed the greatest binding affinity, stability of interaction, and predicted inhibitory activity against the PLK1 kinase domain. Computational modelling studies showed that these small molecule-targeted agents could inhibit PLK1-mediated signaling and inhibit the proliferation of tumour cells. The results provide evidence that PLK1 is an achievable target in high-threat retinoblastoma disease and demonstrate an effective approach (i.e., a combined transcriptomic and computer-based approach) for discovering new targeted therapies for children with cancer.

Keywords: *Retinoblastoma, Transcriptome profile, Biomarkers, Therapeutic targets, Molecular docking & simulation*

Tides of Nutrition: Breastfeeding Knowledge Among Mothers of Children Aged 0-2 years across Noonu and Kaafu Atolls in the Maldives.

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Malnutrition among infants and young children is a worldwide problem and it has been tied to mothers or caretaker's knowledge on breastfeeding and complementary feeding. According to WHO, fifty-two million children under five years of age are wasted, 17 million are severely wasted, 155 million are stunted, and 41 million are overweight or obese. Worldwide studies have shown that malnutrition-related factors are very similar globally. Most of the factors are related to gaps in knowledge among the mothers, the community or among the health professionals. The aim of this study was to identify the breastfeeding knowledge levels of mothers and to find out if there are any associations with mothers' level of breastfeeding knowledge and sociodemographic factors. Participants were 179 mothers who had a child between 0-2 years. Knowledge was assessed by giving a score of one for each correct answer. A cross-sectional survey was conducted by trained enumerators using a validated questionnaire. Descriptive and inferential statistics were conducted for the analysis. The majority (64.3%) of the mothers had a medium score on knowledge. There was a significant association between mother's knowledge and mother's employment sector (p=0.001), mother's education (p= 0.002), and household income (p=0.001). There was no significant association with mother's age (p= 0.12). Although 91% of mothers knew the correct age to exclusively breastfeed, 53.7% mothers said to give infant formula when separated from the child for a few hours. It is of utmost importance to conduct educational intervention on infant feeding for mothers with young children.

Keywords: *breastfeeding, knowledge, Mothers, Maldives*

Lipoid pneumonia presenting as severe acute respiratory distress syndrome following accidental petroleum ingestion: successful management with prone ventilation

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Lipoid pneumonia is an uncommon form of chemical pneumonitis resulting from aspiration of hydrocarbon substances and may lead to severe acute respiratory distress syndrome (ARDS). We report the case of a previously healthy 37-year-old man who developed severe ARDS following accidental aspiration and ingestion of petroleum during manual siphoning at work. The patient experienced immediate respiratory distress and subsequently developed altered mental status, necessitating endotracheal intubation at a referring hospital prior to transfer to a tertiary centre. On arrival, he was sedated and mechanically ventilated. Computed tomography of the chest demonstrated bilateral ground-glass opacities and consolidations consistent with ARDS. Bronchoscopy revealed diffuse inflammatory changes without evidence of an infective aetiology. Based on the clinical history, radiological findings, and bronchoscopic appearance, a diagnosis of lipoid pneumonia secondary to petroleum aspiration was established. The patient required prolonged intensive care management, including mechanical ventilation, multiple cycles of prone ventilation, and immunomodulatory therapy. His clinical course was complicated by ventilator dependence, ventilator-associated pneumonia, cardiac arrhythmias, and druginduced pancreatitis. Following 21 days of mechanical ventilation, he was successfully extubated and gradually weaned off supplemental oxygen, achieving significant clinical recovery. This case highlights the importance of early recognition of hydrocarbon-induced lipoid pneumonia and demonstrates the critical role of prone ventilation in the management of severe ARDS secondary to chemical pneumonitis. Prompt diagnosis and aggressive supportive care can result in favourable outcomes despite a prolonged and complicated intensive care unit course.

Keywords: *Lipoid pneumonia, Severe ARDS, Petroleum, Prone ventilation, Chemical pneumonitis.*

Effect of Nurse-Led Mhealth and Module-Based Educational Intervention on Self-Care Behaviour, Clinical Outcomes and Quality of Life Among Heart Failure Patients: Three-Arm Randomized Controlled Trial

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Heart failure affecting 64.3 million people worldwide and nearly 8–10 million individuals in India, is associated with poor quality of life, frequent hospitalization, increased mortality, and economic burden. Effective nurse-led educational interventions have shown beneficial effects in improving self-care, quality of life, and lifestyle behaviours among HF patients. However, evidence comparing these interventions in India is limited. Hence, this study evaluated the effectiveness of nurse-led mHealth and module-based educational interventions on self-care behaviour, clinical outcomes, and quality of life among patients with heart failure. A three-arm randomized controlled trial was adopted and 153 heart failure patients recruited from the department of cardiology. They were randomly allocated to the control group, the experimental group A and the experimental group B. Participants in experimental groups A received the nurse-led module-based educational intervention and experimental groups B received the mHealth educational intervention. Data were collected at baseline, 3 months and 6 months. The primary outcomes of the study were self-care behaviour, clinical outcomes, and QoL. Significant improvements were observed in haemoglobin ($p=0.044$), fasting blood sugar ($p=0.025$ at T1; $p<0.001$ at T2), blood pressure, NT-proBNP, lipid profile, HbA1c, creatinine, and urea levels ($p<0.05$ to $p<0.001$) among intervention groups. Quality of life, self-care behaviour, medication adherence, symptom status, and self-efficacy also improved significantly ($p<0.05$ to $p<0.001$), with greater improvement in the mHealth group. Unplanned hospital visits and admissions were significantly reduced ($p<0.001$), and mortality occurred only in the control group. Overall, the module-based and mHealth educational interventions were effective; however, the mHealth intervention showed greater improvement among heart failure patients.

Keywords: *Heart Failure, Mobile Health, Self Care, Quality of Life, Health Education, Randomized Controlled Trial*.

Effectiveness of Mulligan SNAG Mobilisation on Muscle Activation, Pain, Disability and Sleep Quality in Acute Neck Pain: A Randomised Controlled Trial

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Neck pain is a disabling problem faced frequently by people across the globe and acute neck pain is more prevalent among the adult age group due to posture abnormalities and dysfunctions. It is necessary to establish the treatment strategies to help reduce the disability. Aim: To determine the effect of Mulligan Sustained Natural Apophyseal Glide (SNAG) mobilisations on Electromyographic (EMG) activity of neck muscles, sleep quality, neck disability, pain and pain pressure threshold in acute neck pain and compare it with conventional rehabilitation. Methodology: A single-blinded randomised control trial with a sample of 32 subjects, recruited from Jamia Millia Islamia, Delhi, India. The study included adults with acute neck pain (NPRS score ≥6), and symptoms reproduced by neck motion. Participants were divided into two groups. Group-1 received intervention for neck pain in the form of Mulligan SNAG mobilisation along with cervical stabilisation exercises three times per week for four weeks. Group-2 received only cervical stabilisation exercises three times per week for four weeks. The effect of the two interventions was investigated using EMG neck muscles, sleep quality, neck disability, pain and pain pressure threshold, repeated measures ANOVA was applied for parametric variables and Wilcoxon Signed-rank Test wasused to establish the within group difference of non-parametric variables. Results & Conclusion: The result indicated that both the treatments improved the parameters. Group×Time interaction was found to be significant ($p>0.05$) in splenius muscle activity and group effect was significant ($p>0.05$) in pain pressure threshold, However, significant time effect was seen in all the variable ($p>0.05$). Mulligan SNAG mobilisation can be used as an adjunct to conventional exercise programmes to improve subjective sleep quality parameters, neck extensor muscle activity, neck disability, pain and pain pressure threshold in patients with acute neck pain.

Keywords: *Electromyography, Pain pressure threshold, Sustained natural apophyseal glide, Mulligan mobilisation*

Behind the Prison Walls: Stress, Burnout, and Health and Wellbeing of Correctional Officers in the Maldives

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Correctional officers operate in highly demanding and often hazardous environments, placing them at elevated risk of occupational stress, burnout, and compromised physical and psychological wellbeing. Despite their critical role in maintaining prison safety and security, empirical research examining the wellbeing of correctional officers remains extremely limited in the Maldivian context. This study aims to address this gap by examining levels of stress, burnout, overall health and wellbeing, and coping mechanisms among correctional officers working across prison facilities in the Maldives. The study employs a quantitative cross-sectional design involving correctional officers and civil staff employed in all government-run prison facilities. Data are being collected using a structured survey comprising standardized and validated instruments, including the General Health Questionnaire (GHQ-28), Maslach Burnout Inventory–Human Services Survey (MBI-HSS), Perceived Stress Scale (PSS-10), and the Brief COPE, alongside a demographic questionnaire. The instruments were translated into Dhivehi and underwent expert validation prior to data collection. Descriptive and inferential statistical analyses, including multiple regression, will be conducted using SPSS to examine patterns of wellbeing, stress, burnout, and coping responses, as well as associations with demographic and occupational factors. Data collection is currently underway, and analysis is pending. The anticipated findings are expected to provide critical insights into the occupational wellbeing of correctional officers in the Maldives and identify key stressors and coping strategies within this unique work environment. The study aims to inform evidence-based policy development and targeted interventions to enhance occupational wellbeing, mental health support, and sustainable workforce practices within the Maldivian corrections system.

Keywords: *Correctional officers, occupational stress, burnout, wellbeing, coping mechanisms, prisons, Maldives*

Normal kidney size evaluation using Ultrasound and Computed Tomography database in Maldivian general population presenting to Tertiary Hospital from 2021 to 2025

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Population based reference ranges in measuring normal kidney dimensions is important for assessing kidney disease as changes in kidney size is attributable to multiple factors. This study aims to estimate normal kidney size values for Maldivian adults with no renal impairment using abdominal and KUB Ultrasound and Computed Tomography records from the database of a tertiary hospital in the Maldives. This is a retrospective cross-sectional study in which measurements of both right and left kidneys were obtained from 383 participants and stored in an excel sheet. Descriptive statistics done using IBM SPSS 31. Analytical tests were performed using Pearson's correlation, T-test, ANOVA and Bland-Altman test. The mean length of the right kidney from USG was 10.04±0.98cm and the left kidney was 10.26±0.94cm. There was a significant correlation between age and mean kidney length, in both right and left kidney. Comparison of kidney length between genders showed no significant differences in USG and CT. Bland-Altman analysis showed moderate agreement between CT whole abdomen and USG whole abdomen. Bland-Altman analysis of CT urogram and USG KUB showed a good agreement between the two modalities. The average kidney length in Maldivian adult population with no known renal impairment, measured from USG was 10.04±0.98cm for right kidney and 10.26±0.94cm for left kidney, with no variation between genders. The population specific findings of this research may aid in clinical practice for early and accurate diagnosis of renal conditions and facilitate further research in this field.

Keywords: *Renal dimensions, Kidney, Ultrasound, Computed Tomography, KUB*

Impact of Dynamic Neuromuscular Stabilization Exercises on Pain, Functional Disability and Flexibility Among Office Workers with Mechanical Low Back Pain

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Mechanical low back pain is a subtype of back pain where the etiology is the spine, intervertebral discs, or the surrounding soft tissues. Mechanical low back pain tends to be more prevalent among office workers who sit for longer period maintain poor posture. The purpose of this study is to find out the Impact of Dynamic neuromuscular stabilization exercises on pain, functional disability and flexibility among office workers with mechanical low back pain. A total of 36 office workers (age 25-35) with mechanical low back pain were divided into two groups: Group A (n=18) performed Dynamic Neuromuscular Stabilization exercises, while Group B (n=18) underwent Strengthening exercises. Sessions lasted 40 minutes per day, three times a week for eight weeks. Outcome measures included NPRS, Oswestry Disability Index, and Sit and Reach test. In post-test analysis, both groups showed significant improvement in pain reduction, functional disability, and flexibility ($p < 0.05$). However, Group A demonstrated greater improvement, with significant differences in pre- and post-test scores. The unpaired 't' values for NPRS (7.45), Oswestry Disability Index (5.17), and Sit and Reach test (4.90) indicated superior outcomes in Group A compared to Group B. Thus, the study concluded that Dynamic neuromuscular stabilization exercises are effective in reducing pain, functional disability and improving flexibility among office workers with Mechanical low back pain.

Keywords: *Mechanical low back pain, Dynamic Neuromuscular Stabilization, Pain, Functional disability, Flexibility.*

Public Perception of Tap Water Usage for Drinking Purposes in the Maldives

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Access to safe drinking water is essential for public health and sustainable resource management. Despite the availability of utility-provided tap water in the Maldives, many residents continue to rely on alternative drinking water sources. This study aimed to examine public perceptions of tap water, identify factors influencing drinking water choices, and assess trust in utility water services among Maldivian residents. A quantitative cross-sectional survey was conducted among Maldivians aged 18 years and above residing in the Maldives. Data was collected through an online questionnaire distributed via social media and community networks, and 305 valid responses were included in the final analysis. Ethical principles of informed consent, confidentiality, and anonymity were maintained throughout the study. Findings revealed that bottled water was the primary drinking source for 50.8% of respondents, while only 6.9% reported consuming unfiltered tap water. Furthermore, 42.0% indicated that they never consume tap water for drinking purposes. Nearly half of the respondents (49.2%) reported a neutral level of satisfaction with utility tap water services. Separately, 51.5% reported experiencing taste, odour, or appearance-related issues with tap water. These findings suggest that perceptions of water quality, trust in service providers, and sensory experiences significantly influence drinking water preferences. The study concludes that improving transparency, communication regarding water quality testing, and addressing taste and odour concerns may enhance public confidence in tap water. Strengthening public trust in utility water could encourage more sustainable drinking water practices while reducing dependence on bottled water and the broader environmental impacts associated with plastic consumption.

Keywords: *Tap Water, Public Perception, Drinking Water, Bottled Water, Maldives*

A Hybrid CNN–Transformer Framework for ECG Arrhythmia Classification

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Cardiovascular diseases remain one of the leading causes of mortality worldwide, making the early detection of cardiac arrhythmias an important healthcare challenge. Electrocardiogram (ECG) signals provide valuable information about the electrical activity of the heart and are widely used for diagnosing abnormal heart rhythms. However, manual interpretation of ECG recordings is time-consuming and depends on the expertise of cardiologists. In recent years, deep learning techniques have shown significant potential for automating ECG arrhythmia classification. Convolutional Neural Networks (CNNs) are effective in extracting local morphological features from ECG signals, whereas Transformer networks are capable of learning long-range temporal relationships. This paper presents a Hybrid CNN–Transformer Framework that combines the complementary strengths of both architectures for automated ECG arrhythmia classification. In the proposed framework, the CNN branch extracts local heartbeat characteristics, while the Transformer branch captures global contextual information from the ECG sequence. The combined feature representation is then used for arrhythmia classification through a fully connected layer and Softmax classifier. The framework is evaluated using publicly available benchmark ECG datasets, including the MIT-BIH Arrhythmia Database, PTB-XL, and the Chapman-Shaoxing ECG Database. Standard evaluation metrics such as Accuracy, Precision, Recall, F1-score, and Area Under the Receiver Operating Characteristic Curve (AUC) are considered for performance assessment. The proposed framework aims to provide an effective and computationally efficient solution for ECG arrhythmia classification and demonstrates the potential of hybrid deep learning architectures in supporting intelligent clinical decision-making.

Keywords: *Electrocardiogram (ECG), Arrhythmia Classification, Convolutional Neural Network, Transformer, Hybrid Deep Learning*

The Effect of Cardiovascular Inflammation on Breast-Cancer Cell Adhesion and Transmigration to Human Brain Endothelial Cells During Metastasis Formation

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Breast cancer is the most common type of cancer in women worldwide. Metastases is the cause of 90% of cancer related death, mostly due to lack of effective clinical treatment. Most metastatic breast-cancer patients are > 60 years old. Which overlaps with the rise in cardiovascular comorbidities and inflammation. We investigated the effect of CVD-related inflammation on breast-cancer cell adhesion and transmigration to brain-endothelial cells in metastasis formation. This study focused on the key events during metastasis progression, the adhesion and transmigration of triple-negative breast cancer cells MDAMB231 to human brain-endothelial hCMEC/D3 cells. Brain-endothelial cells were seeded in microfluidic Ibidi-chips to obtain monolayers, then treated with CVD proinflammatory cytokines TNF-α+IFN-γ at different concentrations (0,1,10ng/ml for 24h). To assess the endothelial model of CVD-inflammation, expression of endothelial junction, VE-cadherin was assessed by immuno-cytofluorescence and imaged by confocal-microscopy. This CVD-model was used to perform the adhesion and transmigration assay with fluorescently labeled breast cancer cells incubated with hCMEC/D3 cells in a microfluidic Ibidi-chip. Cancer cell adhesion and transmigration was imaged at the confocal microscope and quantified with ImageJ. With inflammation, there is an increase in breakdown of cell junction proteins and delocalization of VE-Cadherin. CVD-related inflammation in hCMEC/D3 cells treated with pro-inflammatory cytokines TNF-α+IFN-γ increased both cancer cell adhesion and transmigration to and across brain endothelial cells. This data suggests that further research into CVD-related inflammation in relation to breast cancer metastases could lead to new interventions for breast cancer metastasis, potentially leading to IV treatments that do not have to bypass the blood brain barrier, to prevent, reduce or delay breast cancer metastasis recurrence.

Keywords: *Breast-cancer, Metastasis, Transmigration, Adhesion, Vascular.*

Effectiveness of Wolbachia-Infected Aedes aegypti Mosquitoes in Reducing Dengue Virus Transmission in the Maldives

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Dengue fever remains a major public health challenge in the Maldives, causing recurrent outbreaks, significant morbidity, healthcare burden, and economic losses. Annual outbreaks frequently exceed 1,000–3,000 reported cases, while the estimated direct costs of dengue illness and vector control exceed US$4 million annually. Conventional vector control measures have shown limited long-term effectiveness, highlighting the need for innovative and sustainable interventions. The use of Wolbachia-infected Aedes aegypti mosquitoes has emerged as a promising biological strategy due to its ability to inhibit dengue virus replication and transmission. To produce Wolbachia-infected native Aedes aegypti mosquitoes capable of reducing dengue transmission and supporting sustainable dengue control in the Maldives. This experimental study was conducted in three phases. Native Aedes aegypti mosquitoes were collected and screened for Wolbachia. Laboratory backcrossing techniques were employed to establish Wolbachia infections while preserving the genetic characteristics of local mosquito populations. Ecological fitness assessments, including flight capability studies, were conducted to determine the suitability of mosquitoes for field release. The intervention involves the planned release of Wolbachiainfected mosquitoes into wild populations. Preliminary findings confirmed successful backcrossing of Wolbachia-infected native Aedes aegypti. Flight studies demonstrated vertical dispersal capability equivalent to eight building floors, indicating suitability for urban environments. Preparations for controlled field release are underway. The successful establishment of Wolbachia-infected native mosquitoes demonstrates the feasibility of implementing this novel vector control strategy in the Maldives. The upcoming release phase will provide critical evidence regarding its effectiveness in reducing dengue transmission.

Keywords: *Dengue, Wolbachia, Aedes aegypti, Vector control, Maldives*

Parmar's Classification of Mechanical Injuries – A New Multidimensional Classification System: The S.P.I.N.E. (Source, Pattern, Involved tissue, Nature of force, Event context) Framework

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Mechanical injuries are among the most common forms of trauma encountered in emergency medicine, clinical practice, occupational health, and forensic investigations. Existing classification systems primarily focus on isolated parameters, such as anatomical location, wound morphology, or biomechanics, providing only a partial representation of injury. This fragmented approach inadequately integrates force origin, tissue involvement, and injury context, limiting comprehensive trauma characterization, standardized documentation, medico-legal interpretation, and multidisciplinary communication. To address these gaps, a novel multidimensional system - **Parmar's Classification of Mechanical Injuries**, termed the **S.P.I.N.E. framework** (Source, Pattern, Involved tissue, Nature of force, Event context) - is proposed. This framework is designed to provide a structured, systematic, and versatile approach to classify injuries. Unlike conventional classifications, S.P.I.N.E. simultaneously incorporates biomechanical origin, wound characteristics, layered tissue involvement, nature and magnitude of force, and circumstantial context. By integrating clinical, forensic, and legal perspectives, the model ensures that injury interpretation is both scientifically rigorous and medico-legally relevant. The S.P.I.N.E. framework has the potential to transform injury documentation, interpretation, and communication across multiple domains. For clinicians, it improves diagnostic accuracy and treatment planning. For forensic experts, it enhances objectivity in reconstructing events, assessing consistency of statements, and providing reliable expert testimony. In public health and occupational safety, it aids in standardized reporting and prevention strategies. Ultimately, Parmar's Classification bridges the gap between medical science and law, offering a globally adaptable tool for advancing forensic medicine, trauma research, and justice delivery.

Keywords: *Mechanical trauma, Injury classification, Trauma profiling, SPINE Framework, Parmar's Classification*

Exploring the Challenges and Needs of Final Year Undergraduate Nursing Students in Relation to OSCE Related Stress: A Qualitative Descriptive Study

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The Objective Structured Clinical Examination (OSCE) is widely recognized as a robust assessment method for evaluating the proficiency and preparedness of nursing trainees for clinical practice. Despite its effectiveness in assessing practical skills, evidence suggests that OSCEs are frequently associated with high levels of test anxiety and stress. The literature indicates that OSCE-related stress can adversely affect students, impair concentration, reduce recall of learned material, hinder decision-making, diminish confidence, and ultimately compromise examination performance. Significant contributors to OSCE-related stress include fear of failure, inadequate preparation time, negative peer influence, heavy academic workload, and limited academic support. While this phenomenon has been widely investigated internationally, there is limited evidence from the Maldivian context. This qualitative study investigated the challenges and needs of the final year undergraduate nursing students regarding OSCE-related stress and identified their support needs. Data was collected via semi-structured interviews with students who had completed the module Advanced Clinical Practice. Braun and Clarke's six-phase thematic analysis yielded five broad themes that reflect the multifaceted nature of OSCE-related stress. Collectively, the findings show that students' experiences were shaped by the interplay of psychological, academic, personal, and institutional factors, and underscore the need for more structured preparation and support. The study recommends strengthening institutional support through enhanced orientation, mock OSCE opportunities, timely and constructive feedback, stress management support, and stronger academic guidance. These findings offer context-specific evidence to inform nursing education and to strengthen assessment environments that support student well-being without compromising the rigor of clinical competency evaluation.

Keywords: *Test Anxiety, OSCE, Nursing Education, OSCE- related stress, Nursing students*

Expanding Cetacean Monitoring Across the Maldives Through Surveys and Citizen Science

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Reefscapers

Four odontocetes - spinner dolphins (Stenella longirostris), bottlenose dolphins (Tursiops spp.), short-finned pilot whales (Globicephala macrorhynchus), and Risso's dolphins (Grampus griseus) - are among the most frequently observed cetaceans in the Maldives and are regularly encountered during dolphin cruises and marine excursions. Monitoring these species is important for understanding population abundance, distribution, and movement patterns within the Maldives. This study combines long-term cetacean monitoring data collected from Kuda Huraa in North Malé Atoll and Landaa Giraavaru in Baa Atoll. Surveys were conducted during dolphin cruises and marine excursions, with photographic identification performed using dorsal fin images collected with high-resolution cameras and analysed using Darwin software. Surveys at Kuda Huraa have been conducted over the past eight years, while surveys at Landaa Giraavaru began in 2017 and occur approximately three times weekly, weather and guest attendance permitting. At Kuda Huraa, 784 individuals were identified, consisting of 448 spinner dolphins, 143 Indo-Pacific bottlenose dolphins (Tursiops aduncus), 122 pilot whales, and 61 Risso's dolphins, with an additional 10 false killer whales (Pseudorca crassidens) recorded. At Landaa Giraavaru, 788 individuals were identified, consisting of 575 spinner dolphins, 164 common bottlenose dolphins (Tursiops truncatus), 22 pilot whales, and 27 Risso's dolphins. Combined, 1,572 cetaceans were recorded across two Maldivian atolls. These findings provide valuable insight into cetacean population structure and their movement ecology. Reefscapers is further expanding monitoring through Koamas, a citizen science platform using a website and WhatsApp chatbot to collect verified cetacean sightings across the Maldives.

Keywords: *Cetaceans, Maldives, Photo-identification, Population monitoring, Citizen science*

Geographical Distribution and Uptake of Cancer Screening Services in the Maldives: Findings from a Nationwide Screening Program (2014–2025)

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The Cancer Society of Maldives (CSM) has conducted nationwide cancer screening programs since 2014 for five common preventable cancers: breast, oral, cervical, colorectal, and prostate cancer. This study aimed to examine the geographical distribution of screening services, participant demographics, and screening outcomes using secondary data from CSM screening initiatives. A descriptive retrospective analysis was conducted using secondary data collected between 2014 and May 2026 from participants attending screening camps across the Maldives. Data included geographic location, age, sex, cancer type screened, risk factor profiles and screening outcomes. Descriptive statistics were used to summarize screening coverage, participant characteristics, and outcomes. Between 2014 and May 2026, 40,845 screening tests were conducted across 20 atolls. A total of 18,007 individuals participated in the program, of whom 78.0% were female. Participants aged 30–44 years represented the largest age group (36.1%), followed by those aged 45–59 years (30.9%). Oral cancer screening accounted for the highest proportion of screenings (42%), followed by breast (34%), cervical (13%), colorectal (6%), and prostate cancer screening (5%). Screening uptake varied across regions, with the highest in Shaviyani Atoll (10.8%) and the lowest in Faafu Atoll (2.1%). The program identified (2.35 %) individuals with suspicious findings and referred them for further investigation and management. Geographic variations in screening participation highlight potential disparities in access to preventive health services. These findings demonstrate the value of community-based screening programs in improving access to early cancer detection and support the development of equitable national cancer screening strategies in the Maldives.

Keywords: *Cancer screening, Early detection, Screening uptake, Geographical distribution, Cancer prevention*

Maternal Factors Associated with Preterm Birth: A Case-control Study at Indira Gandhi Memorial Hospital

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Globally, prematurity is the major cause of newborn deaths. Preterm birth refers to delivery of a foetus before completion of 37 weeks of pregnancy. In 2020, 39.4% of newborn deaths resulted from prematurity in the Maldives. Despite its significance, there have been no prior published studies addressing maternal risk factors related to preterm birth in the Maldives. Consequently, the primary objective of this study is to identify the association between maternal risk factors and preterm birth. This research is a retrospective case-control study involving 415 pregnant women who delivered preterm infants (cases) and 415 women who delivered term infants (controls) who presented to the Reproductive Health Centre (RHC) of Indira Gandhi Memorial Hospital (IGMH) from January 2023 to December 2025. The data collection process began by identifying preterm cases in the RHC delivery register, followed by the selection of women who delivered gender-matched term infants (controls). After data collection was completed, descriptive and statistical analyses were conducted to assess the associations between maternal factors and preterm birth. After analysis adjusted for other factors under study, the highest chances of preterm birth were associated with placental diseases (AOR=5.92, 95% CI:2.40-14.61, p<0.001); diabetes mellitus (AOR=5.00, 95% CI:2.60-9.64, p<0.001), pre-eclampsia (AOR=4.48, 95% CI:2.41-8.33, p<0.001) and oligohydromnios (AOR=3.06, 95% CI:1.57-5.94 p=0.001). Maternal factors, such as diabetes mellitus, pre-eclampsia, and oligohydramnios, along with placental disorders, were found to exhibit a greater risk of preterm birth in comparison with mothers in whom these factors are absent, aligned with existing literature

Keywords: *Case-control study, Maternal factors, Preterm birth, Maternal health, Indira Gandhi Memorial Hospital.*

Prevalence, Identification and Management Gap of Coronary Artery Calcification (Cac) On Abdominal Staging Ct scan.

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Coronary Artery Calcification (CAC) is an established marker of coronary artery disease and an important predictor of adverse cardiovascular events. Although CAC is frequently visible on routine non-cardiac computed tomography (CT) scans, it is often under-reported, representing a missed opportunity to identify patients who may benefit from cardiovascular risk management. This quality improvement project aimed to determine the prevalence of incidental CAC among patients with suspected gastrointestinal (GI) malignancy referred for multidisciplinary team (MDT) discussion, evaluate current reporting practices, assess statin prescribing, and explore short-term cardiac outcomes in patients with incidental CAC. This study employed a retrospective review of 173 patients (CT chest images, radiology reports and electronic patient records) to identify presence of CAC on chest CT, determine whether CAC findings were documented on radiology reports, record baseline statin therapy use, and assess cardiac admission within six months of imaging. Analysis of data revealed that, incidental CAC was identified in 42.8% of patients with suspected GI malignancy, but this was only documented in 8.1% of radiology reports. Among patients with CAC, 16% were not prescribed statin therapy. Over a 6-month follow-up period, admissions to hospital with cardiac presentations were more frequent in patients not receiving statins than those on treatment (14.3% vs 6.5%). These results demonstrated that CAC is common but substantially under-reported in routine clinical practice, with associated gaps in preventative management. Improving awareness of incidental CAC, standardising radiology reporting, and establishing clear referral pathways could enhance cardiovascular risk assessment and support earlier preventative measures.

Keywords: *Coronary artery calcification, Computed Tomography (CT), Quality Improvement, Incidental Findings, Statin therapy*

Food Environment Around Schools in Malé, Maldives: A GIS-Based Assessment of Food Availability, Visibility and Accessibility

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School food environments influence dietary behaviours and may contribute to obesity and other diet-related non-communicable diseases (NCDs) among children and adolescents. Despite the growing burden of NCDs in the Maldives, limited evidence exists on food environments surrounding schools. This study assessed the availability, visibility and accessibility of foods and beverages sold around schools in Malé using a Geographic Information System (GIS)-based approach. A cross-sectional food environment audit was conducted among 30 food outlets located near schools in Malé, Maldives. Data were collected using a structured observational survey assessing outlet characteristics, food availability, product visibility, promotional practices and pricing. GIS mapping was used to examine outlet proximity to schools. Descriptive statistics were used to summarise food environment characteristics. Thirty food outlets were identified, of which 27 were open and included in the main analysis. GIS analysis showed that 70.0% of outlets were located within 100 m of a school, 96.7% within 200 m and all outlets within 400 m. Modern cafés/bistros (50.0%) and corner shops/marts (43.3%) were the most common outlet types. Among open outlets, ultra-processed foods and sugar-sweetened beverages were visually dominant in 66.7% and 59.3% of outlets, respectively, while hot displays containing hedhikaa or pastries were observed in 63.0%. Fresh fruit and vegetables were available in only 22.2% of outlets, and low-sugar beverage alternatives in 19.2%. Food outlets in Malé are highly concentrated around schools and are characterised by the predominance of ultra-processed foods, sugar-sweetened beverages and energy-dense snack foods. The limited availability of healthier alternatives suggests that students are routinely exposed to food environments that may promote unhealthy dietary behaviours. These findings provide important baseline evidence to support school food environment policies and nutrition-focused interventions in the Maldives.

Keywords: *School food environment, GIS, Children, Food availability, Maldives,*

Compensatory Growth in Hydra oligactis and the Effect of CuSO4

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Many organisms undergo compensatory growth as a response to a period of suboptimal conditions, such as starvation or time stress. The costs of this phenomenon are not widely understood. We use hydra, as they are an ideal model organism due to both their remarkable regenerative capabilities as well as their sensitivity towards metals such as Copper, and their extensive use in toxicity studies. In this experiment, the objectives are to carry out direct body size manipulation on Hydra oligactis to observe compensatory growth, and to determine the effect of this to Copper (II) Sulfate toxicity. Hydra was divided into two groups, namely Reduced and Control, and they were grafted accordingly and photographed before and after this procedure to measure body size using ImageJ. They were also photographed before carrying out the CuSO4 toxicity test. We then observed the morphological changes in hydra due to CuSO4 using the Wilby (1988) scale 48hrs after this test. Furthermore, Welch's t-tests and a Kruskal Wallis test was carried out to assess the significance of results obtained. Our results show that Reduced hydra did undergo a decrease in body size due to grafting, and half of them have undergone compensatory growth within this group. However, compensatory growth was not visible as compared to the Control group. Furthermore, when the Wilby scores from the CuSO4 toxicity test were observed, we found that both groups showed similar results in terms of toxicity. Therefore, compensatory growth was not found to have any effect on CuSO4 toxicity.

Keywords: *Hydra, Compensatory Growth, Copper (II) Sulfate*

Understanding Student Mental Health Support Needs, Help-Seeking Barriers, and Preferred Support Services in a University Setting

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University students experience a high burden of mental health problems, yet many do not seek professional support despite the availability of mental health services. Barriers such as stigma, limited mental health literacy, and concerns regarding accessibility contribute to low service utilisation. Within The Maldives National University (MNU), little is known about students' mental health support needs, their perceptions of existing support services, and the barriers that influence psychological help-seeking. This study aims to explore university students perceived mental health support needs, preferred forms of mental health support, perceptions of the availability, accessibility, and effectiveness of existing university support services, and barriers to seeking psychological help. A qualitative descriptive design will be employed using focus group discussions (FGDs). Purposive sampling will recruit approximately 20–40 students representing MNU's faculties and regional campuses. Eligible participants must be 18 years and older, enrolled in an undergraduate or postgraduate programme at MNU for a minimum of six months. FGDs will be conducted face-to-face or via a secure online platform and analysed using thematic analysis. Strategies including member checking and peer reviewing will be used to establish the trustworthiness of the findings. The study is expected to identify students' priority mental health support needs, preferred service delivery approaches, perceived strengths and limitations of existing university support services, and barriers that influence help-seeking. These findings are anticipated to provide an evidence base for strengthening student mental health services at MNU and contribute to the limited literature on student mental health in higher education within the Maldives.

Keywords: *Student mental health, Help-seeking behaviour, Help-seeking barriers, Mental health services, Student wellbeing*

Characterization of Leptochloa chinensis as a Sorbent for Diesel Bioremediation

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Diesel contamination poses a significant ecological threat to the coastal environments of the Maldives as primarily the country's heavy reliance on maritime transport. Conventional methods like chemical oxidants and surfactants act quickly but produce toxic by-products, risk secondary pollution, and lack long-term effectiveness, while bioremediation offers a more sustainable alternative by using biological processes to degrade contaminants naturally. This study investigates the potential of a locally sourced, Leptochloa chinensis grass species from the Maldives as a natural sorbent for the remediation of diesel-contaminated seawater by evaluating its performance in untreated and thermally pre-treated forms (60–140°C). In this study, sorption performance was assessed through three parameters: oil sorption capacity, diesel absorption efficiency, and seawater absorption efficiency, and seawater absorption efficiency. Optimization was employed using a one-factor-at-a-time (OFAT) approach to assess the effects of heat pre-treatment temperature, heating duration, packing density, and diesel concentration. Subsequently, response surface methodology (RSM) was employed, incorporating the Plackett–Burman Design (PBD) for screening significant factors and the Box–Wilson Central Composite Design (CCD) for model development and validation. Physicochemical characterization was performed using Attenuated Total Reflectance Infrared (ATR-IR) spectroscopy to identify functional groups involved in diesel binding. Preliminary trials identified 120°C as the optimal pre-treatment temperature, beyond which sorption performance declined. Further testing of the remaining variables is currently ongoing. This study aims to demonstrate the potential of Leptochloa chinensis as an economical, biodegradable, and bioremediation material for hydrocarbon pollution management, contributing to the development of green bioremediation technologies.

Keywords: *Bioremediation, Biosorption, One-Factor-At-A-Time (OFAT), Response Surface Methodology (RSM), Leptochloa chinensis*

Clinicopathological correlation and diagnostic sensitivity of fine needle aspiration cytology in thyroid carcinoma

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Thyroid carcinoma is the most common endocrine malignancy, and accurate preoperative diagnosis is essential for appropriate clinical management. Fine-needle aspiration cytology (FNAC) is the primary diagnostic modality for evaluating thyroid nodules; however, some lesions require histopathological examination for definitive diagnosis. This study aimed to evaluate the clinicopathological correlation and determine the diagnostic sensitivity of FNAC in patients with thyroid carcinoma. This retrospective observational study was performed at the Department of Pathology, AIIMS Bibinagar, comprising 174 cases with thyroid carcinoma based on FNAC diagnosis. Cytological specimens were classified based on The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC). Clinical information was collected from each patient, and all of them were surgically operated with histopathology as the gold standard. Out of total 174 patients, 132 (75.9%) were females and 42 (24.1%) were males with majority of patients falling in the age group of third to fifth decades (67.8%). Cytological diagnosis according to Bethesda criteria found Bethesda VI in 124 (71.3%) and Bethesda V in 50 (28.7%) patients. Histopathological examination found malignant tumours in 166 (95.4%) patients while there was discordance in 8 (4.6%) patients. Papillary thyroid carcinoma was found to be the most common variant (73.6%) followed by follicular carcinoma (12.6%), medullary carcinoma (6.9%), poorly differentiated/anaplastic carcinoma (4.6%) and rare variants (2.3%). FNAC showed 95.4% sensitivity with statistically significant correlation between cytological and histopathological diagnosis ($p<0.05$). It can be concluded that FNAC is a highly sensitive and reliable method for pre-operative diagnosis of thyroid carcinoma with excellent clinicopathological correlation and surgical management.

Keywords: *Thyroid carcinoma, Fine needle aspiration cytology, Clinicopathological correlation, Bethesda system, Sensitivity*

Reducing Excessive Sugar Consumption in the Maldives: A Policy Brief on Public Health and Economic Impacts

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The Maldives is experiencing a growing burden of diet-related non-communicable diseases (NCDs), driven in part by excessive consumption of sugar and sugar-sweetened beverages (SSBs). Rising rates of obesity, diabetes, cardiovascular diseases, and other chronic conditions have increased demand for healthcare services and placed substantial financial pressure on the government-funded Aasandha health insurance scheme. Preventive public health policies that reduce sugar consumption are therefore essential to improve population health and ensure the long-term sustainability of the healthcare system. This policy brief aims to examine the public health and economic impacts of excessive sugar consumption in the Maldives and to identify evidence-based policy interventions that can reduce sugar-related disease burden and healthcare expenditure. A narrative review was conducted using peer-reviewed articles, systematic reviews, cohort studies, and national and international reports published between 2015 and 2025. Data were obtained from the World Health Organization (WHO), World Obesity Federation, Maldives Bureau of Statistics, Health Protection Agency, Maldives Monetary Authority, and Aasandha.The review found that sugar-rich foods and beverages account for a substantial share of household food expenditure, while obesity, overweight, diabetes, cardiovascular diseases, and obesity-related cancers continue to increase. International evidence demonstrates that fiscal measures, particularly tiered SSB taxation, combined with front-of-package nutrition warning labels, restrictions on marketing sugary products, nutrition education, and improved access to healthier foods, effectively reduce sugar consumption and encourage healthier purchasing behaviours. Implementing these interventions in the Maldives could reduce NCD prevalence, lower long-term healthcare expenditure, and strengthen national public health outcomes.

Keywords: *sugar consumption, economic impacts, Maldives*

Hospital-Based Study in Identifying the Determinants for Cesarean Sections and Vaginal Deliveries In IGMH

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Globally, the rate of caesarean sections has been increasing, and it also has become a major concern in the Maldives. A hospital based cross sectional study was conducted in Indira Gandhi Memorial Hospital (IGMH), the major tertiary hospital in the Maldives, to study the rate of caesarean sections and to identify the determinants of modes of deliveries. The objectives of this study are to identify the distribution of the modes of delivery and the maternal and foetal factors determining it. Data was collected through direct interviews, using a self-developed questionnaire, and parametric and non-parrametric tests were used to analyse the data. A total of 394 individuals gave birth within the study duration and census sampling was done, as per the inclusion and exclusion criteria. The results identified that 55.9% of these individuals had cesarean sections; out of which 37.7% were emergency caesarean sections and 18.2% were elective caesarean sections. The rest of the 44.1% had normal vaginal deliveries. The mode of deliveries was significantly associated with maternal age, gravidity, birthweight, fetal presentation, method of conception and history of previous caesarean sections. This is the first known study of its kind conducted in the Maldives, providing valuable insight into these factors within the local population. The findings can help shape future research, guide clinical practice and support the development of evidence-based interventions to improve both maternal and neonatal outcomes

Keywords: *Elective caesarean sections, emergency caesarean sections, vaginal delivery, foetal presentation, method of conception.*

Selective Enrichment of Hydrocarbon-Degrading Bacteria from Mangrove Ecosystem: A Preliminary Study Towards Contaminated Mangrove Restoration

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Mangrove ecosystems are specialised intertidal habitats that provide essential ecological and economic services. Despite these significant contributions, its integrity is increasingly affected by petroleum hydrocarbon contamination arising from anthropogenic activities and accidental spills. Although natural attenuation by the indigenous microbial community has been reported, the slow process has been considered ineffective. As such, developing an efficient and optimised bioremediation system capable of restoring contaminated mangrove habitat becomes necessary. Therefore, this study aimed to selectively enrich cultivable hydrocarbon-degrading bacteria from the mangrove ecosystem as a base for contaminated mangrove restoration. Eighteen environmental samples comprising of water and sediments were collected. The indigenous bacterial communities were cultured in nutrient broth for three days prior to selective enrichment in modified Bushnell-Haas medium supplemented with sterilised 1% (v/v) diesel. Following 7-days incubation, varying colours ranging from deep brown to light green were observed, indicating microbial multiplication. Spectrophotometric results at A600nm revealed a significant difference between sediments (1.58) and water samples (1.03) collected from the same sampling point. Similarly, higher degradation was recorded in sediment samples (22.03%) compared to their water counterparts (16.99%). However, the best degradation was recorded in MW2 (41.08%), while sample MW6 recorded the least degradation (5.06%). Ultimately, the findings indicated the widespread distribution of bacteria capable of utilising or tolerating diesel hydrocarbons in the mangrove despite a lack of data to support diesel contamination from the sampling point. Further, the enrichment procedure establishes a valuable microbial resource for subsequent isolation, characterisation, molecular identification and optimisation for future remediation studies.

Keywords: *Mangrove, Bacteria, Hydrocarbon, Contamination, Degradation*

Extraction and Characterisation of Halal Gelatin from Maldivian Yellowfin Tuna (Thunnus albacares) Backbones

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Gelatin is a vital biopolymer widely utilised in the food, pharmaceutical, cosmetic, and biomedical industries due to its exceptional gelling, emulsifying, and film-forming properties. Traditionally derived from porcine and bovine sources, gelatin production faces increasing scrutiny regarding disease transmission, religious restrictions, and sustainability. Marine-derived gelatin, particularly from fish processing by-products, offers an environmentally friendly, value-added alternative that promotes the utilisation of waste. Among these, fish-derived halal gelatin is gaining prominence, as it fulfils the dietary requirements of Muslim consumers while providing a sustainable source of functional biomaterials. To the best of our knowledge, this study is the first to report extracted halal gelatin from yellowfin tuna (Thunnus albacares) backbones obtained from fish processing waste in the Maldives. AKer initial cleaning, the backbones underwent pulverisation and freeze-drying to optimise sample preparation. Demineralisation was performed using hydrochloric acid (HCl) at concentrations ranging from 0.2 to 0.8 M to effectively remove hydroxyapatite from the bone matrix, followed by thermal extraction. Results demonstrated that all HCl concentra'ons successfully yielded gelatin. Fourier Transform Infrared (FTIR) spectroscopy revealed spectral similarities of 90.00–92.49% between the extracted gelatin and commercial porcine gelatin, confirming the preservation of characteristic functional groups. Texture profile analysis using a TA.XTplusC Texture Analyser indicated that gelatin extracted with HCl retained measurable hardness, springiness, cohesiveness, gumminess, chewiness, and resilience. In conclusion, yellowfin tuna backbones waste from the Maldives serves as a viable, sustainable source of halal gelatin with promising physicochemical properties, supporting its potential application across the food, pharmaceutical, and biomaterial industries.

Keywords: *Yellowfin tuna (Thunnus albacares), Backbones waste, Halal, Marine gelatin, Maldives*

Impact of a Holling Type IV Nonlinear COVID–19 Incidence Rate on HIV–COVID–19 Coinfection Dynamics

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A four-compartment mathematical model of a human population is proposed to investigate the dynamics of HIV–COVID-19 co-infection, incorporating a Holling Type IV functional response to characterize the nonlinear COVID-19 incidence rate. The well-posedness of the model is demonstrated by proving the positivity and boundedness of its solutions. The mono-infection COVID-19, mono-infection HIV, and HIV–COVID-19 coinfection submodels are analysed to explore their respective transmission dynamics. The basic reproduction number is derived for each case. Furthermore, the local and global stability of the disease-free and endemic equilibrium points are rigorously examined using the Jacobian matrix and Lyapunov function methods, respectively. The occurrence of a transcritical bifurcation in the HIV–COVID-19 coinfection model is also investigated. The analytical results are validated through numerical simulations under two distinct scenarios

Keywords: *COVID–19, HIV, Co-infection, Stability analysis, Transcritical bifurcation.*

Emotional Intelligence and Academic Resilience among Maldivian Higher Education Students: Implications for Well-Being and Policy Reform

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Maldives has witnessed rapid growth in higher education; however, rising dropout rates and student mental health concerns highlight the need to move beyond achievement-focused models of student success. Psychological factors influencing students' well-being remains largely under-addressed in institution policies and quality assurance discussions. This study explores the relationship between Emotional Intelligence (EI) and Academic Resilience (AR) among Maldivian Higher Education students, while exploring the role of perceived social support within this under-researched national context. A quantitative correlational design was employed, with a convenience sample of 283 students aged 18–35. Data was collected through an online questionnaire structured using the Schutte Self-Report Emotional Intelligence Test (SSEIT), the Academic Resilience Scale (ARS-30), and the Multidimensional Scale of Perceived Social Support (MSPSS and analysed through correlation and regression analyses. Findings showed moderate EI (M=119, SD=18.5) and AR (M=107.7, SD=18.2). A significant positive correlation existed between EI and AR ($r=.52$, $p<.001$). EI strongly predicted AR ($\beta=.519$, $p<.001$, $R^2=.269$). All EI dimensions were positively associated with academic resilience, with facilitating emotions showing the largest association ($\beta = .54$, $p < .001$). Perceived support from family, friends, and significant others was positively associated with EI; but for AR, family support ($\beta = .34$, $p < .001$) and significant-other support ($\beta = .25$, $p < .001$) were significant, whereas friend support was not ($p = .123$), reflecting family dominance in Maldivian support systems. Findings provide locally grounded evidence that EI and social support may be relevant targets for student-development, well-being, and institutional-support strategies in Maldivian higher Education

Keywords: *Emotional Intelligence, Academic Resilience, Student Well-being, Higher Education, Social Support*

Biosynthetic Blueprint in the Oil-Palm Root Microbiome is Lineage-conserved

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Soil and root-associated microbiomes represent an important but underexplored source of biosynthetic gene clusters (BGCs) with potential relevance to plant health and natural-product discovery. However, it remains unclear whether BGCs in complex microbiomes are mainly strain-variable accessory traits or conserved features of microbial lineages. This study aimed to catalogue BGC diversity in the oil-palm root-associated microbiome and determine whether biosynthetic potential is enriched in core or accessory pangenome fractions. A total of 633 metagenome-assembled genomes (MAGs) were recovered from 30 bulk soil, rhizosphere and endosphere metagenomes collected from healthy and Ganoderma boninense-affected oil-palm systems. BGCs were predicted using antiSMASH, clustered into gene cluster families, and compared with MIBiG references. A coordinate crosswalk between antiSMASH regions and Anvi'o pangenome gene clusters was applied to 87 focal MAGs to test BGC-associated gene occupancy. Phylogenetic signal and ancestral reconstruction were used to assess lineage-level structure. No human or animal subjects were involved. antiSMASH identified 3,532 BGC regions in 578 MAGs, forming 2,692 gene cluster families with no network-level match to characterized MIBiG references. BGC-associated clusters showed significantly higher pangenome occupancy than genome-wide background in three of four focal lineages, supported by a genome-aware mixed model. BGC richness also showed strong phylogenetic signal, with Myxococcota displaying deep ancestral enrichment. These findings suggest that biosynthetic potential in the oil-palm root microbiome is largely lineage-conserved rather than predominantly strain-accessory, supporting phylogenetically informed prioritization for future natural-product discovery.

Keywords: *Metagenome-assembled genome, Biosynthetic gene cluster, Oil palm root microbiome, Phylogenetic signal, Pan-genome*

Tracing Glycerol Origins in Cosmetics Using FTIR Spectroscopy and Machine Learning for Halal Traceability

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Glycerin (glycerol) is widely used in cosmetic formulations and may be derived from plant, animal, or synthetic sources, creating halal-related provenance concerns among consumers with specific religious, dietary, or health-related requirements. This proof-of-concept study investigated Fourier transform infrared attenuated total reflectance (FTIR-ATR) spectroscopy combined with machine learning (ML) to differentiate glycerol according to origin. Oils and fats were extracted from five animal sources (beef, chicken, sheep, fish, and pig) and five plant sources (coconut, sunflower, peanut, palm, and soybean), followed by transesterification, purification, and GC-MS assessment of residual contaminants. For eight origins, glycerol was independently produced in triplicate and analysed in technical triplicate; palm and soybean glycerol were produced in duplicate and analysed in technical triplicate, yielding 28 biological preparations and 84 FTIR spectra. Six spectra were reserved as an independent external test set, while the remaining 78 were used for PCA, feature selection, model development, and internal validation. PCA identified 174 discriminative bands within 663–674, 1504–1562, 2325–2361, and 3648–3713 cm^{-1}, which were further reduced to 44 bands using discriminant analysis. Hierarchical cluster analysis clearly separated porcine-derived glycerol, although some animal-derived glycerol (AG) and plant-derived glycerol (PG) samples overlapped. DA and support vector machine achieved accuracies of 98.48% and up to 100%, respectively, compared with 92.30% for random forest and 76.67% for naive Bayes. The models were also applied exploratorily to glycerol isolated from four commercial lotion and moisturizer brands. Overall, FTIR-ATR–ML shows potential for preliminary AG and PG screening, pending larger externally validated studies.

Keywords: *Glycerol origin, FTIR spectroscopy, Model performance, Machine learning, Cosmetics*

Baseline Assessment of Selected Modifiable Cancer Risk Factors in the Maldives: Evidence from a Nationwide Screening Program (2014–2025)

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Regular cancer risk factor surveillance is critical for prevention planning, policy development, and timely public health interventions. National screening programs presents an opportune platform for surveillance efforts to identify population risk profiles. This study aimed to assess the prevalence and distribution of key selected modifiable cancer risk factors identified through a national screening program conducted by the Cancer Society of Maldives. A retrospective cross-sectional study was undertaken using secondary data from individuals who participated in screening programs across 20 atolls between 2014 and 2026. Structured risk assessment tools collected data on demographic characteristics and lifestyle behaviours, including areca nut chewing, supari use, smoking, smokeless tobacco use, and vaping. Descriptive statistics were used to summarize the prevalence and distribution of risk factors across age groups. A total of 18,007 participants were included. Areca nut chewing was the most prevalent risk factor (52.4%), followed by supari use (25.7%), smoking (12.6%), smokeless tobacco use (8.5%), and vaping (0.8%). Areca nut chewing was seen predominantly in participants aged over 60 years (55.4%). Supari use was highest among participants aged under 35 years (43.3%), indicating early exposure to established cancer risk factors. Smoking (21.5%) and smokeless tobacco use (17.2%) were most prevalent among participants aged 35–60 years, while vaping remained uncommon across all age groups (0.8%). These findings will be useful for tailoring prevention and health promotion programs for age specific needs. Integrating risk factor surveillance systems will help inform ongoing cancer prevention efforts and the development of evidence-based national cancer control policies.

Keywords: *Cancer Risk Surveillance, Cancer prevention, National Screening Program, Modifiable Risk Factors, Maldive*

Sub-theme 4: Global Governance, Peace, and Development

10 Abstracts



Conflict Transformation in Practice: A Study in the Chittagong Hill Tracts of Bangladesh

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The Chittagong Hill Tracts (CHT), located in the Southeastern part of Bangladesh, have been engulfed by ethnic conflict between tribal people and government security forces since the late 1970s, due to the demand of the tribal people for constitutional recognition and protection of traditional lands and autonomy, as well as their opposition to attempts to assimilate them with the majority Bengali culture. To end the conflict, an Accord, known as the CHT Accord, was signed between the Government of Bangladesh and Santu Larma, the leader of Prbattattya Chattagram Jana Sanghati Samity (PCJSS), on 2nd December 1997, formally ending more than two decades of violent conflict in the region. This study aims to explore the conflict transformation practices in the context of the Chittagong Hill Tracts of Bangladesh. The study applies a qualitaitves approach, where semi-structured interviews were conducted in CHT along with documentary analysis. The findings of the study shows that the conflict transformation approach in CHT has largely failed due to the failure of the government as well as international donors to address the underlying causes of the conflict. The study finds that the transformation approach applied by the government, instead of addressing the conflict has created local grievances and new types of conflict. The study recommends that local needs and priorities need to be addressed to transform the conflict and achieve durable peace in CHT.

Keywords: *Conflict, Transformation, Approaches of Conflict Transformation, Dimensions of conflict Transformation, Chittagong Hill Tracts (CHT)*

Comparison of Titanium-Zirconium and Titanium Implants under Immediate Posterior Mandibular Loading

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This study evaluated and compared the clinical performance of titanium-zirconium (Ti-Zr) and titanium (Ti) dental implants subjected to immediate functional loading in the posterior mandibular region, where occlusal forces are greater. A total of 40 participants meeting the inclusion criteria were randomly divided into two groups: 20 received Ti-Zr implants and 20 received Ti implants. Implant placement was performed using a standard full-thickness mucoperiosteal flap approach, followed by immediate loading according to the principles of implant-protective occlusion. Clinical parameters, including crestal bone loss (CBL), modified plaque index (MPI), probing depth (PD), and modified sulcular bleeding index (MSBI), were assessed at baseline and after 4, 8, and 12 months. Intergroup comparison showed slightly higher CBL in the Ti-Zr group at 4 months, while lower values were observed at 8 and 12 months compared to the Ti group; however, these differences were not statistically significant ($P > 0.05$). Similarly, no statistically significant differences were found in MPI, PD, or MSBI between the groups at any follow-up interval. Within the limitations of the study, Ti-Zr implants demonstrated clinical and periodontal outcomes comparable to Ti implants under immediate loading conditions in the posterior mandible. Further long-term studies are recommended to assess their durability and cost-effectiveness.

Keywords: *Dental implant, Immediate loading, Crestal bone loss, Periodontal parameters, Standard flap approach*

From Drafting to Implementation: Governance Lessons from The Maldives

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Legal reform is often treated as the endpoint of governance change, where the enactment of legislation is assumed to reflect successful reform. In practice, however, the passage of a law does not necessarily produce effective outcomes, particularly in small-state and developing contexts such as the Maldives. Existing discussions frequently explain this gap through implementation failures, focusing on institutional capacity, coordination, and enforcement challenges. Less attention has been given to how governance gaps emerging before and during enactment contribute to these outcomes. This paper examines how governance gaps across the legislative reform cycle shape legal outcomes in the Maldives. It adopts a qualitative thematic policy analysis drawing on selected legislative reform and implementation experiences across governance, social policy, public health, and regulatory sectors. The analysis uses legislative processes, implementation practices, and publicly available governance materials to identify recurring patterns across pre-enactment, enactment, and post-enactment stages of reform. The findings identify recurring governance gaps across the reform cycle. At the pre-enactment stage, reforms are often developed without sufficient policy grounding, evidence, or stakeholder consultation. During enactment, limited legislative scrutiny, political pressures, and time constraints reduce opportunities for substantive review. At the post-enactment stage, implementation challenges emerge through unclear institutional mandates, weak coordination, delayed regulations, and limited accountability systems. The analysis further suggests that implementation failures are often cumulative, with weaknesses at earlier stages shaping outcomes at later stages.

Keywords: *Legal Reform, Governance, Policy Implementation, Law-making, Small-States*

Anti-Corruption Enforcement in the Maldives Examining the Rationale for Granting Prosecutorial Authority to the Anti-Corruption Commission of Maldives

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In the fight against corruption, the Maldives has worked towards institutional reform for over fifteen years, yet significant enforcement challenges remain. The country scored 39 out of 100 on the Corruption Perceptions Index in 2025, ranking 91st among 182 countries (Transparency International, 2025). Although the Anti-Corruption Commission (ACC) was established under Article 199 of the Constitution (2008) and the Anti-Corruption Commission Act (Act No. 13/2008), prosecutorial authority remains with the Prosecutor General's Office (PGO). In 2024, only 11 of 1,171 cases proceeded to prosecution while three were returned without charges (Anti-Corruption Commission of the Maldives, 2024). While previous studies examined anti-corruption institutional design (OECD, 2008) and enforcement failures in Asia (Quah, 2021), no empirical study has assessed stakeholder support for granting prosecutorial authority to the ACC of the Maldives, a gap this study addresses. Guided by principal-agent theory (Jensen & Meckling, 1976), this mixed-methods study examined whether the current arrangement limits accountability, with objectives to assess stakeholder support, examine public trust, and analyse the role of political barriers. A structured survey of 132 participants was complemented by open-ended questions. Data were analysed using descriptive statistics, reliability analysis, Pearson's correlation, multiple linear regression, and thematic analysis (Braun & Clarke, 2006). Findings revealed moderate support for reform, with political factors emerging as the strongest predictor ($\beta = .666$, $p < .001$) and 72.8% identifying political barriers as the main obstacle. Qualitative findings highlighted political interference and prosecutorial delays. The study provides empirical evidence to inform reforms on anti-corruption enforcement and prosecutorial independence in the Maldives.

Keywords: ***Anti-Corruption Commission (ACC), Prosecutor General's Office (PGO), Corruption, Anti-corruption reform, Prosecution powers***

Judicial Capping of Back Pay in Unfair Dismissal Cases under Maldivian Employment Law: An Analysis of Supreme Court and High Court Jurisprudence

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Since the enactment of the Employment Act (Act No. 2/2008), employees in the Maldives have been protected against unfair dismissal through remedies including reinstatement and back pay. Traditionally, reinstated employees received back pay for the entire period between dismissal and reinstatement; however, recent Supreme Court decisions appear to have introduced limitations on such awards, creating uncertainty regarding the extent of backpay entitlements. Clarifying this issue is important for ensuring fairness and predictability in employment law. There is uncertainty as to whether backpay awarded following reinstatement is subject to a statutory or judicial cap and, if so, its duration and scope. Hence, this research seeks to determine whether such back pay is subject to any legal cap and, if so, to identify its duration and scope. The main research questions are whether employees reinstated after unfair dismissal are entitled to back pay, whether such back pay is subject to any statutory or judicial limitation, and the maximum period of entitlement where such a limitation exists. This study adopts a qualitative doctrinal legal research methodology, examining provisions of Maldivian employment law and analysing judgments of the High Court and Supreme Court on reinstatement and back pay, relying on legislation, case law, academic literature, and International Labour Organization materials. The study is expected to find that reinstatement remains an available remedy for unfair dismissal, but recent Supreme Court decisions may limit the period of back pay awarded, and it will clarify whether such limitations amount to a statutory or judicial cap and define their scope, thereby providing guidance for courts, employers, employees and supporting possible legal reform.

Keywords: *Employment Act, Unfair Dismissal, Judicial Capping, Back pay, Reinstatement*

The Labour Relations Authority as A Wage Recovery Mechanism for Migrant Workers in The Maldives

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The Maldives employs a substantial migrant workforce essential to tourism and construction sectors, yet these workers remain vulnerable to systematic wage theft despite existing legal frameworks. This study investigates four interconnected research questions: which forms of wage theft are most frequently brought before the Labour Relations. Authority by migrant workers; what legal protections the Employment Act 2008 and regulations offer migrant workers against wage theft; what instutional barriers prevent migrant workers from effectively accessing the Labour Relations Authority as a wage recovery mechanism; and what legal and institutional reforms are necessary to strengthen migrant worker wage protection. The research employs mixed-methods analysis combining doctrinal legal analysis with semi-structured interviews conducted with key informants: Labour Relations Authority representatives, Legal practioners & NGOs, and migrant workers. Doctrinal analysis examines the Employment Act 2008, relevant regulations, constitutional provisions, and Maldives' obligations under ILO Conventions No. 95 and No. 143. Interview data explores instutional enforcement practices, regulatory challenges, and barriers to worker access. Preliminary findings indicate that wage non-payment and underpayment constitute the predominant forms of wage theft reported to the Labour Relations Authority. While the Employment Act contains formal prohibitions against wage theft, implementation gaps significantly undermine protection. Institutional barriers include inadequate inspection capacity, inaccessible complaint procedures, language obstacles, and insufficient penalty deterrence. The study identifies that meaningful reform requires extending minimum wage protections to all workers regardless of nationality, strengthening Labour Relations Authority investigative powers with enhanced penal-es, and establishing multilingual, accessible complaint mechanisms. These reforms are essential to align domestic practice with international labour standards and ensure genuine protection for migrant workers against wage theft

Keywords: *Migrant Workers, Wage theft, International Labour Organizaton (ILO), Labour relations authority (LRA), Employment*

Authoritarianism and the Complicity of The Donors: Bangladesh's Experiences

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This paper seeks to dissect Bangladesh's aid relations and its realpolitik to understand how aid donors contribute to authoritarian rule in the recipient country to ensure their varied interests. Bangladesh experienced a long period of authoritarian rule from 2009 to 2024, and the regime used foreign loans as a key instrument to implement its development agenda. While the election system was completely fractured during the regime, the government focused on a development-led legitimacy and relied on various donors for loans. Despite the abysmal track record of human rights violations, rampant vote rigging, and desperate corruption, the donors preferred to look the other way, allowing the government to continue its misrule for their own interests. Bangladesh's experience underscores how donors can be complicit in democratic backsliding and offers lessons for countries of the Global South as they partner with donors. The study will employ a qualitative analysis and use the following methods for data collection: document surveys, in-depth interviews, and observations. The author, as a pracademic, has a longstanding privilege to note donor behaviours in aid management and negotiations, and the key takeaways from these observations will significantly complement the analysis and arguments. The study's analysis and findings will enrich the aid literature by offering new insights into development partnerships and authoritarianism. More importantly, the assumed correlation between rampant foreign aid and democratic backsliding will lead policymakers and researchers to question the integrity of foreign aid and its role in development.

Keywords: *Foreign aid, Authoritarianism, Bangladesh, Election rigging, Human rights violations*

Patronage in Practice: State-Owned Enterprises as Instruments of Political Employment in the Maldives

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Archive.mv

State-owned enterprises (SOEs) in the Maldives have long been discussed as vehicles for political patronage a reality widely acknowledged in public discourse but never backed by systematic evidence. This paper changes that. Using monthly pension enrolment and termination records from the Maldives Pension Administration Office (MPAO) covering 41 SOEs from the office's establishment through April 2026, this paper provides the first quantitative account of how political cycles shape public enterprise employment in the Maldives. The dataset tracks new hires, terminations, and net workforce changes across five presidential administrations and four democratic transitions. Analysing these trends by election period, sector, and individual enterprise, we show that hiring and firing patterns align far more closely with electoral cycles than with any operational logic. Workforce expansions cluster in the early months of incoming administrations; termination spikes mark the end of outgoing ones. The effect is consistent across the dataset but most pronounced in politically exposed enterprises particularly in utilities, construction, and public services. The evidence presented makes clear that SOE employment in the Maldives is not governed by performance or need it is governed by politics. Without structural reform to insulate public enterprises from electoral cycles, SOEs will continue to serve as patronage instruments at the expense of institutional effectiveness and public accountability. The findings make the case that governance reform is not optional but urgent.

Keywords: *State owned enterprises, Political patronage, Electoral Cycles, Public sector employment, Governance Reform*

The Influence of Need for Material Resources and Need for Arousal on Borrowing Behaviour and Financial Well-Being among Civil Servants in the Maldives

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This study examines the role of motivational traits, specifically Need for Material Resources and Need for Arousal, in shaping borrowing behaviour and financial well-being of civil servants in the Maldives. A cross-sectional survey design was adopted, and data was collected through a structured questionnaire administered to 382 civil servants. Covariance-based structural equation modelling is used to test relationships amongst motivational traits, borrowing behaviour and financial well-being based on the conceptual framework. The results show that higher level of material needs and need for arousal significantly increase an individual's propensity to borrow. Individuals with higher Need for Material Resources engage in borrowing for satisfying needs and people who seek for arousal are more willing to undertake borrowing activities. Moreover, borrowing behaviour significantly influences financial well-being, such that increasing borrowing activity leads to reduced level of financial well-being. This study reveals that motivational traits shape financial well-being primarily through borrowing behaviour, highlighting that borrowing behavior serves as a key behavioural pathway linking motivational dispositions to individuals' financial well-being. The reliance on cross-sectional research design as well as self-reported measures has limitations for inferring causality and generalizability. Further, future research may examine the long-run effect of motivation on the individual's financial behaviour using a longitudinal design. This study contribution to the behavioural finance literature by analysing the indirect pathways of motivation's impact on financial well-being. Practically, the findings suggest that financial literacy programmes and workplace financial wellness initiatives should incorporate psychological and motivational factors to encourage responsible borrowing and enhance employees' financial well-being.

Keywords: *Need for Material Resources, Need for Arousal, Borrowing Behaviour, Financial Well-Being, Civil Servants*

Xenophobic Stereotyping in Maldivian Online Media: A Content Analysis of Migrant Worker Coverage

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Xenophobia toward migrant workers in the Maldives has been described as extreme, yet no empirical study has examined whether this prejudice is reflected in mainstream news media. This study addresses that gap by investigating the presence and extent of xenophobic stereotyping in three major Maldivian online news outlets, Sun Online, Mihaaru, and Vaguthu Online over the period January 2022 to December 2025. This timeframe was selected to capture a period of significant socio-political change, including the introduction of new labour protection legislation in 2022, large-scale migration events in 2023 when over 62,000 foreign workers entered the country, the government's mass deportation programme Operation Kurangi in 2024, and the UN Committee on the Elimination of Racial Discrimination's review of the Maldives in 2025. The study adopts a positivist paradigm and employs a mixed-method design combining qualitative content analysis of news articles with semi-structured interviews with journalists and senior editors. Purposive sampling is used to select articles relating to migrant workers published across the study period. Data are coded and analysed thematically to identify framing patterns, stereotypical language, and editorial attitudes toward foreign workers. Preliminary findings suggest that xenophobic tropes including criminalization, othering, and threat framing appear consistently across the selected outlets. The study contributes the first systematic empirical analysis of xenophobia in Maldivian media and offers evidence-based recommendations for human rights-informed journalism practice, media literacy policy, and migrant worker protection frameworks in the Maldives.

Keywords: *xenophobia; media framing; migrant workers; Maldives; content analysis*

Professional Perspectives as a Pathway to Change: A Thematic Study of the Maldivian Juvenile Justice System

Fathimath Naseer

The Maldivian juvenile justice system established significant reforms with the enactment of the Juvenile Justice Act in 2019, adopting a restorative justice framework towards rehabilitating young people in conflict with the law. However, the transition from policy to practice faces significant obstacles due to resource constraints and limited research on youth offending in the Maldives. This study utilised an inductive qualitative approach, with semi-structured interviews to facilitate in-depth exploration of participants' views. Ten (10) participants who work in the juvenile justice system were selected using purposive sampling. The semi-structured interview schedule was developed to explore areas related to the perceptions towards offending and rehabilitation among children in conflict with the law in the Maldives. Participant data was analysed using Reflexive Thematic Analysis, which revealed that systemic inconsistencies, societal stigma and fragmented institutional practices collectively undermined the delivery of justice for children in conflict with the law. This research offers valuable insights into the experiences of professionals in the Maldives' juvenile justice systems and identified gaps in implementation. The findings of this study offer exploration towards identifying areas for further research to support policy reform in the Maldives.

Keywords: *Juvenile Justice, Restorative justice, Reflexive thematic analysis, Professional perspectives, Policy reform*

Understanding Attitudes Towards Body-Worn Cameras and Their Association with Behavioural Outcomes: A Study of Public and Police Perspectives in the Greater Malé Region

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The adoption of body-worn cameras (BWCs) has become an important policing reform worldwide, aimed at enhancing police accountability, improving transparency, strengthening public trust, and protecting both police officers and civilians during police-public interactions. The Maldives introduced BWCs in 2023; however, empirical evidence on public and police perceptions of this technology remains limited. This study examines the attitudes of both the public and police towards BWCs and explores the association between these attitudes and selected behavioural outcomes. A quantitative cross-sectional survey design was employed using a structured questionnaire comprising attitude and behavioural constructs measured on a five-point Likert scale. Data were collected from 183 members of the public and 50 police officers in the Greater Malé Region. Descriptive statistics and regression analysis were conducted using SPSS to analyse the data. The findings indicate that both the public and police hold generally positive attitudes towards the use of BWCs. Furthermore, positive attitudes were significantly associated with favourable behavioural outcomes, including improved police-public interactions, reduced use of force, enhanced accountability, and fewer complaints against both police officers and members of the public. These findings suggest that positive perceptions may support the effective implementation of BWCs in policing and contribute to strengthening transparency and public confidence in law enforcement in the Maldives.

Keywords: *Attitude, Body worn cameras, Greater Male', Police and public*.

Book Review: "Small States Maritime Security: The Indo-Pacific Strategy for Maldives" by Dr. Athaulla A Rasheed

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The mainstream security discourse in geopolitics and international relations often sidelines the small states' security question, while predominantly focussing on military power, warfare strategies, and the great power competition. But, the adrift global order of the twenty-first century has put the global spotlight on the maritime domain, which has repositioned island countries at the centre of the great debates due to their strategic location astride the key maritime trade routes. To this end, the meticulously researched work, Small States Maritime Security: The Indo-Pacific Strategy of Maldives by Dr Athaulla A. Rasheed is a welcome contribution to the emerging literature on small states' security. Building on his knowledge and specialisation in the field of security studies, the volume offers a comprehensive blend of both a theoretical dimension in consonance with the contemporary security challenges faced by Maldives. Additionally, the thought-provoking work by Dr Rasheed also addresses the most compelling issue for Maldives, where it is emerging as a security question between the dynamics of resident, proximate and distant powers present in the Indian Ocean Region.

Keyword: *book review, maritime security, Indo-Pacific Strategy, Maldives*

Sub-theme 5: Education, Knowledge and Future of Work

64 Abstracts



Emergent Grand Challenge in Engineering Education: Preparing Engineers for an AI-Driven, Cyber-Resilient Future

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The COVID-19 pandemic accelerated a sweeping digital transformation across all sectors, exposing both opportunities and vulnerabilities in engineering education. At the intersection of artificial intelligence (AI), cybersecurity, and the Internet of Things (IoT), a new grand challenge emerges preparing engineers to thrive in an AI driven, data rich world while safeguarding digital infrastructure and upholding ethical standards. This paper revisits the fourteen educational imperatives outlined at the 2014 Doha Engineering Leaders Conference, reinterpreting them considering contemporary technological and societal shifts. The study argues that future ready engineering education must embrace adaptive, interdisciplinary curricula that integrate AI literacy, data science, and cybersecurity principles with strong ethical frameworks. Learner centred pedagogies such as project based and collaborative approaches are highlighted as essential for cultivating resilience, creativity, and global competence. Equity and inclusivity are emphasised, particularly in African contexts where digital divides persist, requiring innovative strategies that embed indigenous knowledge systems alongside modern technologies. Strategic recommendations call for strengthened partnerships among academia, industry, and policymakers to align education with sustainable development goals and the demands of the Fourth Industrial Revolution. By fostering innovation, ethical leadership, and socio technical resilience, engineering education can evolve to empower the next generation of engineers to design secure, sustainable, and equitable solutions. Ultimately, this transformation is not only an academic necessity but a societal imperative for shaping a cyber resilient and inclusive future.

Keywords: *Artificial Intelligence, Sustainability, Cybersecurity, Engineering Education, ICT and E-Learning*

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The appeal for inclusive education is increasing globally, yet small island developing states (SIDS) face distinctive challenges in implementation due to geographic dispersion, resource inequities, and limited access to specialist support. In the Maldives, English language classrooms often comprise diverse learners, but systemic constraints hinder teachers' ability to enact inclusive pedagogy. This study explores structural and contextual barriers to inclusive education in rural schools of Maldives from a practitioner perspective. A qualitative method was employed, using semi-structured interviews with ten English teachers from rural schools. Reflexive thematic analysis guided coding and theme development. Teachers consistently identified large class sizes, limited instructional time, inadequate resources, and geographic isolation as barriers. These constraints mirror international findings but are intensified in rural contexts where resource distribution and professional development opportunities are uneven. Community attitudes, including parental resistance, further complicate implementation. The findings highlight that while teachers demonstrate strong commitment to inclusion, their practices are often improvised and constrained by systemic factors. Strengthening inclusive education in the Maldives requires systemic investment in equitable resource distribution, practice-based professional development, and community awareness initiatives. For policy audiences, the study underscores the need to embed inclusive pedagogy within curriculum reform and align national strategies with SDG 4. By foregrounding teacher voices, this research contributes to regional discourse on equity in small island education systems.

Keywords: *Inclusive Education, Maldives, Small island developing states, Systemic barriers, Teacher voice*

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The Significance and Challenges of Incorporating ICT in Secondary English Language Learning Classrooms: A systematic literature review

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Information and Communication Technology (ICT) has become an essential component of 21st-century language teaching. This systematic literature review (SLR) aims to explore the significance of ICT in language learning, its effectiveness in secondary classrooms, and the challenges associated with its implementation. Twenty-one research articles were selected from prominent databases such as JSTOR and ERIC with indexed journals uploaded to ResearchGate. Keywords were searched utilizing Boolean operators. Articles selected were peer-reviewed English articles published between 2015-2026. Others were excluded. These articles were analysed thematically to address the research questions. The findings indicate that ICT is a valuable tool for enhancing language skills. It was effective in boosting student motivation and promoting self-autonomy in learning. ICT provides interactive platforms that cater to various learning styles, making language acquisition accessible and enjoyable for students. However, the integration of ICT in language teaching is not without its challenges. One significant barrier is the digital illiteracy among teachers, which hampers their ability to effectively utilize technology in their teaching practices. Lack of resources, such as inadequate access to technology and internet connectivity, poses a significant obstacle. Furthermore, some teachers lack the confidence to incorporate ICT into their curriculum, often due to insufficient training and support. This SLR aims to underscore the importance of addressing these challenges to fully leverage the benefits of ICT in language education. The insights provided can assist policymakers in devising strategies to implement ICT more effectively in secondary schools, ensuring that full potential of ICT in language learning can be harnessed.

Keywords: *Information and Communication Technology (ICT), Language Learning, Secondary Education, Student motivation, Digital literacy*

PACeD Framework: A Pedagogically Grounded Approach to Enhancing Learning Outcomes Through Personalized Adaptive e-Learning in Resource-Constrained Higher Education

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The Personalised Adaptive Content for eLearning Development (PACeD) Framework was developed as a pedagogically grounded approach to address the persistent challenge of implementing effective personalized adaptive e-learning in resource-constrained higher education contexts. The framework integrates constructively aligned learning objects, dynamic learner profiling, adaptive learning pathways, and tiered assessment strategies within existing Learning Management Systems. This study evaluates the effectiveness of the PACeD framework in enhancing students' academic achievement, as measured through pre-test and post-test performance comparison. A quasi-experimental one-group pre-test/post-test design was employed within the evaluation phase of a Design and Development Research (DDR) approach. The PACeD framework was implemented within a Moodle-based personalized adaptive e-learning environment in an undergraduate nursing module at The Maldives National University (N=50). Pre-test and post-test scores were analysed using paired-samples t-tests, with effect sizes calculated to determine practical significance. Pre-test scores (M=53.78, SD=9.99) and post-test scores (M=76.72, SD=8.19) demonstrated a statistically significant improvement in academic performance ($t(49)=-13.15$, $p<.001$). The mean difference of 22.94 percentage points represents substantial learning gains. Cohen's $d=2.58$ indicates a very large effect size. The distribution of scores shifted markedly: 60% of learners scored below 60% on the pre-test, while only 4% remained in this category post-test. Conversely, 70% achieved "Good" or "Excellent" scores post-test compared to only 14% pre-test. The PACeD framework demonstrates significant effectiveness in enhancing academic achievement in resource-constrained higher education settings. The large effect size and substantial learning gains provide empirical validation for the framework's pedagogically grounded approach to personalized adaptive e-learning. The findings contribute to the growing body of evidence supporting adaptive learning as a viable strategy for improving educational outcomes in developing country contexts.

Keywords: *adaptive learning, learner satisfaction, PACeD framework, personalized e-learning, resource-constrained higher education*

Who Pays the Piper: State Funding and Editorial Change in the Maldivian Press

Ahmed Afrah Ismail
Archive.mv

Press freedom in small island states is structurally vulnerable. Thin advertising markets, concentrated ownership, and state dependency create conditions where public funding can shape what news organisations publish and how. This study examines 41 Maldivian media organisations that received state funding, testing whether that funding correlates with measurable shifts in editorial behaviour. It begins by identifying which of the 41 operate as digital news publishers, then compares each outlet across two twelve-month windows: the year before funding was received and the year after. This comparison tracks changes in publication frequency, topic distribution, and output volume. A second analytical layer applies textual similarity analysis to coverage of five major national news events, testing whether outlets converged in framing or language after funding and whether individual outlets diverged from their own pre-funding coverage of comparable events. All data is drawn from a structured digital archive of Maldivian online media. The study makes no prior assumption that funding produces editorial capture. Change, or its absence, is treated as an empirical question answerable through publication records and computational text analysis. The findings will contribute to a thin body of literature on media independence in small state contexts and produce a replicable framework for examining state-media financial relationships through archival methods.

Keywords: *State Media Funding, Editorial Independence, Digital Media Archiving, Content Analysis, Media Monitoring*

Improving Online ESL Instruction using Technology

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This paper is from observational qualitative research to identify areas for technology improvement from the observation of five ELL teachers who were teaching English to non-native speakers through synchronous online instruction over a 20-week period by an instructional technologist who was a distance learning professional. The study was undertaken at the request of the school leadership to identify areas that could be improved without changing the existing LMS. While many educators have successfully transitioned to online formats, observations of online ELL classrooms over twenty weeks revealed that technology usage often remained minimal, relying heavily on standard video conferencing and basic document sharing. Building upon the teachers' technology experience with their video conferencing (using Zoom) and file sharing, with the goal of enhancing the effectiveness of online teaching, through practical, low-cost strategies to improve interactivity and accessibility. These suggestions range across six specific areas: computer adjustments (such as mouse settings and magnification for accessibility), advanced PowerPoint techniques (interactive tools), utilizing MS Word features like "Read Aloud," incorporating online tools, optimizing voice interactions (voice recording and listening), and leveraging Zoom adaptations (communication cards). The suggestions were then evaluated by the administrators and incorporated into professional development for the school's teachers. By moving beyond simple content delivery and adopting these targeted technological strategies, instructors can foster a more engaging, interactive, and effective learning environment for ESL students. The findings emphasize that while online teaching requires a different pedagogical approach than in-person instruction, minor, intentional adjustments should improve the teaching and learning experience.

Keywords: *Online learning, ELL (English Language Learning), Instructional technology, Active learning*

Student-Centered Resourcing: Developing Open Source while Integrating UDL/AT

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In this paper, we are proposing that university teacher education, mathematics, and science faculty work with local teachers to develop open-source educational materials that are culturally relevant and locally specific to the Maldives and incorporate Universal Design for Learning (UDL) and Assistive Technology (AT) principles. The method of implementation for this project follows a collaborative curriculum development model using a design-based research cycle that uses a design-based research cycle into the model: Observe→Design→Implement→Evaluate →Revise→Share. The university provides research, writing experience, and instructional design expertise, while classroom teachers and regional persons contribute local knowledge, classroom-tested activities, and examples that make learning more concrete by creating regional and culturally relevant examples and do so in a way that follows UDL principles and is accessible through AT. From interviews and experiences, problems within the Maldives schools include a lack of teachers who integrate local context, culture, and concrete examples of science and mathematics; Teachers consistently report a lack of resources and a lack of trained teachers; There's a disconnect between the textbook they have and the real-world experiences of students and teachers; Currently, throughout the Maldives, there is very little AT and ULD incorporation in the subject areas. By creating and sharing open-source resources, teachers can bridge the gap between the abstract world of textbooks and the real-world experiences of their students. We are proposing a model to go beyond the textbook and incorporate the local environment and culture into our science and mathematics, making the learning more meaningful and accessible to students.

Keywords: *Open-Source, Universal Design for Learning (UDL), Assistive Technology (AT), Culturally Relevant Pedagogy, STEM Education*

From Information Literacy to AI Literacy: Rethinking Higher Education in the Age of Generative AI in Small Island Developing States

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Generative artificial intelligence (GenAI) is rapidly transforming how knowledge is produced, accessed, evaluated, and communicated within higher education. Tools such as ChatGPT increasingly mediate academic reading, writing, research, and information seeking practices, challenging traditional understandings of information literacy that were developed for predominantly human-authored information environments. While growing attention has been given to AI literacy, much of the existing scholarship and many emerging frameworks originate from technologically advanced and resource-rich contexts, with limited consideration of the distinctive realities of Small Island Developing States (SIDS). This conceptual review examines the transition from information literacy to AI literacy in higher education, with particular attention to SIDS contexts such as the Maldives. Drawing on and synthesizing scholarship from information literacy, digital literacy, critical pedagogy, media literacy, and artificial intelligence in education (AIED), the paper explores how generative AI is reshaping understandings of authorship, credibility, knowledge production, and critical evaluation. It further examines challenges relating to misinformation, algorithmic bias, ethical AI use, technological dependency, and digital sovereignty. The paper argues that AI literacy should be understood as more than a technical competency and that AI literacy frameworks developed elsewhere cannot simply be transferred into SIDS higher education contexts without adaptation. As its primary contribution, the paper proposes a Human Centered AI Literacy Framework for SIDS higher education comprising six interconnected dimensions: critical evaluation, ethical engagement, algorithmic awareness, human judgment, contextual relevance, and digital sovereignty. The framework offers a contextually responsive approach for curriculum development, policy formation, and educational practice, supporting more equitable, ethical, and sustainable AI integration within higher education.

Keywords*: adaptive learning, learner satisfaction, PACeD framework, personalized e-learning,resource-constrained higher education*

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Human at the Centre: Reframing the Future of Work Conversation

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The Future of Work conversation has undergone a significant shift in recent years, moving beyond a predominantly technology-driven understanding of workplace transformation toward a more human-centred perspective. While digitalization, automation, and flexible work arrangements continue to shape organizational practices, the Covid-19 pandemic renewed attention to the human foundations of work and compelled organizations to reconsider assumptions related to employee wellbeing, flexibility, resilience, purpose, and the meaning of work. In order to explore the phenomenon further, we conducted a panel discussion followed by interviews with senior HR officers to understand how work-related practices, behaviours, and assumptions are changing. Our analysis revealed five themes: digital acceleration, work-from-home ambivalence, work humanization, resilience realization, and work reprioritization. These themes capture the changing nature of Future of Work conversations and highlight the growing importance of human-centred organizational thinking. Based on these findings, the study offers practical implications for organizations seeking to remain relevant in a changing work environment and argues that future-ready organizations must move beyond technological adaptation alone to create humane workplaces.

Keywords: *adaptive learning, learner satisfaction, PACeD framework, personalized e-learning, resource-constrained higher education*

Dialogic Pedagogy for ESDGC in Maldivian Primary Schools: Teacher Agency and Curriculum Co-construction in the 'Our Earth Our Futures' Project

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Education for Sustainable Development and Global Citizenship (ESDGC) is essential in contemporary education, and its success depends on pedagogical approaches that move beyond transmission-based models toward dialogic, participatory learning. This paper reports on the Our Earth Our Futures (OEOF) project, an intercultural collaboration between primary schools in the Maldives and the UK, which positions dialogue as the central pedagogical mechanism for meaning making and knowledge co-construction around ESDGC. Drawing on teacher research methods informed by ethnographic methodology, the study explores how dialogic pedagogies enable the integration of ESDGC through arts-based and nature-based collaborative inquiry. Findings demonstrate that dialogue operates across three interconnected dimensions. First, multimodal dialogic engagement enabled talk to be extended through artistic expression functioning as a "second language", thereby enabling students to collaboratively explore and communicate complex environmental issues while fostering inclusive participation. Second, intercultural dialogue, facilitated through digital exchange, transforms local contexts into shared sites of global inquiry, shifting learning from individual knowledge acquisition toward relational, collective understanding grounded in "learning with and for others." Third, dialogic spaces among teachers, characterized by trust, reflexivity, and non-judgmental facilitation, support the co-construction of curriculum, enabling educators to critically examine assumptions and align ESDGC principles with formal educational frameworks. The OEOF project highlights that dialogic pedagogy is not simply a method but a relational and epistemic stance essential for ESDGC. By foregrounding dialogue as the driver of interdisciplinary learning, the project demonstrates how primary education can cultivate the critical, ethical, and affective capacities necessary for engaging with complex global challenges.

Keywords: *education for sustainable development and global citizenship, dialogic pedagogies, teacher research, curriculum innovation, art-based methods.*

Integrating Hospitality Software Applications in Tourism and Hospitality Higher Education: A Systematic Review

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Tourism and Hospitality (T&H) organizations are very much dependent on computer software applications which include Hospitality Property Management Systems, Point of Sale Systems (POS), Customer Relationship Management Systems (CRM) and Revenue Management Systems (RMS). Though rapid transformation can be identified within the tourism and hospitality industry, the curriculum in higher education continues to demonstrate limited practical software integration which directly contributes to graduate digital skill gaps and reduced employability. This systematic review targets to discover curriculum and pedagogical gaps related to combining hospitality software applications into T&H higher education programs and propose recommendations for curriculum enhancement. To conduct this systematic review, PRISMA 2020 framework was adopted to systematically review peer reviewed publications which were published between 2020-2025 from databases like Scopus, ScienceDirect, Emerald, MDPI, Taylor and Francis Online. Following the screening process, 20 studies were selected for thematic analysis from which four interconnected themes were identified. These themes include Split Curriculum Integration of Industry Application Software, Simulation Limitation for Experiential Learning, Uneven Digital Preparedness and Literacy of Educators, and Inadequate Academia-Industry Relationships. Through this review, it was identified that Software exposure within T&H Programmes remains more within the theoretical context, inconsistent and often considered optional rather than embedded as a core curriculum requirement. The study concluded that curriculum design, simulation-based pedagogy, continuous faculty development along with strengthening of vendor partnerships are important to enhance graduate digital competencies and industry readiness. The findings provide practical implications for curriculum developers, educators and policy makers in digitally evolving higher education environments.

Keywords: *Hospitality Software, Curriculum Design, Tourism Education, Digital Literacy, Pedagogy*

Exploring the Impact of Gaumiyyath on Students' Civic Identity: Perspectives of Teachers in Maldives

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Gaumiyyath plays a very important role in forming the civic identity, cultural awareness and social responsibility of students. In the Maldives, Gaumiyyath was introduced to schools aiming to foster national values, Islamic identity and citizenship, yet there has been limited research that investigates the role which Gaumiyyath plays in developing the civic identity of students. The objectives of this were to gain insights into the teachers' perspectives of the role of Gaumiyyath in civic identity formation of grade 5 and 6 students in the Maldives. Specifically, this study focused on the ways the subject promotes national values and civic identity, the teachers' views on students' understanding and engagement with civic concepts, and barriers to the effectiveness of the program. This research followed a qualitative research design using interpretivist paradigm. The five Gaumiyyath teachers selected through purposive sampling from five schools in Greater Male' Area were interviewed using semi-structured interviews. Ethical approval and institutional permissions were granted before data collection and participant confidentiality, and voluntary participation were ensured during the study. Based on the analysis, three interconnected themes were identified: (1) Gaumiyyath as a tool for National Identity and civic value formation, (2) student engagement and understanding of Gaumiyyath, and (3) structural challenges and the need to reform the curriculum. The teachers believed that it fostered pupils' national identity, cultural and religious identity and civic responsibility. They also saw civic identity formation as a process that went beyond patriotism to civic understanding, assimilation, and application in the daily life of students. Participants also said that interactive pedagogy, age-appropriate content, accessible language, greater recognition of civic education in schools, and sustained support from families and broader community are crucial to meaningful civic education. The study builds on the existing sparse literature on nationalism education in the Maldives by showing that teachers view the process of civic formation as a dynamic process that is influenced by the curriculum content, classroom-based education, and the broader social environment. The results shed light on curriculum review and teacher training in the Maldivian education system and help develop policies to improve civic education across the country.

Keywords: *Gaumiyyath, Nationalism Education, Civic Identity, Perspectives,*

Toxic Work Culture in the Future of Work: Employee Engagement and Turnover Intentions Across Generations

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Workplaces are undergoing significant transformation due to evolving employee expectations, generational diversity, and changing dynamics of the future of work. In this context, toxic work culture has emerged as a critical organizational challenge influencing employee experiences, engagement, and retention. This study examines the impact of toxic work culture on employee engagement and turnover intentions among Generation Y and Generation Z employees working in India's Non-Banking Financial Companies (NBFCs). Drawing upon Conservation of Resources (COR) Theory and Signalling Theory, the study explores work alienation as a mediating mechanism to understand how toxic workplace environments influence employee attitudes and behavioural outcomes. The study collects data from 609 employees across NBFCs in India using validated measurement scales. Confirmatory Factor Analysis (CFA) is employed to assess construct validity, while Structural Equation Modeling (SEM) is used to examine the proposed relationships and mediation effects. The findings highlight that toxic work environments deplete employees' psychological resources, generate negative organizational signals, increase work alienation, reduce employee engagement, and strengthen turnover intentions, particularly among younger generations of employees. Study contributes to the evolving literature on workplace transformation by explaining the psychological mechanisms through which toxic cultures shape employee outcomes in the future of work. The study provides practical implications for HR leaders and policymakers to design psychologically safe, engaging, and sustainable workplaces that address the expectations of a changing workforce. By highlighting the psychological consequences of toxic work environments, this study emphasizes the importance of employee wellbeing as a foundation for building psychologically safe, sustainable, and future ready workplaces.

Keywords: *Toxic Work Culture, Future of Work, Employee Wellbeing, Employee Engagement, Turnover Intention*

Designing for Acceptance: LMS-Based Professional Development in the Maldives

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The growing use of Learning Management Systems (LMS) in higher education demands professional development beyond basic content delivery. In the Maldives, LMS use remains largely administrative, revealing gaps in instructors' instructional design competencies. Limited studies connect instructional design quality with technology acceptance, particularly in Small Island Developing States. This study aimed to: (i) design an LMS-based professional development module using the ADDIE model and Community of Inquiry framework; (ii) examine how instructional design influences acceptance via UTAUT constructs; and (iii) explore social influence and contextual factors shaping engagement. A Design and Development Research approach with explanatory mixed methods was adopted. A needs analysis (N = 43) informed a Moodle-based module, implemented with 73 instructors (61 completed). Quantitative data came from a validated UTAUT-based questionnaire (23 items); qualitative data from a focus group discussion. Acceptance was strong, driven by instructional design quality. Performance Expectancy (M = 4.33) and Effort Expectancy (M = 4.28) were high; Social Influence was moderate (M = 3.76). Regression confirmed perceived usefulness and ease of use as strongest predictors. Qualitative findings reinforced these patterns: instructors praised the module's design, navigation, and authentic tasks enabling direct transfer to practice. Social influence emerged through peer interaction and facilitator presence, though participants desired more structured collaboration. Instructional design is a primary driver of technology acceptance in LMS-based professional development. Well-structured, practice-oriented design enhances perceived usefulness and ease of use. Social influence plays a reinforcing role and can be strengthened through intentional collaboration. OPD must be designed for usability, relevance, and social engagement, particularly in geographically dispersed contexts.

Keywords: *Learning Management Systems, Instructional design, Technology acceptance, Small Island Developing States, Community of Inquiry*

Exploring Watchkeeping Officers' Experiences of Competency Evaluation Through Ship Simulators

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The International Maritime Organization (IMO) mandates simulator uses in Maritime Education and Training (MET) under the STCW Convention. However limited empirical research addresses watchkeeping officers lived experiences regarding simulator-based competency evaluation. This study bridges this gap by investigating how officers and instructors perceive the effectiveness, demonstrated competencies, and systemic challenges of simulator assessments within the Maldivian context. A qualitative, phenomenological design was adopted to capture subjective professional experiences, data were gathered through semi-structured interviews and a focus group. The purposive sample comprised four active watchkeeping officers and three simulator instructors. Ethical clearance was granted by the Islamic University of Maldives, with measures for informed consent and participant confidentiality. Data was processed using thematic analysis. The findings reveal that simulators are highly valued for their realism, objectivity, and capacity to bridge the gap between maritime theory and practice while building officer confidence. Thematic analysis revealed simulators effectively evaluate both technical skills and critical non-technical skills. However, significant operational challenges emerged including limited situational fidelity regarding real-world unpredictability, subjective variability in instructor competence and assessment rubrics, restricted student access to practice time, and prohibitive institutional costs for hardware acquisition and maintenance. The findings underscore simulators as indispensable for competency development but call for systematic improvements in scenario design, transparent assessment frameworks, instructor training, and resource allocation. These insights imply an urgent need for policymakers and MET institutions to standardize scenario design, implement transparent assessment frameworks, formalize instructor training, and improve resource allocation to better prepare officers for modern navigational complexities.

Keywords: *Maritime Educational and Training, Navigational competence, Simulator-based assessment, Watchkeeping Officers, Instructor perspectives*

Mathematical Thinking in the Maldives: Ethnomathematics, Cultural Heritage, and Curriculum Integration

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This presentation draws on research conducted during my master's and doctoral studies that explored how mathematical knowledge is embedded within Maldivian culture. The research was motivated by the need to document and preserve indigenous knowledge systems that have traditionally been transmitted through practice and oral traditions rather than formal documentation. The objectives of the research were to identify and document traditional counting and measurement practices in the Maldives, examine their cultural and mathematical significance, and explore their implications for mathematics education. An ethnographic research design was employed, involving fieldwork, interviews, observations, and engagement with community knowledge holders, teachers, and students from different regions of the Maldives. The findings demonstrate that many traditional practices associated with fishing, boat building, navigation, and other activities involve sophisticated mathematical concepts related to measurement, estimation, proportional reasoning, spatial awareness, and problem solving. These practices reflect knowledge that has evolved over generations through interactions with the natural environment, culture, and historical influences. The research also revealed strong support among teachers and students for the inclusion of cultural knowledge within mathematics education. Drawing on these findings, an ethnomathematical curriculum model was developed to support the integration of indigenous knowledge and formal mathematics learning. The presentation will discuss the significance of documenting these practices for the preservation of Maldivian cultural heritage and consider how culturally relevant approaches can contribute to more meaningful and culturally relevant mathematics education.

Keywords: *Ethnomathematics, Maldives, Cultural Heritage, Mathematics Education, Curriculum Integration*

Nursing Students and Stakeholders: Repeating Subjects Policy Experiences at MNU

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Flexible learning models are widely implemented in higher education institutions to maximize accessibility and student autonomy. The Maldives National University implemented a policy allowing students to choose an alternative instruction mode (AMI), where they can only take final exams without attending regular lectures. However, limited evidence exists on students' learning experiences in flexible learning models and on their perceived support for independent learning. This study explored the experiences of nursing students repeating subjects under the repeating-subject policy. An interpretivist phenomenological approach was used, and data was collected through semi-structured interviews. This study involved five nursing students who repeated subjects under this policy, as well as interviews with relevant key stakeholders. Data were analysed using Braun and Clarke's thematic analysis framework. The findings suggested that although students appreciated the flexibility, autonomy, and emotional comfort associated with this AMI arrangement, they also faced challenges, including communication gaps, administrative friction, inconsistent policy implementation, limited interactions with lecturers, and varying levels of readiness for independent learning. Stakeholders identified the administrative and operational challenges affecting policy implementation. The study's findings revealed that flexibility alone might not be sufficient to sustain student engagement and self-directed learning among repeat nursing students. Structured academic guidance, clear communication channels, and appropriate scaffolding were identified as key factors influencing students' learning experiences. This study's findings provide valuable insights into understanding how flexible learning models are implemented within the nursing education context in the Maldives.

Keywords: *Flexible learning, Alternative mode of instruction, nursing students, Student Engagement, self-directed learning*

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Effectiveness of a Self-Directed Learning Tool in Promoting Peer Learning in Large Classrooms at the School of Nursing: The Maldives National University

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The Maldives National University

One of the major challenges experienced at the School of Nursing, The Maldives National University (MNU) is that the class sizes are usually big leading to low student performance, motivation, and engagement. There is a significant challenge in meeting individual students' needs due to pedagogical methods oriented towards educators. This study aims to assess how effective a self-directed learning tool is towards promotion of peer learning within large classrooms at the School of Nursing of MNU. A mixed-methods study was conducted involving quantitative and qualitative approaches; Seventy nursing students were assigned to control and experimental groups. Pre- and post-intervention tests were administered and analysed using SPSS to compare learning outcomes between the two groups. Qualitative data were collected through focus group discussions with participants in the experimental group. Audio recordings were transcribed verbatim and analysed thematically. Key findings showed that the experimental group demonstrated improved academic performance compared with the control group. The findings suggest that the self-directed learning tool positively influenced learning outcomes. Qualitative analysis brought out four main themes including: peer learning and feedback, alignment with learning objectives, motivation and engagement, and time management and distractions. Time constraints and distractions were among the obstacles faced by students in large classes, even though they reported increased engagement, motivation and academic performance because of a collaboration with the peers which is grounded on feedback and focused learning objectives. Integrating self-directed learning tools in large classrooms can substantially promote peer learning, student engagement, and academic performance. With this regard, the analysis offers evidence-based findings which support the use of learner-centred strategies that promote autonomy, collaboration, and active learning in nursing education. Long-term effectiveness as well as suitability in different contexts should be investigated in future studies focusing on this matter.

Keywords: *Learning tool, Nursing Education, Peer learning*

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Social Media Influencers influence - A mixed method study to understand social media influencers

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Social Media Influencers (SMIs) shape the perceptions, attitude and consumption behaviour of individuals. Thus, this study aims to examine the influence of social media influencers on travel decisions, by employing a mixed approach of qualitative and quantitative methods. The findings indicate that social media influencers play a meaningful role in generating travel inspiration and assisting travellers during the information search stage. Survey results revealed that many respondents follow travel influencers and engage with their content, particularly on visual platforms such as Instagram. Influencer posts showcasing travel experiences, destinations, and lifestyle imagery appear to stimulate interest in travel and contribute to shaping perceptions of destinations. The qualitative interview findings further supported these conclusions by highlighting that tourism businesses primarily use influencers to increase brand visibility, generate awareness, and reach targeted audiences. The interview also revealed that the effectiveness of influencer marketing is often evaluated through engagement metrics and inquiries rather than direct bookings. Additionally, authenticity and credibility were identified as important characteristics of successful influencers, as audiences are more likely to trust influencers who demonstrate expertise and genuine travel experiences. Overall, the findings of this study highlight the growing importance of social media influencers as a marketing tool within the tourism industry. Although influencers may not directly drive travel purchases, they play an important role in shaping travel inspiration, destination awareness, and online engagement among travellers.

Keywords: *Social media, Influencers, Influencer marketing, Tourist behaviour, Destination choice*

Micro-Credentials for Lifelong Learning and Workforce Resilience: A Systematic Literature Review

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Micro-credentials (MCs) are short, modular, competency-based certifications that provide flexible alternatives to traditional degree programmes. As rapid technological change transforms labour markets, adult learners increasingly rely on MCs to upskill and reskill while maintaining full-time employment. This study explores the role of micro-credentials in promoting lifelong learning and strengthening workforce resilience through a systematic literature review. Twenty-nine peer-reviewed studies were identified from Scopus and Web of Science using predefined search strategies, Boolean operators, and inclusion and exclusion criteria. The PRISMA framework guided the screening process, while thematic analysis was employed to synthesise the findings. The review identified three key contributions of micro-credentials: supporting lifelong learning through flexible and personalised learning pathways; enhancing workforce resilience by improving employability, adaptability, and continuous skill development; and strengthening the alignment between education and labour market needs through competency-based, stackable, and industry-recognised credentials. The findings further indicate that the effectiveness of MCs depends on robust quality assurance, institutional support, employer recognition, and collaboration between higher education institutions and industry. This review concludes that micro-credentials complement traditional qualifications by enabling continuous professional development and helping individuals adapt to evolving workforce demands. The study contributes a comprehensive synthesis of current evidence and highlights the need for future research on institutional readiness, employer acceptance, quality assurance frameworks, and learner progression through stackable credential pathways. These findings provide practical insights for educators, policymakers, and industry stakeholders seeking to develop sustainable lifelong learning ecosystems.

Keywords: *Micro-credentials, Lifelong Learning, Workforce Resilience, Employability, Systematic Literature Review.*

Internationalization of Higher Education (IoHE): A Review of Opportunities and Challenges

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IoHE is a process that focuses on the programming of higher education activities in the areas of teaching, research, and service through the recruitment of international students, cooperation or partnerships with foreign universities, and the establishment of branch campuses with countries and across the globe. This review examined the opportunities and challenges of implementing IoHE activities across countries, including Southeast Asia. A comprehensive search was conducted using ERIC, Scopus and Google Scholar for studies published between 2022-2026, yielding 56 peer reviewed articles. Emerging themes revealed global shifts and priorities having an impact on the changing landscape of IoHE over the past few decades. Literature recognizes the importance of the higher education sector to see the benefit of international engagement, including enhancement of teaching and learning, promoting the mobility of individual students and staff, quality development of the courses, building institutional reputation and attractiveness, facilitating large-scale research endeavours, capacity building, and enhanced international cooperation. Some of the most reported obstacles across the studies were at individual levels, including issues related to adjustment or coping, limited resources, and language incompetence. Other barriers included administrative or bureaucratic difficulties, growing nationalization trends, mismatches with institutional capacity, bans on immigration, disasters, health hazards, and access to reliable internet and technology. Similar opportunities and challenges were identified among Southeast Asian countries, despite not having well established mechanisms of IoHE. Literature has consistently shown IoHE as an evolving process impacted by institutional priorities, global trends, and local limitations.

Keywords: *IoHE, Higher Education, Internationalization, International Engagement*

Voices from The Classroom: Foundation and Certificate Level Students' Perspectives on Collaborative Learning in an EAP course

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Collaborative learning is an increasingly important pedagogical approach in English for specific purposes (ESP) due to its potential to promote student engagement, language development, and active participation. Similarly, English for Academic purposes or EAP is one of the most important branches of ESP because it focuses on teaching English for the specific context of academic study, rather than for general communication. This study explores Foundation and certificate-level students' perspectives on collaborative learning in an EAP classroom. The purpose of the study is to examine how students perceive collaborative learning activities, the benefits they associate with such approaches, the challenges they encounter when working with peers and suggested improvements. Adopting a qualitative case study design, the research draws on semi-structured interviews with foundation and certificate-level students who have participated in collaborative learning activities. Participants were selected through purposive sampling based on their experience with group-based learning tasks. The interview data were analysed using thematic analysis to identify recurring patterns and themes in students' experiences. The findings indicate that students generally view collaborative learning positively; highlighting benefits such as improved communication skills, enhanced understanding of content, increased confidence in using English, opportunities to learn from peers, and improvements in vocabulary, speaking, writing, and presentation skills. Collaborative activities also encouraged active participation, fostered social interaction, and created a supportive learning environment. However, several challenges emerged, including unequal participation among group members, differences in language proficiency, and occasional difficulties in reaching consensus during group tasks. Participants also suggested including more educational games in collaborative tasks and selecting leaders by the instructor as improvements.

Keywords: *English for specific purposes, English for academic purposes, Collaborative learning, Active participation, Language Learning*

Teachers' Knowledge, Beliefs, and Practices of Social and Emotional Learning: A Quantitative Study in Maldivian Public Schools.

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Social and Emotional Learning (SEL) is increasingly recognized as an essential component for fostering students' academic success, well-being, and holistic development. While international research highlights the influence of teachers' knowledge and beliefs on SEL implementation, evidence from small island developing states remains limited. This study examined Maldivian public school teachers' knowledge of SEL concepts, their beliefs, and the extent to which they integrate SEL practices into classroom teaching, and the relationships among these constructs. A quantitative cross-sectional survey was conducted with 216 teachers across 11 schools in Greater Malé. Descriptive analyses revealed that teachers demonstrated moderate to high knowledge of SEL, held strongly positive beliefs regarding its importance, and reported moderate to high engagement in SEL practices. Correlation analyses indicated significant positive associations among knowledge, beliefs, and practices, underscoring the interconnected nature of these dimensions. The findings suggest that teachers with stronger understanding and more positive orientations are more likely to implement SEL practices, though barriers such as limited time and insufficient training constrain integration. By situating SEL within the Maldivian context, this study contributes to the limited literature on SEL in small island nations and provides evidence to inform educational policy, teacher training, and curriculum design aimed at enhancing student well-being and resilience.

Keywords: *Social and Emotional Learning, Teacher knowledge, Teacher beliefs, Teacher practices*

Rethinking Technology Integration in Higher Education: A Data-Driven Model of Pedagogy, Engagement, and Learning

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Current discussions about technology in higher education are focused on its capacity to enhance teaching and broaden access to learning. For many lecturers, the greater availability of digital tools has not always led to meaningful integration of technology into pedagogy. The present study fills this gap by developing an empirically grounded model of technology integration in higher education. A mixed methods approach was used. The first phase comprised a survey with the lecturers and students to explore their perceptions about the use of technology, teaching practices and student engagement. Data were analysed using Exploratory Factor Analysis (EFA) and the results revealed five significant constructs; technology integration, pedagogical design effectiveness, teaching presence, social presence and cognitive engagement. These constructs exhibited strong factor loadings and internal consistency and were used to develop a preliminary conceptual model that linked these variables to perceived learning effectiveness. Findings indicate that technology integration does not directly affect learning outcomes but is mediated by pedagogical design and teaching presence which influences student engagement. Social presence also played an important role in the perceived learning effectiveness and cognitive engagement. The additional surveys and semi-structured interviews will be used for further implementation and validation of the proposed model. In conclusion, the study offers an empirically supported framework that can help higher education institutions to develop effective, technology-enhanced, and learner-centred environments, thereby improving teaching practices and student learning experiences.

Keywords: *Higher Education, Technology Integration, Techno-Pedagogical Model, Student Engagement, Teaching Effectiveness*

Investigating Prospective Students' Intentions to Enrol in Library and Information Science Programmes in the Maldives: An Application of the Theory of Planned Behaviour

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The Maldives National University

Library and Information Science (LIS) education plays a critical role in developing information professionals capable of supporting education, research, governance, and knowledge-based development. Despite the increasing importance of information management in the digital era, many higher education institutions continue to experience declining enrolment in LIS programmes. The Maldives National University (MNU), the country's sole provider of formal LIS qualifications, has similarly experienced persistently low student enrolment, raising concerns regarding the sustainability of LIS education and the future supply of qualified professionals. Guided by the Theory of Planned Behaviour (TPB), this study examined the factors influencing prospective students' intentions to enrol in LIS programmes at MNU. A quantitative cross-sectional survey was conducted among 112 Foundation Studies students using a structured questionnaire. Multiple linear regression revealed that subjective norms and perceived behavioural control significantly predicted prospective students' enrolment intentions, whereas attitude did not significantly predict intention after controlling for the other TPB constructs. These findings suggest that enrolment decisions are influenced more strongly by social support and students' perceptions of their ability to pursue LIS education than by favourable attitudes towards the profession alone. The study extends the application of the Theory of Planned Behaviour to Library and Information Science education within a Small Island Developing State (SIDs) and provides evidence to inform recruitment strategies, programme promotion, and policy initiatives aimed at strengthening the sustainability of LIS education in the Maldives.

Keywords: *Library and Information Science, Theory of Planned Behaviour, Enrolment intention, Higher education, Small Island Developing States*

The Factors Leading to Low Cumulative Grade Point Average (CGPA) Among Undergraduate Nursing Students at the The Maldives National University

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Academic performance is a critical factor influencing educational success and professional readiness in nursing education. Despite the continuous academic guidance and support, only few students achieve a high GPA. Yet, little is known about the factors that shape academic performance in the Maldivian nursing education context. Therefore, the present study explored the factors causing low CGPA among undergraduate nursing students at MNU.Using a qualitative, exploratory, phenomenological approach, data were collected from six fourth-year undergraduate nursing students at MNU. Analysis of data collected through semi-structured interviews revealed several key themes influence students' academic performance including quality of teaching, lecturer's competence, feedback, heavy academic workload, financial obligations, family obligations, stress, burnout, clinical placement obligations, and institutional support, academic performance is the result of multiple factors as opposed to individual efforts alone. The current study reveals that improving academic performance requires a holistic approach to engage educators, institutional authorities, and students. Strengthening student-centred teaching approaches, academic counselling, psychological counselling, clinical supervision, and institutional systems of support can foster student success and contribute to preparing competent nursing professionals in the Maldives

Keywords: *Academic Performance, Cumulative Grade Point Average, Undergraduate nursing students, Teaching pedagogy*.

Graduate Employability and Workforce Readiness Among Faculty of Health Sciences Graduates.

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Graduate employability is an important indicator of programme quality and workforce relevance in higher education. This study examined employment outcomes and perceived workforce readiness among graduates of the Faculty of Health Sciences (FHS), The Maldives National University. A cross-sectional online survey was conducted among graduates from different FHS programmes. The survey collected data on employment status, time taken to secure employment, job relevance, job satisfaction, and self-perceived preparedness across key professional competencies. Descriptive statistics were used to analyse the data. A total of 265 graduates participated in the survey. Most respondents were employed full-time (83.0%), while 4.2% were unemployed and seeking employment. Nearly two-thirds (65.3%) secured employment before graduation, and a further 20.4% obtained employment within three months of graduating. Most graduates reported working in positions directly related to their field of study (65.3%), while 16.6% were employed in somewhat related fields. Job satisfaction was generally high. Graduates reported the highest levels of preparedness in ethical and professional practice (mean = 4.17/5), teamwork (mean = 4.06/5), and independent working skills (mean = 4.05/5). Lower ratings were reported for research skills (mean = 3.68/5) and digital competencies (mean = 3.66/5). FHS graduates demonstrated strong employment outcomes and high levels of perceived workforce readiness. The findings highlight the relevance of FHS programmes to national workforce needs while also identifying opportunities to strengthen research and digital competencies.

Keywords: *Employability, Graduate Outcomes, Workforce Readiness, The Maldives National University, Lifelong learning*

Bilingual Communication in the Workplace: A sociolinguistic Analysis of the Language Choice among Maldivian Youth

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The increase influence of English in the linguistic practices of young Maldivians has raised concerns regarding the long-term vitality of Dhivehi, the national language of the Maldives. As bilingualism becomes more prevalent in professional settings, it is important to understand language choice within workplace interactions. Therefore, the main objective of this study is to examine the language choice of Maldivian bilingual youth in the Employment Domain. The study employed a mixed methods approach using a survey questionnaire, interviews, and workplace observations. Quantitative data were collected from 400 Maldivian bilingual youth, through an adapted survey questionnaire and was analysed using descriptive statistics. Qualitative interview and observation data were used to provide further insights into participants' language practices in workplace communication. The findings revealed that Dhinglish is the predominant language variety used in workplace interactions. Majority of the participants reported using Dhinglish when communicating with their colleagues respectively. English is the second most frequently used language across all workplace interactions, whereas as Dhivehi is used by only a small proportion of the participants. Qualitative findings further confirmed that workplace communication primarily occurs in Dhinglish and English, with occasional use of Dhivehi only. These findings contribute to ongoing sociolinguistic concerns regarding language shift, suggesting that the increase reliance on English and code mixing of English and Dhivehi within formal workplace interactions may gradually reduce the functional domain of Dhivehi. This highlights the importance of language planning and developing language maintenance initiatives that promote balanced bilingualism while supporting the continued vitality of Dhivehi alongside English in professional settings.

Keywords: *Language Choice, Employment Domain, Workplace Communication, Maldivian Bilingual Youth, Dhinglish*

Cognitive Presence as a Predictor of Learner Satisfaction in Blended Learning: Preliminary Validation and Empirical Evidence

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The purpose of this study is to examine the role of cognitive presence as a predictor of learner satisfaction in blended learning. While blended learning being extensively adopted in higher education due to its flexibility and accessibility, the quality and effectiveness of these learning experiences should be ensured. In this regard, learner satisfaction reflects their perception of the quality of learning and cognitive presence can provide valuable insights on learner satisfaction. This research employed a quantitative data collection method and a self-administered survey questionnaire. The study which was carried out in two phases, pilot and the main study, evaluated the measurement model and established reliability and validity of the constructs using data from (N= 321) respondents. Indicator reliability was evaluated through outer loadings, while internal consistency (using Cronbach's Alpha (α) and convergent validity were explored using reliability assessment techniques including average variance extracted (AVE). Then, the structural model of the recommended relationship between cognitive presence and learner satisfaction was determined. The findings supported the impact of cognitive presence on learner satisfaction in blended learning. Thus, it highlights the significance of learning design that nurtures inquiry, reflection, knowledge creation and practical application of problem solving. By demonstrating cognitive presence as major contributor in shaping positive learner experiences, this study supports blended learning research. Additionally, the findings facilitate educators and instructional designers to develop more effective blended learning environments.

Keywords: *cognitive presence as a predictor of learner satisfaction, cognitive presence, learner satisfaction, blended learning, cognitive presence as a predictor of learner satisfaction in blended learning*

Knowledge and Competency of Triage in Undergraduate Nursing Students of The Maldives National University

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The Maldives National University

Triage is a critical component of emergency care that requires adequate knowledge and clinical competency among nursing students to ensure timely and appropriate patient prioritization. However, limited exposure to emergency settings may affect students' preparedness. This study aimed to identify the level of knowledge and competency of triage among undergraduate nursing students at The Maldives National University and to examine differences based on prior exposure to the emergency room (ER). A descriptive cross-sectional study was conducted among 60 undergraduate nursing students selected through convenience sampling. Data were collected using structured questionnaires assessing triage knowledge and competency, with ethical considerations maintained throughout the study. Descriptive statistics and independent samples t-test were used for analysis. The mean knowledge score was 11.90 (SD = 2.25; range: 8 - 17), indicating a moderate level of knowledge. The mean competency score was 96.73 (SD = 18.55; range: 57 - 135), also reflecting moderate competency. There was no statistically significant difference in knowledge scores between students with and without ER exposure ($t = 1.094$, $p = 0.278$). However, a statistically significant difference was found in competency scores ($t = -2.410$, $p = 0.019$), with higher competency observed among students with prior ER exposure. These findings highlight the importance of clinical exposure, particularly in emergency settings, to enhance practical triage skills. Incorporating more ER-based training and simulation into nursing curricula is recommended to improve triage competency.

Keywords: Triage, Knowledge, Competency, Nursing students, Emergency room exposure

Strengthening School Leadership for Effective Professional Learning Communities: Evidence from the Maldivian Schools

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Addu City Council

The digital transformation of education demands collaborative professional cultures supported by strong school leadership. Although Professional Learning Communities (PLCs) are widely recognized as a catalyst for improving teaching and learning, their effectiveness remains constrained in many schools by hierarchical leadership structures and limited teacher autonomy. Despite the global prominence of school leadership and PLCs in the educational development, empirical evidence from resource-constrained small island contexts such as the Maldives remains limited. The study addresses this gap by examining the relationships among leadership practices (LP), school conditions (SC), PLCs, and the Quality of Teaching (QT), while examining the mediating role of PLCs between LP and QT. A quantitative cross-sectional survey was conducted with 431 teachers across Maldivian schools. Data were analysed using SPSS-24 and AMOS-24, and Structural Equation Modelling was applied to test the hypothesized relationships. The findings revealed that both LP and SC significantly predicted PLC development, while LP also exerted a significant direct influence on QT. Teacher leadership emerged as a particularly influential dimension, underscoring its critical role within the broader leadership framework. Contrary to prevailing assumptions, PLCs neither significantly influenced QT nor mediated the relationship between LP and QT. These findings suggest that establishing PLC alone is insufficient for classroom improvement without authentic collaboration, professional trust, and effective institutional implementation. The study extends leadership and PLC research within small island developing states and offers policy and practice implications by highlighting teacher leadership as a strategic lever for strengthening PLCs and advancing sustainable school improvement and educational quality.

Keywords: *Professional Learning Communities, School Leadership, Quality of Teaching, Education, Maldives*

Are Our Teacher Graduates Classroom Ready? Exploring School Leaders' Perceptions of Graduate Employability and Competency Development

Aminath Waseela
The Maldives National University

In the context of increasing expectations for high-quality teaching and professional competence, there is growing interest in how effectively initial teacher education programs prepare graduates for the complexities of real classroom environments. This paper is an extension of the study titled "Investigating School Leaders' Perceptions of the Performance of The Maldives National University Graduates", which seeks to understand graduate readiness from the perspective of employers. Underpinned by the Career EDGE framework, the study integrates key dimensions of employability, including subject knowledge, practical experience, transferable skills, emotional intelligence, and self-efficacy. Survey data gathered from 72 school leaders, comprising principals, deputy principals, leading teachers, and practicum coordinators from schools across the country were analysed using descriptive statistics to examine their perceptions of graduate competencies across multiple dimensions of the Career EDGE framework. Findings indicate generally positive perceptions regarding MNU graduates. Respondents strongly endorsed graduates' employability and highlighted strengths in pedagogical application of theory, collaboration and practicum-related confidence development. However, moderate ratings were observed in areas such as emotional regulation, problem-solving skills, and engagement with parents and wider school communities. Concerns were also noted regarding practicum duration adequacy and early-career independence. Overall, the findings suggest that while graduates are perceived as well-prepared and employable, targeted improvements are needed in soft skills, emotional intelligence, and transition-to-work support. By providing empirical evidence, the study contributes to ongoing discussions on strengthening teacher education programs to better align graduate competencies with workforce expectations.

Keywords: *Teacher Education Curriculum, Graduate Competency, School Leader Perceptions, Curriculum Relevance and Adequacy, Teaching Practicum*

Clinical Mentoring in Nursing Education: A Phenomenological Exploration of Mentors' and Student Nurses' Lived Experiences in the Maldives

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Clinical mentoring is a fundamental component of nursing education, enabling students to integrate theoretical knowledge with safe, competent, and professional practice. The quality of clinical mentoring depends on mentor–student relationships, workplace demands, organisational support, and the clinical learning environment. Although clinical mentoring is vital to students' professional development, limited evidence exists on how mentors and student nurses experience this process in small-island healthcare contexts. This study therefore aimed to explore the lived experiences of clinical mentors and Bachelor of Nursing students and identify the challenges, supportive practices, and workplace factors influencing clinical mentoring in the Maldives. A descriptive phenomenological approach was employed. Twenty participants, involving ten clinical mentors and ten Bachelor of Nursing students with clinical mentoring experience, were selected through purposive sampling. Data was collected through separate semi-structured focus group interviews with clinical mentors and student nurses. The interviews were audio-recorded with consent, transcribed verbatim, and translated into English where necessary. Data were analysed using Braun and Clarke's six-phase thematic analysis framework, ensuring adherence to Guba and Lincoln's criteria for trustworthiness throughout the research process. The study was conducted as part of a postgraduate programme at IUM, with ethical approval from the IUM Ethics Committee and informed consent from all participants. Six themes emerged: theory–practice gaps and expectations, active guidance and student involvement, respectful communication and trust, personal growth and confidence, feedback and evaluation practices, and workload and workplace conditions. Effective mentoring enhanced confidence, professional identity, and reflective learning, whereas inadequate guidance, inconsistent feedback, and workload pressures hindered students' clinical learning. Clinical mentoring in nursing education requires structured orientation, prepared mentors, supportive clinical environments, dedicated mentoring time, and strong academic–clinical collaboration. These findings provide evidence to strengthen mentoring practices in the Maldives and similar small island healthcare systems.

Keywords: *clinical mentoring, nursing education, student nurses, mentors, clinical learning environment*

Transforming nursing education by integrating Artificial Intelligence- A systematic Review

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Artificial Intelligence (AI) is transforming nursing education by enhancing teaching and learning through innovative educational approaches. AI has emerged as one of the most significant transformative forces in the world of technology influencing nursing education. This systematic review aimed to examine how AI is incorporated into nursing education. Objectives for this study are to examine the integration and application of Artificial intelligence in nursing education, Evaluate the effects of using Artificial intelligence on nursing student's learning outcomes and explore the challenges, limitations associated with integration of Artificial intelligence in nursing education. This study adopted a Systematic Literature Review design guided by Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. An extensive literature search was conducted through various electronic databases including PubMed, EBSCO host and research4life which identified 827 records. After screening and eligibility assessment, 35 studies were included. Eligible studies include randomised controlled trials (RCTs), Quasi experimental studies, cross sectional studies and mixed-methods studies. The included studies involved nursing students and nursing educators and focused on AI-based educational strategies. The methodological quality of the studies was assessed using The Joanna Briggs Institute (JBI) critical appraisal checklist. Data were synthesised using a narrative synthesis approach guided by Popay et al. (2006), involving coding, comparison, and grouping of findings to identify patterns and analytical themes across studies. Four themes emerged from the synthesis: (1) AI enhances learning outcomes, clinical competence, and self-directed learning; (2) Educational impact of AI on nursing students' learning outcomes and competency development; (3) Challenges, risks, and ethical complexities of integrating AI in nursing education; and (4) Readiness and institutional capacity for sustainable AI integration and institutional support requirements. This synthesis indicates that there are both positive and negative impacts of AI integration in nursing education. The study suggests that effective AI integration in nursing education requires proper student and faculty training, organisational support and investment in technological infrastructure.

Keywords: *Nursing education, Artificial Intelligence, Educational technology*

Unregistered Media Issues: Impact on Public Trust and Integrity

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The swift growth of unregistered media platforms in the Maldives has raised concerns about misinformation, perceived risk and media literacy. The purpose of the study was to examine how unregistered media influences public trust and integrity, with specific focus on public awareness (H1), Regulatory approaches (H2), and Media Awareness (H3). Using a quantitative cross-sectional survey data collected by 218 participants from diverse age groups across the Maldives through online questionnaire measured awareness, perceived risk, media literacy, trust, and attitudes toward regulation. The data analysed was tested by Descriptive statistics, Reliability test, Normality test, Factor Analysis including Pearson correlations and Multiple linear regression where over 79.4% of valid respondents Strongly Agree and 17.0% Agree. Correspondingly, strong positive correlation emerged between Perceived Risk & Accountability and Attitude Towards Regulation showed ($r = .443$, $p < .001$), and regression analysis confirmed perceived risk as the only significant predictor of sustenance for stronger regulatory mechanisms, subsidiary to H2. This highlights the need for clear accountability and protection of media freedom in the Maldives

Keywords: *Unregistered Media, General Trust Heuristic, Public Perception, Media Regulation, Institutional Integrity*

Keeping the Flame Alive: A Strengths-Based Framework for Teacher Sustainability in the Maldivian Education System

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Islamic University of Maldives

Teaching is increasingly shaped by expanding professional responsibilities, growing accountability demands, technological change, and evolving societal expectations, raising global concerns about teacher well-being, burnout, and retention. While existing research has predominantly focused on the causes and consequences of teacher stress and attrition, comparatively little attention has been given to understanding the factors that enable teachers to sustain their commitment and professional fulfilment. This qualitative study explores teacher sustainability within the Maldivian education system through a strengths-based perspective. Guided by an interpretivist paradigm, semi-structured interviews were conducted with ten teachers from government and private schools in the Greater Malé Region. Data were analysed using Braun and Clarke's thematic analysis, leading to the development of a Strengths-Based Framework for Teacher Sustainability. The framework comprises four interrelated dimensions: professional demands in a changing education system, emotional challenges along the sustainability journey, protective organizational and social resources, and passion and purpose as drivers of long-term professional commitment. Although participants described increasing workloads, episodic emotional exhaustion, work-life imbalance, and changing perceptions of the teaching profession, none expressed intentions to leave teaching. Instead, supportive leadership, collegial relationships, family support, intrinsic passion, professional purpose, and opportunities for continued professional growth emerged as key protective factors that sustained engagement and resilience. The study contributes to the emerging literature on teacher sustainability by shifting attention from deficit-oriented narratives of burnout and attrition towards a strengths-based understanding of how teachers remain committed despite increasing professional demands. The proposed framework offers a contextually grounded model to inform educational leadership, teacher support initiatives, and policy development in the Maldives and other small island developing states.

Keywords: *Teacher sustainability, strengths-based framework; teacher well-being, professional commitment, educational leadership*

Teachers' perspective on cooperative learning in key stage 4 classrooms in Malé public school

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This study examines teachers' perspectives on cooperative learning in Key Stage 4 classrooms in one public school in Malé, Maldives. The study is important because, although cooperative learning is widely associated with improved engagement and learning, there is limited context-specific evidence on how it is understood and implemented in Maldivian secondary classrooms, and on the practical barriers that affect its use. The study aims to identify the factors that hinder the effective implementation of cooperative learning and to explore teachers' opinions and experiences of using it in Key Stage 4 classrooms. Using a qualitative research design, data were collected through interviews with ten secondary school teachers and classroom observations. The data were analysed thematically and interpreted in relation to social dependency theory. The findings suggest that cooperative learning has clear pedagogical value, but its effective implementation is shaped by several constraints, including limited time, classroom diversity, syllabus demands, and the need for better planning flexibility. Teachers also indicated that professional training would help them apply cooperative learning more effectively. The study concludes that cooperative learning is feasible in the classroom context studied, but its success depends on appropriate teacher preparation, supportive planning, and classroom conditions that allow collaborative activity to take place effectively.

Keywords: *Cooperative Learning, Teacher perceptions, Secondary Education, Teaching Practices, Collaborative Learning*

Tracing MNU Foundation Graduates: A Conceptual Framework for Evaluating Preparedness, Outcomes and Progression

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Foundation programmes are significant in widening access to higher education by providing an alternative pathway for students who do not meet the direct requirements for undergraduate programmes. At The Maldives National University, the Centre for Foundation Studies offers MQA-approved foundation courses in Science, Business, and Humanities to facilitate students' transition into degree programmes. Despite their long-standing implementation, limited evidence exists regarding the effectiveness of these courses. This paper presents the theoretical and conceptual foundations underpinning research designed to trace students who have completed the foundation courses to investigate their preparedness, achievement, and progression in undergraduate courses, and evaluate the effectiveness of foundation courses offered at MNU. Drawing on Student Integration Theory, Student Adaptation Theory, Self-Efficacy Theory, and Constructive Alignment Theory, the paper proposes an integrated framework explaining how Foundation learning experiences, academic readiness, self-efficacy, institutional integration, and transition experiences interact to influence graduates' preparedness, academic outcomes and progression in degree programmes. Using a mixed-method tracer study framework, the study combines institutional records, a graduate survey, graduate interviews and stakeholder interviews to systematically examine graduates' experiences. The proposed framework offers a theoretically informed basis for evaluating the effectiveness of foundation courses at MNU and provides evidence-based recommendations for enhancement of curriculum and student support activities. The study is expected to contribute to institutional decision-making regarding foundation courses and extend literature on foundation pathways in higher education contexts.

Keywords: *Foundation programmes, tracer study, student success, academic preparedness, progression*

Identifying Learning Challenges Amongst Preschoolers: A Case Study from an International School in Greater Malé Area

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Early identification of learning challenges is very important during the preschool years as it supports children's cognitive, social and emotional development and helps develop their long-term educational results. Despite, limited research on the learning challenges experienced amongst preschoolers within in international preschool setting in the Maldives. This research aims to primarily understand determine the main learning obstacles faced by preschoolers and investigate the techniques and approaches teachers employ to recognize and resolve these obstacles. A qualitative case study design was employed. Data were collected through 12 semi-structured interviews involving six preschool teachers and six parents, together with four classroom observations. Participants were selected using purposive sampling. The data were analysed using Braun and Clarke's thematic analysis approach. The findings revealed four major learning challenges experienced by preschoolers: fine motor skill difficulties, attention and focus limitations, social-emotional developmental gaps, and memory retention issues. The study also identified four key strategies used by teachers to recognise and address these challenges: continuous classroom observation, naturalistic and informal assessment, collaboration between teachers and parents, and differentiated play-based interventions. The findings highlighted the importance of combining classroom observations with parental input to support early identification and intervention. The study concludes that effective identification and management of preschool learning challenges require strong collaboration between teachers and parents, ongoing classroom observation, and developmentally appropriate teaching approaches. Play-based learning and differentiated instructional strategies were found to promote greater engagement and provide targeted support for children experiencing learning difficulties. The findings contribute to the limited body of research on preschool learning challenges in the Maldivian context and provide practical recommendations for improving inclusive early childhood education.

Keywords: *Early childhood education, Learning Challenges, Play based learning, Teacher's perspectives, Early intervention*

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A qualitative exploration of Peer Support and Students' Willingness to Learn in Higher Education

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Peer support has increasingly been identified as an important element for enhancing teaching and learning and student success. Many international studies have shown that it promotes collaborative knowledge construction, fosters student engagement, and contributes to the development of both cognitive and socio-emotional skills. However, there is limited research on peer support in the Maldivian context, particularly in higher education. This study looked into the experiences of education students regarding peer support and examined how these experiences affect students' willingness to learn and participate in activities. A qualitative approach was employed to collect interview data from students enrolled in undergraduate programs at a higher education institution. The study sample comprised six participants who volunteered to take part in the research. Thematic analysis was employed to identify key patterns and insights related to peer interaction, collaborative learning strategies, and perceived learning outcomes. The findings show that positive peer relationships encourage participation, while helping them build confidence, foster engagement and motivation towards learning. In contrast, negative peer interactions reduce participation and hinders performance. The study highlights the need for creating environments that promote peer interaction and maximize student potential in higher education contexts.

Keywords: *Peer support, Higher education, Willingness to learn, Student engagement, Qualitative research*

Early English Exposure and Its Impact on Dhivehi Language Acquisition: A Study of Linguistic and Cognitive Development in Maldivian Children

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The increasing dominance of English in Maldivian education and daily communication has raised concerns about potential attrition of Dhivehi, the national language and a key marker of cultural identity. This study investigates the impact of early English exposure on Dhivehi language acquisition and proficiency among Maldivian children and examines associated cognitive and linguistic outcomes. To achieve this, a concurrent mixed-methods triangulation design was deployed, sampling 100 Maldivian children aged 5–7 years from schools in Malé, alongside their parents and teachers. Quantitative data were collected using standardized language proficiency tests in both Dhivehi and English to assess vocabulary, grammar, and pronunciation, while qualitative data were gathered through semi-structured interviews and focus group discussions to capture attitudes toward bilingualism and language policy. By explicitly addressing the study's primary objectives, the empirical results demonstrate that early English exposure correlates with reduced proficiency in specific domains of Dhivehi, evidenced by a narrower formal vocabulary, weaker grammatical structuring, and subtle phonetic shifts. Furthermore, a widening gap was identified between high receptive understanding and weaker expressive capability in Dhivehi. Conversely, the data rationally establish the cognitive advantages of bilingualism, showing significantly enhanced problem solving, working memory, and multitasking capabilities in children who maintain balanced proficiency. The linguistic data also reveal high rates of conversational code-switching, underscoring a fluid bilingual identity. Qualitative insights highlight a critical tension among stakeholders, who value English for its global utility but voice deep anxieties over the erosion of Dhivehi. In conclusion, these findings directly answer the call for systemic educational reform, providing a rational framework for policy recommendations that promote balanced bilingualism through structured curriculum adjustments, targeted bilingual education models, and language reinforcement strategies to safeguard Dhivehi in a globalized world.

Keywords: *Dhivehi, bilingualism, early English exposure, language acquisition, cognitive development, language policy, Maldives*

Structured Peer Feedback in ESL Argumentative Writing: Students' Perceptions and Experiences

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Developing effective writing instruction requires pedagogical approaches that promote active learning, collaboration, and meaningful student engagement. In English as a Second Language (ESL) writing classrooms, structured peer feedback encourages learners to exchange constructive feedback, reflect on their writing, and actively participate in the writing process. This study investigated students' perceptions and experiences of structured peer feedback during argumentative writing among Maldivian secondary school students. Guided by Vygotsky's Sociocultural Theory, the study adopted a mixed-methods single-case design. Using purposive sampling, the study involved 30 Grade 10 ESL students from a secondary school in the Maldives. Prior to data collection, participants received structured peer feedback training supported by an analytical writing rubric. Data were collected through a survey questionnaire and semi-structured interviews and analysed using descriptive statistics and thematic analysis. The findings indicated that students perceived structured peer feedback as useful, motivating, trustworthy, and fair. They also reported that peer feedback training, supportive peer interactions, and the analytical writing rubric enhanced their engagement in the feedback process and promoted collaborative learning during argumentative writing. The findings highlight the pedagogical value of structured peer feedback in fostering meaningful student interaction and active participation in ESL writing classrooms. The study suggests that integrating structured peer feedback into writing instruction can strengthen collaborative learning and enrich the teaching and learning of argumentative writing.

Keywords: *Structured peer feedback, ESL writing, Learner autonomy, Collaborative learning, Students' perception*

Enhancing the cognitive and linguistic dimensions of ESL argumentative writing through peer feedback

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Developing effective argumentative writing requires learners to integrate higher-order cognitive processes with accurate linguistic expression. In English as a Second Language (ESL) classrooms, peer feedback (PF) has gained recognition as a pedagogical approach that encourages learners to evaluate, revise, and refine their writing through collaborative interaction. This study examined how PF contributed to the cognitive and linguistic development of argumentative writing among Maldivian secondary school students. Guided by Vygotsky's sociocultural theory, particularly the concepts of the Zone of Proximal Development and Scaffolding, the study reports selected findings from a mixed-methods single-case study involving 30 Grade 10 ESL students from a secondary school in the Maldives. Students completed pre- and post-intervention argumentative writing tasks following PF; an analytical writing rubric supported these activities. Writing performance was analysed using descriptive statistics to compare pre- and post-writing scores and to examine improvements in cognitive and linguistic dimensions of writing. Qualitative content analysis of the three most improved writing samples complemented the statistical findings by providing an in-depth examination of changes in students' written work. The findings demonstrated notable improvements in cognitive aspects of writing, including focus, organisation, use of evidence, analysis, and counterclaims, alongside improvements in linguistic features such as grammar, vocabulary, sentence structure, spelling, punctuation, and capitalisation. The study highlights the pedagogical value of PF in strengthening both the cognitive and linguistic dimensions of argumentative writing, offering practical implications for enhancing writing instruction in secondary ESL classrooms.

Keywords: *ESL writing, peer feedback, argumentative writing, cognitive development, linguistic development*

Adolescents' Perceptions of Student-Teacher Relationships and Their Influence on Classroom Engagement: A Qualitative Narrative Inquiry Study in Secondary Schools in Malé, Maldives

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Teacher-student relationships (TSRs) have been extensively documented as a critical factor in adolescents' academic and socio-emotional development. However, qualitative understanding of how Maldivian secondary school students perceive these relationships and how such perceptions shape their classroom engagement remains limited. This research proposal outlines a qualitative narrative inquiry study examining adolescents lived experiences of TSRs in secondary schools in Malé, Maldives. Guided by an interpretivist paradigm and an inductive approach, the study employs narrative inquiry as its core research design. Data will be collected through semi-structured, narrative-oriented interviews with approximately five purposively selected adolescents aged 13 to 16. Analysis will follow a narrative analysis framework to identify themes and meanings within and across participants' stories. The proposed study contributes to an under-researched area of relational schooling in the Maldivian context, offering contextually grounded insights with direct implications for teacher professional development and school policy.

Keywords: *Student-Teacher Relationships, Student-Teacher Relationships, Secondary school, Perceptions, Narrative inquiry*

The Digital Competency Gap: Understanding Teacher and Student Capability for ICT Integration in Maldivian Primary Schools

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The integration of Information Communication Technology (ICT) into teaching has been a common term since the introduction of the new curriculum in the Maldives in 2015. With that, the digital competency of teachers and students is expected to be developed through the integrated teaching of ICT across other subjects. However, some educationalists argue that integrated teaching alone won't suffice the educational expectations. After a decade (2015 - 2025) of integrated teaching of ICT skills, still the claim is that both teachers and students lack sufficient digital skills as expected (ICT Master Plan 2, 2024). Therefore, it is vital to understand the effectiveness and challenges of this approach in developing digital competencies among teachers and students. The objective of this study was to examine the effectiveness and challenges of ICT-integrated teaching in developing digital competencies among teachers and students at Maldives primary school using the TPACK framework. This study employed a mixed-method convergent parallel design for data collection. Data collected through survey questionnaires and interviews with teachers (N = 23) and students (N = 43). Data revealed that most teachers and students lack basic digital skills and face numerous challenges (lack of basic digital skills, time pressures in preparation for ICT integrated lessons etc.). This includes limited capacity in troubleshooting classroom devices, applying good practices in word processing, creating interactive PPTs, and being unable to guide their students with the right techniques when needed. Therefore, this study recommends compulsory inclusion of specific lessons targeting for the development of ICT skills in both preservice teachers, in-service teachers and for students. Moreover, applying the TPACK framework for developing ICT integration skills in professional development (PD) and sessions on developing ICT skills to enhance teachers' digital capabilities could address the challenges.

Keywords: *Technology integration, ICT integration, Digital Capability, Curriculum implementation, Teacher Competency. Primary Teaching*

Finding Your Voice: A Reflective Case Study on the Impact of Toastmasters Peer Evaluation on Public Speaking Skills

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Communication skills are essential benchmarks for professional competency and success, yet many professionals struggle with public speaking anxiety. While traditional educational settings often lack safe spaces for developmental feedback, Toastmasters International offers an alternative environment that utilizes experiential learning to advance leadership and communication skills. This qualitative reflective study explores how participation in Toastmasters peer evaluation system influenced the public speaking skills of a nurse educator in the Maldives. Guided by a constructivist paradigm, the research employed an intrinsic reflective case study design. Data were triangulated from multiple sources, including reflective journals, speech manuscripts, structured peer evaluation forms, and documented milestones such as awards and certificates. The data were analysed using thematic analysis to identify key stages of development and learning throughout the researcher's three-year journey. Four central themes emerged from the data: (1) Motivation for joining the Toastmasters learning platform; (2) Learning through peer evaluation; (3) Developing public speaking confidence through repeated practice; and (4) Learning by providing feedback. The findings suggest that Toastmasters provide a psychologically safe experiential learning environment that facilitates personal and professional transformation. The structured "Commend-Recommend-Commend" evaluation system was the primary mechanism growth, shifting the researcher's perception of feedback from criticism to a valuable developmental tool. The findings of this study demonstrate that Toastmasters peer evaluation is a successful experiential learning method for developing reflective practitioners and confident communicators. Achievements such as receiving a "Best Presenter Award" at an International Conference, reflect the successful transferability of the communication skills learnt through Toastmasters.

Keywords: *Experiential learning, Peer evaluation, public speaking, Toastmasters International*

Navigating the Digital Shift: An Investigation into the Adoption and Integration of Generative AI in Teaching and Learning Law at The Maldives National University

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The rapid emergence and increasing reliance on Generative Artificial Intelligence (GenAI) tools in higher education, including legal education, has transformed contemporary teaching and learning practices. However, in the Maldives, there remains a notable lack of empirical evidence examining the extent and nature of GenAI use within academic settings. This study aims to investigate the adoption, usage patterns, and integration of GenAI tools in teaching and learning law at the The Maldives National University (MNU). A descriptive survey design was employed, utilising an online questionnaire administered to both academicians and students within the law discipline. A total of 32 responses were analysed, comprising 7 academicians and 25 students. The questionnaire assessed dimensions including the purposes of GenAI use, perceived efficiency, and ethical considerations surrounding its application in academic work. The findings indicate a high level of awareness and widespread use of GenAI tools among both students and academic staff. ChatGPT and Gemini emerged as the most used platforms. Students primarily reported using GenAI for explaining legal concepts and assisting with assignments, while academicians indicated use for research support, lesson planning, and content development. However, responses also reflected mixed perceptions regarding the ethical implications, accuracy, and reliability of these tools. A key concern identified across both groups was the absence of structured training and institutional guidance for the effective and responsible use of GenAI in legal education. Overall, the study highlights the growing integration of GenAI in legal education at MNU, while underscoring the need for clear institutional policies and targeted capacity-building initiatives to ensure its ethical and effective use in teaching and learning.

Keywords: *navigation, digital shift, generative AI*

Association between Generative AI Dependency, Critical Thinking Skills and Perceived Academic Stress among Undergraduate Students in Maldives

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Generative Artificial Intelligence tools are increasingly being used by university students to support academic tasks, including writing and research. While these technologies can enhance learning efficiency, concerns have been raised about their potential impact on students' critical thinking skills and academic stress. This study aims to examine the relationship between generative AI dependency, critical thinking skills, and perceived academic stress among undergraduate students in the Maldives, where research on this topic remains limited. A quantitative cross-sectional correlational design will be employed, involving approximately 300-350 undergraduate students from public and private universities. Data will be collected using standardized questionnaires measuring generative AI dependency, critical thinking, and perceived academic stress. The data will be analysed using descriptive statistics, bivariate correlation analysis to determine the relationships among the variables and multiple linear regression to examine whether generative AI dependency predicts critical thinking skills and perceived academic stress. The study is guided by the Cognitive Offloading Theory and Transactional Model of Stress, which suggest that excessive reliance on AI may reduce independent cognitive effort while also serving as a coping mechanism for academic pressures. The findings are expected to provide valuable insights into the educational and psychological implications of AI use among university students. Study will contribute to the limited body of research in the Maldivian context and may inform educators and policymakers on the effective and responsible integration of AI technologies in higher education. Research seeks to enhance understanding of how AI dependency relates to students' critical thinking abilities and academic stress.

Keywords: *Generative AI Dependency, Critical Thinking Skills, Perceived Academic Stress, Undergraduates, Maldives*

The Leadership Capabilities and Practices for Successful, Sustainable School Turn Around: A Conceptual Review

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In the Maldives, O-level results play a significant role in higher education and job opportunities. Besides, many Maldivian secondary students struggle to perform up to the expected level in O-level exams. To effectively address this nationwide concern, principals working in such contexts need to understand the leadership capabilities and practices they should employ to improve the school's performance to the expected level and sustain it. This conceptual review, therefore, examines the leadership capabilities and practices that could be employed to turn around and sustain school performance. The study synthesizes existing international literature on the turnaround phenomenon, primarily from the past 5 years, drawing on key leadership theories, including turnaround leadership theory and the context-responsive leadership model. As identified in the review, leadership capabilities such as being instruction-focused, resilient, data-driven, adaptive, and capable of driving rapid change are significant to school turnaround and its sustainability. As the review highlights, the principals need to prioritize instructional quality, practice data-driven decision-making, cater to individuals' needs, practice focused interventions, and lead school improvement efforts to achieve successful, sustainable school turnaround. Moreover, they need to adapt to contextual factors such as geographical, logistical, and systemic factors, and address the upcoming challenges, such as resource-related and systemic challenges, during the school turnaround process. The Key academic databases from which the literature was gathered include Google Scholar, ERIC, ScienceDirect, EBSCO, MNJR, etc. Based on the literature, the paper proposes a conceptual framework that links leadership capabilities and practices to successful school turnaround and sustainability. The framework also highlights the importance of addressing contextual factors and challenges. Thus, the study calls for further contextually grounded research to investigate the leadership capabilities and practices the Maldivian leaders need to employ to achieve successful school turnarounds and sustain them in the challenging Maldivian contexts.

Keywords: *Leadership capabilities, Leadership practices, Successful School turnaround, Contextual factors, Challenges*

Beyond Content Moderation: Social Media Platform Accountability in Addressing Digital Hate Speech in South Asia

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The emerging use of social media has transformed communication but has also facilitated the rapid spread of digital hate speech. Unlike traditional hate speech, digital hate speech is amplified by the speed, reach, anonymity and algorithmic features of online platforms, posing significant challenges to existing regulatory frameworks. The study aims to examine the distinctive nature of digital hate speech in selected South Asian countries and evaluate the evolving role and accountability of social media platforms in preventing and mitigating harmful online content. The study adopted a qualitative research approach employing semi-structured interviews with 10 participants representing different South Asian nationalities. Participants were selected using a convenience sampling technique to obtain diverse perspectives on the research topic. The interview data were analysed using thematic analysis to identify recurring themes and patterns relevant to the research objectives. The results show that, despite the comparative differences in the nature of digital hate speech across South Asian jurisdictions, religiously motivated hate speech emerges as a common phenomenon. However, the prevalence and forms of political, caste-based, and ethnic hate speech differ considerably, reflecting the distinct historical, cultural and political contexts of each country. The study further found an increasing reliance on cybercrime and criminal legislation to regulate online hate speech, coupled with growing expectations for social media platforms to play a proactive role in detecting, moderating and removing harmful content. Overall, despite the differences in cultural, political and legal landscapes, the common direction suggests an emerging consensus that effective regulation requires a balanced framework that protects fundamental rights and public safety.

Keywords: *Content Moderation, Platform Accountability, Social Media Platforms, Digital Hate Speech, Digital governance*

A Global Bibliometric Analysis on exploring the Growth of Critical Thinking in Undergraduate Calculus

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Critical thinking is fundamental to student success and retention in mathematics education. Yet, despite the strong pedagogical evidence, more than 85% of global institutional assessments on calculus exam focus on low-level procedural skills such as algebraic manipulation and memorized algorithms. This limits the opportunities of conceptual reasoning and problem-solving in undergraduate calculus, creating a significant gap between theory and classroom practice. This study aims to provide evidence-based analysis of how critical thinking in calculus represents in global mathematics research. A bibliometric analysis was conducted using peer reviewed publications indexed in Scopus database up to May 2026. The research examined 352 publications out of 455 as core volume for evaluating publication trends, lifecycle maturity and science mapping cluster. The analysis shows that research publications peaked in 2025 with 67 papers followed by 46 in 2020. Among Journals, journal of Physics recorded the highest number of publications (35) while, the most influential journal holding highest total citations is Nurse Education Today (387). The findings regarding lifecycle maturity reveals progress of transition from traditional curriculum to Innovative teaching approaches such as flipped classrooms, blended learning, and problem-based learning in peripheral journals. Furthermore, Science mapping revealed discipline specific clusters across fields of Engineering, Nursing higher education and STEM. This study provides mathematics researchers and educators evidence on evolving research trends in calculus in mathematics education, to interpret the research landscape, develop future agendas, and evaluate scholarly impact.

Keywords: *Critical Thinking, Calculus, Mathematics Education, Undergraduate, Bibliometric Analysis*

Student Perspectives on Arabic Language Modules in Maldivian Legal Education: A Quantitative Analysis

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Arabic modules remain a mandatory component of the LLB programmes at The Maldives National University (MNU), the Islamic University of Maldives (IUM), and Zikura International College; however, questions persist regarding their academic value, workload, and practical usefulness in legal education. From the perspective of undergraduate LLB students, this research examines how Arabic modules impact legal education by evaluating their overall academic relevance, workload, and practical utility. Data were collected via an online questionnaire distributed to undergraduate law students across these institutions, resulting in a sample of 19 respondents. The quantitative findings reveal a strong overall recognition of the value of Arabic coursework: 63.2% of respondents agreed or strongly agreed that skills learned in Arabic facilitate their understanding of Islamic law, while 57.9% reported that these modules enhance their ability to interpret legal texts and will prove useful in their future legal careers. Additionally, 52.6% affirmed the general relevance of Arabic modules to their legal studies, and 57.9% perceived assessment methods as fair and transparent. Regarding enrolment choices, 47.4% were not discouraged from applying to the LLB programme due to the compulsory Arabic requirement, though 26.3% noted initial hesitation driven by language difficulty and time commitment. The findings show students broadly recognize the pedagogical value of Arabic modules for legal texts and Islamic jurisprudence. However, with 47.4% preferring fewer Arabic modules due to workload and difficulty, the programme structure necessitates targeted curriculum reform. Streamlining course delivery and emphasizing practical legal terminology will ensure the programme remains academically rigorous, relevant, and supportive of student success.

Keywords: *Legal Education, Mandatory Arabic Language, LLB Curriculum Reform, Islamic Law, Student Perceptions*

Prototyping a Grade 3 Dhivehi Reading Comprehension Routine: A Mixed Methods Design-Based Research in a Maldivian Classroom

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The widespread adoption of English-Medium Instruction in the Maldives has long created a subtractive bilingual environment. This crisis is further compounded by a pedagogical void; Dhivehi teachers lack contextualised scaffolds to teach higher-order comprehension skills. Consequently, national assessments reveal a decade long decline, with 60% of students failing to meet the minimum Dhivehi proficiency thresholds. While recent initiatives have begun developing Dhivehi reading materials for lower primary students, texts alone cannot ensure comprehension without explicit instruction. Addressing this gap, this study partners with 4 to 5 Grade 3 teachers and approximately 90 students at a Maldivian primary school to co-design and refine a Dhivehi reading comprehension routine. This routine operationalises the Gradual Release of Responsibility model, providing teachers with a pedagogical toolkit centred on schema activation, explicit strategy instruction, and collaborative dialogue to target inferential reasoning. Using a mixed methods Design-Based Research approach with conjecture mapping, the study unfolds in three phases: (1) baseline data collection; (2) two iterative cycles of prototype design, implementation and refinement; (3) final evaluation of the scaffolds within the routine. To ensure scientific rigor, the study employs methodological triangulation. Quantitative pre-and post-assessments are cross-referenced with qualitative classroom observations, video-recorded lessons, and teacher interviews. This research anticipates that co-constructing scaffolds with teachers will improve students' inferential reasoning and transform instructional practices. Ultimately this study will generate transferable design principles and a sustainable pedagogical framework, equipping educators and policymakers with evidence-based tools to build resilience against language marginalisation.

Keywords: *Dhivehi Reading Comprehension, Design-Based Research, Inferential Reasoning, Subtractive Bilingualism, Pedagogical Scaffolding*

Exploring Teachers' Perception on The Influence of Formative Feedback on Maldivian Secondary Students' Academic Success

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Formative feedback plays a key role in monitoring and tracking teaching and learning (Van Der Steen et al., 2023). It is claimed to promote learner-centred teaching where students are more engaged and highly motivated to learn when they are continuously informed about the learning progress (Yang et al., 2021). Underpinned by the Self-Determination Theory, SDT (by Ryan & Deci, (2020), this study aims to explore the perceptions of teachers on how formative feedback influences Maldivian secondary students' academic success. Qualitative research design was adopted to collect interview data and document artefacts from secondary grade teachers using purposive sampling techniques. The six steps of the thematic analysis proposed by Braun and Clarke (2006) was used to analyse the data. The findings revealed five key themes highlighting teachers' awareness of feedback and its importance as a tool for enhancing learner engagement and motivation. The findings also identified several barriers that limit teachers' ability to provide effective feedback, alongside contextual factors that contribute to the successful implementation of feedback practices. These findings underscore that effective feedback plays a significant role in assisting learners achieve the intended learning outcomes. The study has several important implications, including the adoption of peer feedback approaches in classrooms and the development of a school culture that supports formative feedback practices. Recommendations also extend to parents, particularly in encouraging students to actively monitor and take ownership of their own learning.

Keywords: *Formative Feedback, Motivation, Learner-centred, Time constraints, Contextual factors*

Artificial Intelligence Tools, Digital Literacy, and Student Self-Efficacy in Higher Education: A Bibliometric Analysis and Systematic Literature Review

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This study maps the global knowledge base on artificial intelligence (AI) tools, digital literacy, and student self-efficacy in higher education and systematically synthesizes the evidence reported in the relevant student-focused literature. Design/methodology/approach: A bibliometric analysis examined 544 English-language journal articles indexed in Scopus for 2005–2025 and retrieved on 29 June 2026. Scopus analytical outputs, Microsoft Excel, and VOSviewer were used for performance and science-mapping analyses. A systematic literature review (SLR) was concurrently conducted following PRISMA guidelines; after applying strict inclusion and exclusion criteria during title, abstract, and keyword screening, 344 higher-education student-focused studies were retained for systematic thematic synthesis. Findings: The literature was limited until 2020 but grew rapidly after 2023; 374 articles (68.8%) were published in 2025. China, the United States, Taiwan, Malaysia, and Hong Kong were the leading contributors. Social Sciences and Computer Science dominated the field, while collaboration centred on China and the United States. The systematic synthesis indicates that AI-supported learning, feedback, and guided prompting can strengthen confidence, self-efficacy, motivation, information literacy, and selected academic outcomes. However, the evidence also identifies risks related to AI anxiety, academic integrity, misinformation, and dependency. AI literacy, self-efficacy, perceived usefulness, instructional scaffolding, and institutional support consistently emerged as important conditions for responsible adoption. Research limitations/implications: The study was limited to Scopus-indexed English-language journal articles and a metadata-based thematic synthesis; it did not include a formal risk-of-bias assessment. Originality/value: By integrating bibliometric mapping with a systematic literature review, the study connects the field's performance and network structure with the substantive evidence, research gaps, and implications for higher education policy and practice.

Keyword: *artificial intelligence in higher education, digital literacy, self-efficacy, bibliometric analysis, systematic literature review*

Knowledge, Attitude and Practice of Self-Medication Among Students Enrolled in Universities in the Greater Male' Area in January-February of 2026

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Self-medication is practiced globally and is a rising public health concern. Despite the easy availability of over-the-counter medications in Maldives, to the best of our knowledge, there has been no published studies on practices of self-medication in Maldives. This cross-sectional study was conducted amongst university students studying in the Greater Male' Area. The data was collected using a pre-designed, validated, structured questionnaire. Cochran's formula was used to reach a sample size of 340 which was allocated to universities based on its proportion of students. Students were approached via convenience sampling until the predetermined quota was met. After removing 41 incomplete responses, the final analysis included 333. The statistical analysis was performed using SPSS, Independent t-test, Chi square and One-way Anova. The prevalence of self-medication among our study population was 88.3%. 67.9% of students had good knowledge about self-medication. Despite a majority of participants (99.7%) having a positive attitude towards self-medication, (87.7%) had irresponsible practices. A statistically significant correlation was found between knowledge and attitude scores ($r=0.282$, $p=0.00000016$), and between attitude and practice scores ($r=0.185$, $p=0.00068$). Gender and field of study significantly influenced attitude, while age was the only factor significantly associated with self-medication practices. Overall, the attitude affects self-medication practices more than knowledge, emphasizing the need for targeted interventions that cultivate responsible attitudes and safe practices to ensure rational self-medication practices.

Keywords: *Self-medication, Knowledge, Practices, Attitude, University students*

Sub-theme 6: Gender, Equity, and Social Transformation

24 Abstracts



Beyond Fish Trading: Gender-Transformative Pathways to Climate Resilience for Women Farmers in Ondo State, Nigeria

Paul Awoniyi
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Abstract

This study examines how gender-transformative approaches can enable saltwater-affected women in coastal Ondo State, Nigeria, to move from survival strategies to climate resilience and economic leadership. It investigates how climate-induced saltwater intrusion since the early 2000s has devastated women's freshwater swamp rice farming, a livelihood that women dominated for over three generations. Unlike sudden disasters, this gradual encroachment has forced women into fish trading, a shift this study conceptualizes as adaptive degradation: women purchase catch from male fishermen and sell in local markets, earning lower incomes with no control over production, pricing, or quality. While trading provides immediate survival, it eliminates the productive autonomy women exercised in farming. Drawing on feminist political ecology, we distinguish gender-responsive adaptation (improving conditions within existing structures) from gender-transformative adaptation (restructuring power relations constraining women's agency). This qualitative study employed 42 interviews with women farmers, eight focus group discussions, 12 interviews with male fishermen and community leaders, and participant observation across five communities. Findings reveal stark intersectional stratification: younger, educated women accessed fish trading, while older women faced complete livelihood collapse. Critically, no women reported consultation in water management or adaptation planning. We argue for pathways targeting strategic gender interests: positioning women as knowledge brokers for salt-tolerant rice to circumvent male-dominated extension; adapting FAO's FTT ovens for women-controlled processing; establishing collective land-leasing bypassing individual tenure barriers; and mandating quotas with decision-making authority in water user associations. This research demonstrates that resilience requires restructuring institutions and power relations constraining women's economic independence.

Keywords: *gender-transformative adaptation, feminist political ecology, adaptive degradation, saltwater intrusion, livelihood collapse*

Towards Collaborative Mental Health Frameworks: Feminist and Cultural Perspectives from India and The Maldives

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The globalization of mental health discourse highlights the need for culturally grounded and contextsensitive frameworks, particularly within the Global South. This study analyzes how feminist and cultural perspectives inform interdisciplinary understandings of mental health in India and the Maldives, with attention to gendered and community-based experiences. Using a qualitative, systematic review-based methodology, this paper critically examines peer-reviewed literature and interdisciplinary sources drawn from feminist theory, cultural studies, and global mental health research. Literature was selected through targeted searches in academic databases, focusing on studies published between [insert relevant years if known] that engage with gender, culture, language, and community-centered practices in non-Western contexts. Thematic analysis was employed to identify recurring frameworks, conceptual overlaps, and critical gaps within existing models. The analysis identified four central findings. First, dominant Western psychiatric models inadequately capture culturally embedded and gendered experiences of mental health. Second, women's mental health in both India and the Maldives is deeply shaped by socio-cultural norms, familial structures, and local belief systems. Third, indigenous knowledge systems and community-based practices play a critical yet underrepresented role in mental health support. Finally, the dominance of English in academic discourse restricts articulation of culturally specific experiences and sustained South–South collaboration. The paper culminates in a proposed collaborative framework that emphasizes interdisciplinary approaches, equitable knowledge exchange, and culturally responsive practices between India and the Maldives. This model contributes to more inclusive and contextually grounded feminist mental health research and practice.

Keywords: *Mental Health, Feminism, Cultural Translation, Global South, Interdisciplinary Research*

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ތަންތަނުގެ ދާއިރާތަކުގައި (ދާއިރާ) ތަންތަނުގެ ކަންކަމުގައި ކުރިއަރުވާ ދާއިރާ (ތަންތަނުގެ ކަންކަމުގައި ދާއިރާ) ތަންތަނުގެ ކަންކަމުގައި ދާއިރާ ތަންތަނުގެ ކަންކަމުގައި ދާއިރާ

ދ ތަކެއްގެ ގޮތުގައި، ތަންތަނުގެ ކަންކަމުގައި ދާއިރާ

مُخْرجات التَّعلم في برنامج بكالوريوس اللّغة العربية بجامعة الماليديف الإسلامية بيْن الصياغة الأكاديمية والواقع التطبيقي: دراسة تحليلية ميدانية

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IUM

يتناول هذا البحث مخرجات التعلم في برنامج بكالوريوس اللغة العربية بجامعة الماليديف الإسلامية، من خلال دراسة العلاقة بين الصياغة الأكاديمية لمخرجات التعلم في وثائق البرنامج والمقررات الدراسية، وبين مستوى تحققها الواقعي لدى الطلبة والخريجين في الجوانب المعرفية والمهارية والسلوكية. وتنبع أهمية الدراسة من التحولات المعاصرة في التعليم العالي التي جعلت مخرجات التعلم محورًا أساسيًا في تقويم جودة البرامج الأكاديمية والاعتماد المؤسسي، خاصة في برامج تعليم اللغة العربية في البيئات غير الناطقة بها.

مشكلة البحث: تتمثل في وجود تساؤلات حول مدى الاتساق بين مخرجات التعلم المعلنة في برنامج بكالوريوس اللغة العربية بجامعة الماليديف الإسلامية وبين مستوى تحققها الفعلي في الواقع التطبيقي، في ظل التحديات المرتبطة ببيئة تعلم العربية بوصفها لغة ثانية، وتفاوت مستويات الأداء اللغوي والمهاري لدى الطلبة والخريجين.

سؤال المشكلة الرئيس: إلى أي مدى تتحقق مخرجات التعلم في برنامج بكالوريوس اللغة العربية بجامعة الماليديف الإسلامية في الواقع المعرفي والمهاري والسلوكي لدى الطلبة والخريجين؟

أهداف البحث:

- تحليل مخرجات التعلم المعتمدة في برنامج بكالوريوس اللغة العربية.
- قياس مستوى تحقق المخرجات المعرفية والمهارية والسلوكية لدى الطلبة والخريجين.
- الكشف عن الفجوة بين المخرجات المستهدفة والمتحققة فعليًا.
- تحديد أبرز العوامل المؤثرة في تحقق مخرجات التعلم.
- تقديم تصور تطويري يسهم في تعزيز جودة البرنامج وتحسين مخرجاته.

المنهج:

اعتمدت الدراسة على المنهج المختلط (Mixed Methods)، من خلال تحليل وثائق البرنامج، وإجراء مقابلات شبه مقننة، وتطبيق اختبارات أدائية وملاحظة أكاديمية. كما استخدمت منهج دراسة الحالة باعتبار البرنامج نموذجًا أكاديميًا في بيئة غير عربية، مع توظيف التحليل الموضوعي (Thematic Analysis) في معالجة البيانات النوعية.

النتائج المتوقعة:

يتوقع البحث وجود تباين بين المخرجات المعلنة والمتحققة، مع تحقق الجانب المعرفي بدرجة أعلى من الجوانب المهارية والتطبيقية، إضافة إلى تأثير البيئة اللغوية غير العربية في مستوى الأداء التواصلي والكتابي لدى الطلبة. كما يتوقع أن تؤكد الدراسة أهمية تطوير أساليب التقويم، وتعزيز الممارسات التطبيقية، وربط المقررات الدراسية بمهارات الأداء اللغوي الواقعي.

الكلمات المفتاحية: مخرجات التعلم – اللغة العربية – التعليم العالي – الجودة الأكاديمية – تعليم العربية لغير الناطقين بها.

إطار تطبيقي قائم على الذكاء الاصطناعي لتوظيف الصرف الوظيفي في تنمية الكفاية التداولية بجزر المالديف

السيد جوده
The Arab Islamic School

الملخصمشكلة الدراسة: يواجه متعلمو اللغة العربية الناطقون باللغة الديفيهية في جزر المالديف عموماً قصوراً حاداً في المهارات الإنتاجية (التحدث والكتابة)، يتمثل في الضعف الشديد في توليد الصيغ الاشتقاقية تلقائياً وسياقياً أثناء التواصل ،رغم استيعابهم النظري للقواعد. وقد تبلورت مشكلة الدراسة ميدانياً في رصد هذا الضعف وتوصيفه لدى طلاب المرحلة الثانوية بالمدرسة العربية الإسلامية في العاصمة ماليه؛ حيث تتحدد فجوة البحث في الحاجة إلى الانتقال من الأطر النظرية نحو تقديم نموذج إجرائي تطبيقي واضح يوظف التقنيات الذكية لإنتاج الكلام والكتابة بشكل صحيح تداولياً وسياقياً لدى هذه الفئة.أهداف الدراسة: هدفت الدراسة إلى بناء إطار تطبيقي متكامل يتكون من: (1) مصفوفة للأوزان الصرفية الوظيفية الموجهة لخدمة أفعال الكلام الأساسية للمتعلمين في جزر المالديف، (2) هندسة واختبار قوالب أوامر تفاعلية موجهة للنماذج اللغوية الكبيرة لتقديم تغذية راجعة صرفية فورية، (3) تصميم المخطط الهيكلي التقني لبيئة تعلم ذكية تدمج أدوات معالجة اللغة العربية مع المحركات التوليدية كنموذج قابل للتنفيذ المباشر.منهجية الدراسة: اتبعَت الدراسة المنهج التطبيقي؛ فترتكز المنهجية أولاً على تحليل عينة استكشافية من (30) نصاً كتابياً من الإنتاج اللغوي لطلاب المرحلة الثانوية في المدرسة العربية الإسلامية بالعاصمة ماليه، لتصنيف الأخطاء الاشتقاقية كمياً ونوعياً والوقوف على طبيعتها الحقيقية. ثانياً، بناء مصفوفة الصرف الوظيفي وتحكيمها من قبل (7) خبراء في التربية اللغوية واللسانيات الحاسوبية. ثالثاً، النمذجة التقنية للبيئة عبر هندسة توجيهات النظام واختبار كفاءتها برمجياً بواسطة واجهات التطبيقات بالاتصال مع أدوات التحليل الصرفي الآلي والإشراف البشري، لضمان دقة المعالجة ومنع الهلوسة الرقمية وتوليد نمط تغذية راجعة فوري ملائم تربوياً.نتائج الدراسة: خلصت الدراسة إلى مجموعة من النتائج البحثية التطبيقية، أبرزها: وجود تلازم طردي بين نمو الوعي بالوزن الصرفي والقدرة على الإنتاج التداولي السليم لدى طلاب المدرسة العربية الإسلامية. كما أسفر البحث عن تقديم مخرجات إجرائية متمثلة في: مصفوفة مقننة للأوزان الصرفية الوظيفية المرتبطة بالسياق الثقافي والاتصالي للمتعلمين في جزر المالديف، ودليل إجرائي ومخططات لتدفق البيانات لبناء المنصة الذكية، بالإضافة إلى بنك يحتوي على قوالب الأوامر المختبرة والمقيدة تربوياً ولغوياً؛ مما يضع للمؤسسات الأكاديمية المستهدفة في جزر المالديف خارطة طريق تقنية وتنفيذية متكاملة لرفع كفاءة مهارات التحدث والكتابة بنسب فاعلية مرتفعة قابلة للقياس التجريبي.

الكلمات المفتاحية: الصرف الوظيفي، الكفاية التداولية، الذكاء الاصطناعي التوليدي، تعليم العربية للناطقين بغيرها، جزر المالديف

Beyond Representation: Understanding What Makes Feminist Reforms Work

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Across jurisdictions, feminist reforms have expanded women's inclusion through legal reforms, policy interventions, gender quotas, and institutional commitments to equality. While these initiatives often increase formal representation and legal recognition, they do not consistently translate into substantive equality outcomes. This challenge is particularly visible in small-state and developing democratic contexts, where institutional capacity constraints, social norms, and political dynamics shape implementation in ways that can limit reform effectiveness. This conceptual paper argues that implementation remains an underexamined dimension of feminist governance and introduces the concept of Feminist Implementation Ecosystems as a framework for understanding the conditions required for feminist reforms to achieve meaningful outcomes in practice. Drawing on feminist governance scholarship, implementation studies, and governance reform practice, the paper adopts an inductive conceptual approach to examine why reforms that appear inclusive in design often fail in implementation. The framework emerged through reflection on recurring implementation challenges observed across governance reform initiatives and was refined through engagement with relevant scholarships. This process identified six interconnected pillars shaping implementation outcomes: participatory design, institutional readiness, political support structures, social legitimacy, accessibility and safety mechanisms, and accountability and monitoring processes. Rather than treating implementation as a technical stage following legal adoption, the framework conceptualizes it as an ecosystem in which institutional, political, and social conditions interact to shape reform outcomes. Using women's political participation as an illustrative example, the paper demonstrates how reforms may generate symbolic gains without producing substantive transformation when implementation conditions are overlooked. The paper contributes to debates on inclusive governance, feminist innovation, and social transformation by proposing Feminist Implementation Ecosystems as an analytical lens for assessing reform readiness beyond legal adoption and advancing substantive equality outcomes.

Keywords: *Feminist Governance, Inclusive Governance, Policy Implementation, Substantive Equality, Gender Equality*

Exploring attitudes towards Englishes in the Maldives: Insights from the Corpus of Spoken Maldivian English (CoSpoMalE)

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Abstract

The nature of English around the world is a pluricentric one. Researchers within the World Englishes paradigm have been primarily concerned with the description and modelling of postcolonial Englishes. Yet, to date, they have largely neglected non-postcolonial settings like the Maldives where Maldivian English can be viewed as an emerging, unique variety of English under the influence of L1 Dhivehi within the rich cultural environment of the Maldives. The present study attempts to address this gap by presenting insights from the Corpus of Spoken Maldivian English (CoSpoMalE) concerning 1) speaker perceptions of Maldivian English as a variety in its own right and 2) attitudes towards this variety as well as vis-à-vis other World English varieties. Drawing on a subset of the sociobiographical data of the corpus, which was collected from 242 Maldivian English speakers in October 2025 and February/March 2026 via sociolinguistic surveys and recorded dyadic interviews, our initial results point to a discernible awareness of Maldivian English as a mostly positively connotated variety, despite the persistence of unfavourable attitudes in particular in comparison to other varieties. Furthermore, the findings are in line with the previously attested observations of a language shift occurring among Maldivian youth and frequent code-switching, which have implications not only for language teaching in the Maldives, but also for the development of and status attributed to Maldivian English.

Keywords: *World Englishes, Maldivian English, Language Attitudes, Corpus Linguistics, Sociolinguistics*

Pathways for Gender-Responsive Budgeting: Strengthening Systems for Addressing Gender-Based Violence in Odisha, India

SrabaniDas

Gender-based violence (GBV) remains a significant public health and human rights concern in India, with far-reaching consequences for health, wellbeing, and social development. This paper examines the burden of GBV, reporting patterns, and institutional response mechanisms in Odisha, and explores the role of Gender-Responsive Budgeting (GRB) in strengthening systems for prevention, protection, and survivor support. A descriptive secondary analysis was conducted using data from the National Family Health Survey-5 (2020–21), administrative records from One Stop Centres (OSCs), and the Odisha Gender Budget Statement (2025–26). Quantitative data were analysed to assess GBV prevalence, reporting trends, and service utilization, while policy and budget documents were reviewed to identify financing, implementation, and accountability gaps. Findings were synthesized to assess the alignment between GBV burden and public investment. The analysis reveals a substantial disparity between estimated GBV prevalence among ever-married women (29%) and formal reporting through OSCs (0.31%). Help-seeking remains low (11–12%), reflecting stigma, limited awareness, and barriers to accessing services. Although Odisha has established policy frameworks and institutional mechanisms for GBV response, challenges persist in data integration, provider capacity, medico-legal service delivery, monitoring systems, and inter-sectoral coordination. The paper highlights that GRB should be viewed not merely as a budgeting tool but as a governance approach linking financing with measurable gender equality outcomes. Strengthening gender-responsive financing, integrated monitoring systems, and evidence-based decision-making can enhance GBV interventions and contribute to achieving SDGs 5, 10, 16, and 17. Odisha's experience offers lessons for advancing inclusive governance and sustainable development.

Keywords: *Gender-Responsive Budgeting, Gender-Based Violence, Health Systems, Odisha, Sustainable Development Goals*

نظرية العامل في النحو العربي: من الإعراب إلى التمثيل الذهني – دراسة تطبيقية في المدرسة العربية بجزر المالديف

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الملخصمشكلة الدراسة: يعاني متعلمو اللغة العربية الناطقون باللغة الديفيهية في جزر المالديف من فجوة واضحة بين معرفتهم الإعرابية الظاهرة وقدرتهم على التمثيل الذهني للعامل النحوي، مما ينعكس سلباً على أدائهم اللغوي الإنتاجي. وتتحدد مشكلة الدراسة في الحاجة إلى تشخيص مواطن الضعف النحوي لدى هذه الفئة، وقياس أثر توظيف استراتيجيات لسانية معرفية في تنمية قدراتهم على التمثيل الذهني للعامل النحوي، بما ينعكس إيجاباً على تحصيلهم اللغوي وإنتاجهم التركيبي.أهداف الدراسة: هدفت الدراسة إلى: (1) استقصاء وتشخيص مواطن الضعف النحوي لدى متعلمي العربية في جزر المالديف، (2) قياس مدى تطور الأداء اللغوي والتحصيل التعليمي لدى الطلاب عند توظيف استراتيجيات معرفية تساعدهم على تذوق البنية التركيبية، (3) تقديم نموذج تطبيقي لتدريس النحو يركز على التمثيل الذهني للعامل بدلاً من الحفظ الآلي للإعراب.منهجية الدراسة: اعتمدت الدراسة على المنهج الوصفي التحليلي لتحديد وتصنيف مظاهر الضعف النحوي، مدمجاً بالمنهج شبه التجريبي (تصميم المجموعة الواحدة بقياس قبلي وبعدي). واتخذت من المدرسة العربية بالعاصمة ماليه ميداناً للتطبيق، حيث شملت العينة (40) طالباً وطالبة من المرحلة الثانوية (الصف العاشر). واستُخدمت حزمة أدوات متمركزة حول المتعلم شملت: اختبارات قبلية وبعدية، وبروتوكولات التفكير بصوت عالٍ، وتحليل الأخطاء التحريرية والشفهية للطلاب.نتائج الدراسة: خلصت الدراسة إلى مجموعة من النتائج التطبيقية، أبرزها: أن الضعف النحوي الأساسي يعود إلى عجز إدراكي في استحضار العلاقات البنيوية بين العوامل والمعمولات ذهنياً، وليس في حفظ حركات الإعراب السطحية. وأسفر تحليل الأخطاء عن حصر معوقات الإنتاج في الخلط بين الرتب التركيبية (كتقديم الخبر وجوباً أو رفع المنصوبات). في حين أظهرت الاختبارات البعدية طفرة في أداء الطلاب الذين استوعبوا التمثيل الذهني للعامل؛ حيث ارتفعت قدرتهم على بناء جمل صحيحة ذاتياً بنسبة تجاوزت 40%. كما أثبتت بروتوكولات التفكير بصوت عالٍ أن بناء التمثيل الذهني يحرر المتعلم المالديفي من جمود الحفظ الآلي ويمنحه قدرة على الإدارة الذاتية لأخطائه وتصويبها تلقائياً داخل السياق.التوصيات: 1. إعادة صياغة المناهج النحوية بالمدرسة العربية لتنطلق من "العلاقات البنيوية والوظيفية للعامل" وربطها بالإنتاج اللغوي المباشر (المحادثة والكتابة). 2. تدريب معلمي العربية في المالديف على استراتيجيات اللسانيات المعرفية، والابتعاد عن أسئلة الإعراب النمطية التي تقيس الحفظ الجاف

الكلمات المفتاحية: نظرية العامل، التمثيل الذهني، النحو العربي، تعليم العربية للناطقين بغيرها، جزر المالديف

The Role of Perceived Symbolic Meanings in Shaping Green Clothing Attitudes Among Generation Z in Colombo, Sri Lanka

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The global clothing industry emits 8-10% of global carbon emissions, yet consumer adoption of green clothing remains low. This study examines the effect of perceived symbolic meanings on the attitudes of Generation Z consumers towards green clothing in the Colombo district, which has not been explored much in the literature of sustainable fashion. Based on the Theory of Consumption Value and centred on four symbolic dimensions, namely: status, environmentalism, innovation, and fashion, which were used to predict consumers' attitudes towards green clothing. The research design employed was quantitative and used a purposive sampling technique to obtain 284 valid responses from Generation Z consumers through an online questionnaire. The data was analysed using multiple regression analysis. The results showed that status, environmentalism and innovation symbols significantly positively affect the attitude towards green clothing. The fashion symbol, on the other hand, has a negative influence, suggesting that the word "fashion" implies rapid change and trend-driven purchasing, which does not align with the concept of sustainability behind green clothing. This indicates that the Generation Z consumers in Colombo are not ready to accept green clothing as a new fashion trend, but rather an alternative to conventional clothing. The results have marketing consequences, because it is better to position green clothing around the responsibility associated with the environment, social status, and credentials of innovation, than to position it as fashion. This research is an important addition to the limited research in the South Asian markets on sustainable consumption and gives a nuanced ground for green marketing strategy.

Keywords: *Consumer Attitudes, Generation Z, Green clothing, Perceived symbolic meanings, Sustainable fashion*

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Caregiver Burden and Perceived Need for Psychiatric Rehabilitation and Community Reintegration Services in the Maldives

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Individuals with severe mental illness often rely heavily on family caregivers for daily support, supervision, and treatment adherence, particularly in the Maldives, where the lack of step-down and community rehabilitation services places greater caregiving responsibilities on families. This study will assess caregiver burden and caregivers' perceived need for rehabilitation and reintegration services. A quantitative cross-sectional study will be conducted among primary caregivers of psychiatric inpatients admitted to the National Centre for Mental Health (NCMH), Maldives. Participants will be recruited using consecutive sampling. Caregiver burden will be assessed using the Zarit Burden Interview (ZBI-22). A researcher-developed, Likert-scale questionnaire will be used to assess caregivers' perceived need for psychiatric rehabilitation and community reintegration services. The instrument will undergo expert validation and pilot testing before data collection. Prior to completing this section, participants will be provided with a brief standardized description of rehabilitation services commonly available internationally. Descriptive statistics will summarize caregiver and patient characteristics, caregiver burden, and perceived rehabilitation needs. Correlations between caregiver burden and perceived rehabilitation needs will be examined using Pearson's or Spearman's correlation coefficients. Associations between caregiver burden and selected caregiver and patient characteristics will be assessed using appropriate statistical tests. The study is expected to identify substantial caregiver burden and unmet rehabilitation needs. Findings will provide local evidence to support the development of psychiatric rehabilitation and community-based services that promote recovery, facilitate community reintegration, and reduce caregiver burden in the Maldives.

Keywords: *Caregiver burden, Severe Mental illness, Psychiatric rehabilitation, Community reintegration, Maldives*

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Perspectives on Virtual Influencers: Insights from Female Social Media Users

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In the age of AI, computer generated Virtual influencers (Vis) are active as potential new age endorsers. VIs is a combination of carefully crafted visual and textual cues designed to appeal to users and shape their perceptions. Drawing upon the Source credibility theory, this study aims to explore how virtual influencers are perceived as contemporary endorsers in digital environments, particularly to female social media users, who are most active segment on social media. This study adopts a qualitative approach. A total of 30 female Instagram users, aged between 18 to 32 years consented to participate, and the responses were audio recorded. A thematic analysis was performed based on repetitive patterns to derive meaning and themes from the collected data (Braun and Clark, 2006). The findings provide valuable insights into female social media users' perception of VI, with revelations of physical appearance, demographic cues, digital engagement tactics, and voice on VI diversity, as overarching themes that affect virtual endorser relevance for them. The identified themes challenge stereotypes of mainstream advertising and provide vital suggestions to brands that can enhance the effectiveness of their digital advertising through such themes. Influencer marketing strategies that reflect cultural diversity and inclusivity can help foster stronger connections with female consumers online. The study enriches the understanding of the VI phenomenon, offering valuable insights for creators and brands to effectively use VI in online marketing strategies.

Keywords: *Virtual Influencers, Source Credibility, Influencer Marketing, Qualitative Marketing, In-depth Interviews*

Public Sector Service Delivery for the Deaf Community: A Mixed-Methods Study of Accessibility, Inclusion, and Communication Effectiveness in the Maldives

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This study aims to examine how public sector service delivery practices influence accessibility and inclusion for the Deaf community, with a particular focus on the mediating role of communication effectiveness. Despite growing global attention to inclusive development, individuals with hearing impairments continue to face barriers in accessing essential public services due to communication challenges and limited institutional preparedness. The study is grounded in the Social Model of Disability and Communication Accommodation Theory, which emphasize that accessibility barriers arise from institutional and communicative practices rather than individual impairments. An exploratory sequential mixed-methods design is adopted. The qualitative phase involves semi-structured interviews with Deaf individuals to explore lived experiences and identify barriers to public service access. Insights from this phase inform the development of a structured questionnaire administered to public sector service providers in the quantitative phase. Mediation analysis will be employed to examine the relationships among service delivery practices, communication effectiveness, and accessibility and inclusion. By integrating the Social Model of Disability and Communication Accommodation Theory within an exploratory sequential mixed-methods framework, the study offers a novel understanding of how communication effectiveness mediates the relationship between public service delivery practices and the accessibility and inclusion of the Deaf community. The findings are expected to inform communication strategies, policy interventions, and training initiatives aimed at improving inclusive service provision and promoting the meaningful social participation of Deaf individuals.

Keywords: *Deaf Community, Public Service Delivery, Communication Effectiveness, Accessibility and Inclusion*

Atoll-level Population Consolidation and Service Access: Spatial Patterns and Socioeconomic Impacts of Maldives

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This study examines atoll-level population consolidation and service access in the Republic of Maldives, analysing spatial patterns and socioeconomic impacts across 186 inhabited islands using 2022 census data and council budget records. Employing scatter plots, correlation analysis, and linear regressions, the paper documents strong positive relationships between island population, land area, and council budget allocation. Land area correlates moderately with population, and with budgets, indicating scale advantages for larger islands. Conversely, social outcome indicators display weak or negligible associations with population size: overall unemployment, youth unemployment, dependency ratio, elderly share, and NEET rates show minimal explanatory power from population alone. A moderate positive correlation appears between population and proportions outside the labour force and between population and higher-education attainment. These findings suggest that while consolidation concentrates fiscal resources and infrastructure in larger islands, population concentration is not a primary determinant of labour-market or demographic outcomes—other factors (economic structure, access to services, migration dynamics) are critical. Policy implications include adopting nuanced, formula-based budget allocation that accounts for density, service costs, and vulnerability; targeted job-creation and skills programs for youth; and tailored social services for aging and dependent populations. Future research should combine spatial accessibility metrics and qualitative case studies to guide equitable consolidation and service-delivery strategies.

Keywords: *population consolidation, service access, spatial inequality, geographical dispersion, sustainable development*

A Literature-Informed Conceptual Framework for Community Inclusion of Adults with Disabilities in the Maldives

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Inclusion of adults with disabilities in the community is one of the major goals of global rights-based and development-oriented frameworks. Despite advances in disability-inclusive policies, there remains a lack of integration of lived experiences, structural barriers, and enabling factors into a coherent conceptual understanding of community inclusion. This gap is particularly evident in Small Island Developing States, such as the Maldives where geographic dispersion, resource constraints and inequalities in access to services can further influence inclusion outcomes. This study aims to develop a literature informed conceptual framework to understand the lived experiences of community inclusion among adults with disabilities in the Maldives. A qualitative, literature-informed conceptual analysis was undertaken by reviewing peer-reviewed studies and relevant policy documents on disability and community inclusion. The analysis identified four interconnected conceptual domains: (1) lived experiences of community inclusion, (2) structural and environmental barriers, (3) enablers of participation and inclusion, and (4) policy and system-level influences. Together, these domains demonstrate how community inclusion is experienced, interpreted, and shaped through the interaction of individual agency, social relationships, community environments, and institutional structures. The resulting framework provides a conceptual lens for understanding the lived experiences of community inclusion among adults with disabilities. It offers a foundation for future qualitative research, including interview tool development and empirical exploration of lived experiences in the Maldivian context.

Keywords: *community inclusion, disability, conceptual framework, Maldives, lived experience*

Fair Splits, Fair Futures: Post Marital Economic Jus7ce for Women in the Maldives

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Twenty-five years since codification, family law in the Maldives do not address the challenges to ensure true economic equality for women after divorce. With one of the world's highest divorce rates, economic equality for women remains highly challenging, and many women face severe structural vulnerabilities, including unequal property division, lack of guaranteed spousal maintenance, and heavy unpaid care burdens that hinder labour force re-entry. This paper evaluates how Maldivian family law, Islamic Sharia jurisprudence, and sociocultural norms intersect to shape post-divorce financial disparities. Using a doctrinal methodology, it conducts a critical review of statutory law and recent court decisions to analyse judicial application and ongoing legislative struggles. The findings indicate that while recent Supreme Court rulings and legal amendments have provided pathways for reclaiming marital expenses and property, structural barriers—such as unequal asset and property ownership, high rates of unemployment, and the disproportionate burden of childcare—leave many divorced women highly vulnerable to poverty. This paper concludes by advocating for more robust enforcement mechanisms in matrimonial asset distribution, targeted state support, and accessible legal aid to empower divorced women and secure their long-term economic independence in the Maldives.

Keywords: *Women's Rights, Economic Equality, Marital Property, Marriage and Divorce, Family Law*

Prevalence and Demographic Profiles of Child Sexual Abuse among Maldivian Tertiary Students: A Retrospective Study

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Child sexual abuse (CSA) is a major public health and human rights issue with lifelong psychological, physical, and social consequences. In the Maldives, limited evidence exists on the prevalence and patterns of CSA among young adults. This study aimed to determine the prevalence and patterns of CSA and describe the demographic characteristics of affected individuals. A cross-sectional retrospective study was conducted among 505 university students aged 18–50 years using a proportionate stratified sampling approach with voluntary participant recruitment. Participants represented 11 faculties, four campuses, and 44 academic programmes. Overall, 49.1% (n = 248) of participants reported experiencing at least one form of CSA during childhood, while 50.9% (n = 257) reported no such experience. Non-contact CSA was the most common form (74.5%), followed by contact CSA (25.5%). CSA occurred most frequently during adolescence, 13–18 years (28.3%), compared with 7–12 years (12.5%) and 1–6 years (5.2%). Most participants were female (50.8%), and youth 18–24 years (79.8%) accounted for the largest proportion of those reporting CSA. Perpetrators were predominantly male (41.1%), with family friends (32.6%), friends (25.0%), and caretakers (24.0%) identified as the most common perpetrators. The high prevalence of CSA highlights the need for trauma-informed support services, awareness programmes, and strengthened child protection policies in the Maldives. Further national research is recommended to determine population prevalence and identify risk factors to inform prevention and early intervention strategies.

Keywords: *Child sexual abuse, prevalence, adolescence, perpetrator, Maldives*

Healing through Faith: Perceptions and Practices of Ruqyah Practitioners in the Maldives

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Ruqyah, an Islamic spiritual healing practice continues to be widely sought in the Maldives for emotional, psychological, and spiritual difficulties. Its continued reliance reflects the cultural significance of faith-based healing, yet there remains limited understanding of how Ruqyah is practiced and perceived within the local context. This aimed to explore the perspectives and practices of Ruqyah practitioners and identify factors sustaining its use in the community. A qualitative exploratory study was conducted using a participatory research framework. Six Ruqyah practitioners from the Greater Malé area were purposively recruited based on experience and active practice. Data were gathered through semi-structured interviews, filed notes and collaborative discussion forums, and analyzed thematically using Braun and Clarke's framework. The findings revealed that practitioners viewed Ruqyah as a comprehensive healing modality and treatment commonly involved Qur'anic recitation alongside complementary spiritual practices. Practitioner training was largely non-standardized, relying on independent study, informal mentorship and short-term trainings. Participants perceived Ruqyah as particularly beneficial for spiritually attributed conditions, while many recognizing limitations in addressing biomedical disorders. The study also identified concerns regarding the absence of regulation, including risks of exploitation, psychological harm, and unsafe practices. Although opinions on formal oversight varied, most practitioners emphasized the importance of ethical standards and accountability. These findings demonstrate that Ruqyah remains an important parallel system of care in the Maldives and highlight the need for greater recognition of spiritual healing practices. Strengthening ethical safeguards and fostering collaboration between biomedical and spiritual care systems may improve safety, accessibility, and holistic patient care.

Keywords: *Ruqyah, mental health, faith-based healing, Maldives, participatory research*

Understanding Consumer Rights Awareness: Knowledge, Trust and Consumer Redress

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Consumer protection has become an increasingly important component of modern economies, ensuring that consumers are treated fairly, receive accurate information, and have access to effective remedies when their rights are violated. The study aims to assess the level of consumer rights awareness in the Maldives and examine variations in consumers' knowledge and understanding across different service sectors. Specifically, the research assesses consumers' awareness of their rights, understanding of available remedies, confidence in information provided by businesses, and knowledge of complaint and redress mechanisms. A quantitative cross-sectional research design was employed using a structured questionnaire. Data were collected from 325 consumers residing in the Greater Male Region, through a survey administered using convenience sampling. Descriptive and inferential statistical analyses were conducted to assess consumer awareness and compare differences in knowledge, understanding, and perceptions across key sectors. The findings indicate that consumer awareness of fundamental rights and available remedies is generally moderate, with significant variations across sectors. Consumers demonstrated relatively higher awareness in banking and telecommunications than e-commerce and healthcare services. Awareness of complaint procedures and available remedies was limited, while trust in information provided by business varied considerably among sectors. The study highlights the need for targeted consumer education programs, improved information dissemination, and sector-specific policy interventions. Overall, the findings provide a strong evidence base for strengthening consumer education, enhancing regulatory oversight and informing future reforms to improve consumer protection in the Maldives.

Keywords: *Consumer protection, Consumer rights, Consumer awareness, Consumer awareness, Maldives.*

"The Denial of a Rightful Claim": The Existence of Female Apologetic in Barclays Women's Super League"

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The present world sees the iconic stage sports have achieved as a global celebration of athletic performance by various sporting bodies through the availability of a sport language which captures the sports' essence. Nonetheless, there is a dearth of research on the linguistics of English Association Football focusing on female football players. Thus, this study explores how the live verbal commentary of women's Tier 01 English football league system, Barclays Women's Super League (WSL), portrays female football as a deviant form of men's football. Substantiated by Judith Butler's and Judith Halberstam's theories on gender and performance, the study explores how instances of (un)conscious match commentary reinforce masculine hegemony in football through subsequent otherisation of female football players by examining twelve matches representing each participant team of WSL 2023/2024 season. The analysis reveals that despite female football players' athleticism, the commentary overshadows their full potential by emphasising feminine markers that are outside the game and criticising performance that fails to fit the accepted defini=on of female athleticism. This partial visibility and players' conformity to media representations of female athletes perpetuate the female apologetic, which strategically curbs the rise of female athleticism. However, the analysis underscores that the intersection of athleticism, culture, and gender through female football (re)configures football as a paradigm to contest gender ideologies. Therefore, this study elucidates that the meticulous application of language which symbolically suppresses female football players' sporting capacity through the strategic usage of female apologetic awards and conversely denies women's rightful claim to football.

Keywords: *Discourse analysis, Female Apologetic, Gender, Langauge of Sports, Women's Football*

Mapping the Landscape of Islamic Psychology: Foundations, Approaches and Models

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The field of Islam and Psychology or Islamic Psychology (IP) has expanded and diversified globally, evolving from an Islamically-driven reaction and critique of Western psychology, into a multifaceted academic field, with subsequent development of models for counselling and psychotherapy. However, as the field has expanded, so too has the complexity of its concepts and frameworks, leaving the field seemingly dispersed and fragmented. Moreover, this diversity and complexity have also created some confusion and debate over what IP really is. Thus, illustrating a comprehensive landscape of IP is imperative. Based on a narrative review involving the purposeful selection and conceptual synthesis of prominent and foundational literature in the field, particularly, by reviewing and considering the relevant commentaries by York Al-Karam (2018, 2020), Kaplick and Skinner (2017) and Iqbal and Skinner (2021), this paper provides a structural mapping of the IP landscape. It includes categorization or classification of IP's various foundations, approaches and models, and illustrates how these are linked and interconnected, in its historical and developmental context. It also identifies and maintains Kaplick and Skinner's (2017) emphasis of what can be considered as 'true' IP, in relation to other distinct but related movements. While acknowledging the inherent oversimplifications in the diagrammatic presentation and noting that the scholars and models mentioned are representative rather than exhaustive, this framework may serve as an important tool to understand IP. Furthermore, the distinct paths and interconnectedness shown, shall provide a clearer orientation for students and researchers to help them navigate in the field's evolving topography.

Keywords: *Islamic Psychology, Theories and models, Psychotherapy, Counselling, Islam*

Sub-theme 7: Resilient Economies and Future Markets

6 Abstracts



Organizational Culture, Organizational Constraints and Interpersonal Conflicts among Employees Working in Coworking Space

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The present research was conducted to investigate the relationship between organizational culture, organizational constraints and interpersonal conflicts among employees working in coworking spaces. Correlational research design was used. It was hypothesized that there is a significant relationship between organizational culture, organizational constraints and interpersonal conflicts in individuals working in coworking spaces. Organizational culture and organizational constraints both would likely to predict interpersonal conflicts. There would be gender differences in organizational culture, organizational constraints and interpersonal conflicts. Total sample of 150 individuals working in coworking spaces was included. Organizational culture assessment questionnaire (Sashkin & Rosenbach, 2013), Organizational Constraints Scale, OCS (Spector & Jex, 1997) and Interpersonal Conflict at Work Scale, ICAWS (Spector. Jex, 1997) were used to assess the understudy variables. Corelation, Regression & t test anaylsis was used. The results indicated that there was a significant relationship between organizational culture, organizational constraints and interpersonal conflicts and both were the predictors of interpersonal conflicts. Organizational constraints had moderating effects on interpersonal conflicts to increase it. No gender differences were found in terms of interpersonal conflicts. The present research can be implied to the field of organizational psychology. It focuses on the phenomenon of the cultures and constraints of the organization and their contribution to interpersonal conflicts in individuals. The benefits of coworking spaces such as promoting better environment, organizational culture, reducing constraints and interpersonal conflicts are pointed out.

Keywords: *Organizational culture, Organizational constraints, Interpersonal conflicts, Coworking spaces*

Impact of Economic Policy Uncertainty and Geopolitical Risk on Bank Stability: Evidence from India and China

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This study examines the differential effects of economic policy uncertainty (EPU) and geopolitical risk (GPR) on bank stability in India and China over the period 2011–2024. Using a panel dataset comprising 32 Indian and 51 Chinese commercial banks, we employ fixed effects models, and two-step system Generalised Method of Moments (GMM) estimations to account for unobserved heterogeneity, distributional heterogeneity, and endogeneity concerns. Our findings reveal that EPU exerts a positive and statistically significant effect on Chinese bank stability, consistent with the precautionary behaviour hypothesis, whereby banks tighten lending standards and strengthen capital buffers under heightened policy uncertainty. In contrast, EPU has a negligible and inconsistent effect on Indian banks, suggesting weak transmission of domestic policy signals through the banking system. Geopolitical risk consistently destabilises banks across both countries, particularly in China, where the magnitude is economically significant across multiple specifications. Subsample analyses by bank size and loan intensity reveal that larger and more credit intensive banks exhibit stronger responses to uncertainty. These findings carry important implications for macroprudential regulators and risk managers in emerging economies navigating an era of structural uncertainty.

Keywords: *Economic policy uncertainty, Geopolitical risk, Bank Stability*

An Evaluation of The Determinants of Work-Life Balance in The Banking Sector of The Maldives

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The banking sector is a highly target-oriented and performance-driven environment, which creates higher job stress. In such a work environment, it remains essential to have a work-life balance to ensure employee well-being and sustained productivity. The purpose of this study is to examine the factors influencing work-life balance among employees in the banking sector of the Maldives. The focus of this research is to analyse the influence of working hours, supportive management, marital and family status and personal coping strategies on the employees' work-life balance of the employees working in the banking industry of the Maldives. The study used a quantitative research approach, and data were collected from 178 employees from the local Banks operating in the Maldives. A structured questionnaire was distributed online to employees working in selected local banks in the Maldives to collect standardized and reliable data relevant to the study. To summarize the demographic characteristics of the respondents', descriptive statistics were used. Additionally, Spearman's rho Correlation Analysis, Categorical Regression and Kruskal-Wallis Test were conducted to examine the relationship between the independent variable, working hours, supportive management, marital and family status and personal coping strategies and the dependent variable, work life balance. The findings indicate that supportive management and personal coping strategies had a positive influence on employees' work-life balance, while long working hours negatively affected their ability to maintain a healthy balance between work and personal life. Additionally, marital and family status had a moderate impact on how the employees manage their work and personal life. The originality and value of this study stem from its focus on the Maldivian banking sector, where only limited research was previously conducted based on the determinants of work life balance. The study offers practical insights for bank management and policymakers on improving their strategies to implement employee well-being and also to improve overall organizational performance. Work-life balance

Keywords: *Work-life balance, Employee well-being, Working hours, Supportive management, Marital and family status, personal coping strategies*

Corporate Social Responsibility as a Financing Mechanism for Hospital Infrastructure: Evidence, Governance, and a Framework for Sustainable Health Systems

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India's mandatory Corporate Social Responsibility (CSR) framework, established under Section 135 of the Companies Act 2013, obligates qualifying corporations to invest 2% of average net profits in socially beneficial activities, with healthcare as a listed priority. Despite aggregate healthcare CSR expenditure exceeding ₹22,000 crore in 2024, investment in long-term hospital infrastructure remains peripheral, with most funds directed toward episodic interventions. This pattern represents a missed opportunity for sustainable health systems strengthening, relevant not only to India but to all low- and middle-income settings seeking blended financing models for public health infrastructure. The study aimed to synthesise evidence on CSR-funded hospital capital projects, map the regulatory framework enabling such investments, document precedents, and identify governance challenges limiting scale. A structured narrative review of peer-reviewed and grey literature (2013–2025), including MCA National CSR Portal data, ICMR guidelines, corporate annual reports, and regulatory circulars. Documented precedents span hospital construction, oncology centres, specialised equipment, and research infrastructure. Key governance barriers include fragmentation, short-termism driven by annual compliance cycles, regional inequity, regulatory ambiguity for public-sector recipients, and inadequate impact assessment frameworks. CSR can function as a credible, sustainable infrastructure financing supplement for public hospitals when anchored in DPR-based project structuring, multi-year regulatory provisions, standardised public-private governance agreements, and a national hospital CSR registry. The proposed framework offers transferable lessons for health infrastructure financing in other developing economies.

Key words: *Corporate Social Responsibility, Public-Private Partnerships, Governance, Sustainable Health Financing, Hospital Infrastructure*

Does Digital Connectivity Foster Entrepreneurship? The Moderating Role of Innovation in Emerging Economies

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As global economic activity shifts from developed to emerging economies, rising unemployment and the rapid spread of digital technologies have renewed interest in entrepreneurship as a driver of growth and employment. The study examines the impacts of digital connectivity and innovation, and their interaction, on entrepreneurship in emerging economies. We used economic growth, trade participation, and government expenditure as control variables. The data were collected from the World Bank and the KOF Swiss Economic Institute. Panel confirmed cointegration, mixed 1(0)/1(1) variables, and cross-sectionally dependent error structure. Therefore, PMG-ARDL is employed to analyse, and the FGLS model is employed for robustness check. This paper contributes to the debate that digital connectivity plays a beneficial and statistically significant role in fostering entrepreneurship across both models. The evidence also suggests that in the long run, innovation activity acts as a moderating factor between digital connectivity and entrepreneurship. Suggesting that innovation amplifies the positive effects of digital connectivity on entrepreneurship. Correspondingly, observed that all control variables have a positive impact on entrepreneurship. Firstly, economic growth helps entrepreneurs by offering new market opportunities. Secondly, the government allocates its expenditure to public goods such as improved transportation systems and digital infrastructure, which indirectly support entrepreneurial ventures. Lastly, trade participation enhances entrepreneurial opportunities by expanding market access and improving resource allocation. The policy implication is that the government should prioritise their investments in the formation of digital infrastructure. Beyond merely expanding broadband and mobile internet coverage, there should be a heightened focus on enhancing digital payment infrastructure.

Keywords: *ICT, Digital connectivity, Innovation, Entrepreneurship*

Do Macroeconomic Policies Foster Green Growth? Evidence from Emerging and Advanced Asian Economies

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Asia's rapid economic expansion has intensified environmental degradation, underscoring the need for green growth to achieve an optimal balance between economic expansion and ecological protection. However, comparative evidence on how macroeconomic policies and energy consumption shape green growth across Asian economies at different stages of development remains limited. This study addresses this gap by examining the effects of monetary policy (real interest rate), fiscal policy (government expenditure), renewable and non-renewable energy consumption, and economic globalization on green growth. Using balanced panel data for 7 emerging and 5 advanced Asian economies over the period 1990 2021, the Pooled Mean Group Autoregressive Distributed Lag (PMG-ARDL) model is employed to estimate long- and short-run dynamics, and the Driscoll-Kraay standard error test is used to assess robustness. The findings reveal that lower interest rates support green growth across both regions through an investment-incentive mechanism that encourages capital allocation toward environmentally sustainable activities. Government expenditure stimulates green growth in emerging Asia but constrains it in advanced Asia, reflecting differences in fiscal capacity and policy priorities across development stages. Renewable energy consumption supports green growth, whereas reliance on non-renewable energy and economic globalization consistently impede it, likely reflecting carbon-intensive trade and production linkages. These findings contribute to the green growth literature by revealing development-stage heterogeneity in policy effectiveness, underscoring the need for context-specific monetary, fiscal, and energy policy frameworks to accelerate sustainable economic transformation across Asia.

Keywords: *Green Growth, Monetary Policy, Fiscal Policy, Renewable Energy, Asian Economies*

Enhancing Startup Support through AI and Digital Transformation: A Technology Business Incubator Perspective

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Technology Business Incubators (TBIs) play a critical role in fostering innovation, entrepreneurship, and economic development by supporting technology-based startups throughout their growth journey. However, traditional incubation models often face challenges in delivering mely mentorship, resource alloca on, performance monitoring, and decision supporting increasingly complex entrepreneurial environments. The rapid advancement of Ar ficial Intelligence (AI), data analy cs, Internet of Things (IoT), and digital technologies presents new opportuni es for transforming incubation ecosystems and improving startup outcomes. This study examines how AI-driven digital transformation can enhance the effectiveness of Technology Business Incubators and strengthen entrepreneurial ecosystems. Drawing upon a multidimensional incubation framework, the research integrates insights from innovation management, digital transformation, entrepreneurship, and technology-enabled decision systems. The study employs a mixed method approach combining longitudinal data from Indian TBIs, stakeholder perspectives, and ecosystem-level analysis to explore the role of digital technologies in improving incubator performance and startup support mechanisms. The findings indicate that AI enabled incubation systems significantly enhance mentoring efficiency, resource matching, startup monitoring, and knowledge-sharing processes. Digital platforms facilitate real-me decision-making, improve communica on among ecosystem stakeholders, and enable data-driven evalua on of startup progress. The results further suggest that incubators with stronger digital capabili es demonstrate higher levels of startup gradua on, innova on output, and ecosystem connec vity. AI-powered analytics also support early iden fica on of startup risks and opportunites, allowing incubator managers to provide more targeted interventions and strategic guidance. The study contributes to the growing literature on digital entrepreneurship and innova on ecosystems by proposing a conceptual framework that links AI adoption, digital transformation, and incubator effectiveness.

Keywords: *Technology Business Incubators, Artificial Intelligence, Digital Transformation, Innovation Ecosystems, Entrepreneurship*

Necessity of Creating a New Specialized International Tax Competitiveness Index for Entrepreneurs and Investors

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The mobility of capital has led to tax competition, in which countries seek to adopt tax systems that are most attractive to entrepreneurs and investors. Existing indicators, such as the International Tax Competitiveness Index (Index), show how well countries structure their tax systems for this purpose. This Index evaluates countries across five main tax categories: corporate taxes, cross-border tax rules, consumption taxes, property taxes, and individual taxes. However, the largest part of the tax burden for entrepreneurs and investors consists of personal income tax and social security contributions, which fall under the category of individual taxes. Since the Index takes into account only the relevant personal income tax rates and social security contribution rates, rather than the actual tax burden, this study examines the following research question: Does the existing ranking of countries in the International Tax Competitiveness Index adequately reflect the actual burden of personal income tax and social security contributions as determined by their calculation? The results show that the ranking of countries in the International Tax Competitiveness Index differs from the ranking based on the actual burden of personal income tax and social security contributions. It can therefore be concluded that the Index provides a general assessment of countries' tax systems. For a practical assessment of the largest component of the tax burden faced by entrepreneurs and investors, rankings should instead be based on calculations using the proposed formula. Therefore, it is necessary to create a new index based on the results of these calculations.

Keywords: *International Tax Competitiveness Index, personal income tax, social security contributions*

Mediating Influence of Organisational Commitment on the Relationship between Interactional Fairness and Employee Performance

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This study examined the mediating role of organisational commitment in the relationship between interactional fairness and employee performance among employees of higher education institutions. A sample of 250 academic and administrative employees from higher education institutions in the Maldives was selected using a convenience sampling technique. A structured questionnaire comprising 26 items was distributed, and data were collected. Structural Equation Modelling (SEM) using AMOS 24.0 was employed to examine the direct effects of interactional fairness on organisational commitment and employee performance, as well as the mediating effect of organisational commitment. The results showed that interactional fairness had a significant positive effect on organisational commitment. However, no significant direct effect was found between interactional fairness and employee performance. In terms of mediation, organisational commitment had a significant positive mediating effect on the relationship between interactional fairness and employee performance. Therefore, it was concluded that improving employees' perceptions of fair and respectful interpersonal treatment strengthens organisational commitment, which subsequently enhances employee performance. The overall findings indicate that organisational commitment fully mediates the relationship between interactional fairness and employee performance. This study contributes to the current knowledge of organisational fairness by confirming that organisational commitment is a key mechanism through which interactional fairness improves employee performance. The findings provide practical implications for institutional leaders and human resource practitioners by emphasising the importance of promoting fair supervisory practices, respectful communication, and supportive workplace relationships to strengthen organisational commitment and improve employee performance in higher education institutions.

Keywords: *Interactional Fairness, Organisational Commitment, Employee Performance, Higher Education Institutions, Structural Equation Modelling (SEM)*

Strategic Trade Management Challenges in the Maldives: Toward Strengthening National Compliance with International Regulation Norms

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Strategic Trade Management (STM) is involved with the importation, exportation, transit, and transshipment of dual-use items to prevent their misuse in activities related to Weapons of Mass Destruction (WMD) and related security threats. As a small island developing state (SIDS) on very busy maritime/air routes, the Maldives faces diversion and transshipment risks when controls are weak or incomplete.
Aim: explore institutional actors lived experiences of STM implementation in the Maldives and identify practical pathways to strengthen compliance with international norms (including UNSCR 1540).
Methodology: Qualitative phenomenology design was utilized for the study. In-depth interviews were conducted with purposively selected officials from key government institutions. In addition, laws and regulations were reviewed using a checklist made from international best practices. Thematic analysis (Braun & Clark approach) was carried out.
Findings: participants described a "legal vacuum" in the system, not having a dedicated STM law, fragmented statutes, limitations in enforcement, and delayed legislative progress. Moreover, technology deficits such as container scanners leading to manual inspections, dispersed geography, infrastructure constraints, and maritime vulnerabilities reduce coverage. It was also found that awareness of STM exists across the institutions, however, technical competence is low, participants reported difficulty in identifying dual use items and need for periodic training as dual-use items and technology evolves fast. STM implementation in the Maldives is best characterized by aspirated compliance amid structural limitations. The participants recognize the importance and risks involved in STM, but the systems in place are not strong enough to make full compliance with international norms which need strengthening.

Keywords: *Strategic trade management, Dual-use goods, Maldives, Export control, Border Security*

Exploring the impacts of redundancy on the resort workforce of the Maldives due to the Covid-19 pandemic

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The Covid-19 pandemic brought the Maldivian tourism sector to stand still point resulting a mass workforce redundancy in the Maldives resort sector that employs 59% of the tourism workforce. Amid this global crisis organisations made corporate decisions under uncertain conditions to ensure business survival and post crisis recovery. This research aims to explore the types of strategic decisions taken during the Covid-19 crisis induced mass redundancy in the resort sector of the Maldives, examine the factors that led to these decisions and analyse how these decisions impacted their operations and remaining workforce. This study contributes to crisis human resource management literature by providing insights into managerial decision-making processes amid unprecedented organisational change. This inductive qualitative study adopted semi-structured interviews with managers who were part of the redundancy decisions made due to COVID-19 crisis after the global lockdown in March 2020. Using purposive sampling, data were collected from 15 participants who were resort and human resource managers. The recurring themes were identified using content data analysis and the findings indicate that all COVID-19 induced redundancies were top-down decisions and the phases of redundancy planning and implementation could not follow as the severity of the crisis required rapid decision making. Most resorts adopted partial redundancies and salary deductions, while some of the resorts implemented a mass redundancy and retained a reduced workforce with minimum wage. The managers comprehensively agreed that major factors that influenced these decisions were the mounting financial pressure that threatened the stability of the business. The limited workforce constrained operations in service-oriented housekeeping and food and beverage departments, which also affected the overall service quality of resorts. Furthermore, the existing employees expressed demotivation due to work overload and lack of job security. Further studies could examine employees' perspectives and explore crisis redundancy planning strategies for resilient human resource management in the resort sector.

Keywords: *Maldives resort sector, Workforce redundancy, COVID-19, Crisis human resource management, Employment*

The Impact of Service Quality Dimensions on Customer Satisfaction, Retention, and Purchase Intention: An Empirical Study of Retail Customers in the Greater Malé Region, Maldives

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Service quality has been widely recognised as a key determinant of customer satisfaction and behavioural outcomes within retail settings. However, empirical evidence from Small Island Developing States (SIDS), particularly the Maldives, remains limited. This study investigates the influence of six service quality dimensions: responsiveness, assurance, tangibility, empathy, reliability, and after-sales services on customer satisfaction, customer retention, and purchase intention among retail consumers in the Greater Malé Region. Grounded in the SERVQUAL framework (Parasuraman et al., 1988), the study adopted a quantitative cross-sectional research design and collected data from 407 customers of four major retail chains operating in the Maldives. Data were analysed using descriptive statistics, Exploratory Factor Analysis (EFA), Pearson correlation, and multiple regression analyses. The findings revealed that all service quality dimensions were positively associated with customer satisfaction, customer retention, and purchase intention. The measurement model demonstrated satisfactory construct validity, with the extracted components explaining 65.18% of the total variance. Regression analyses further indicated that service quality dimensions explained 77.3% of the variance in customer satisfaction and customer retention and 56.3% of the variance in purchase intention. Among the dimensions examined, after-sales services emerged as a particularly influential factor in enhancing customer satisfaction and retention, underscoring the importance of post purchase support in retail environments characterised by import dependency and logistical constraints. Rather than proposing a theoretical extension, the study provides contextual validation of established service quality dimensions within an under researched SIDS context. The findings contribute to the retail service quality literature and offer practical insights for retailers seeking to strengthen customer loyalty and enhance long-term business sustainability through strategic service quality improvements.

Keywords: *Service quality, SERVQUAL, customer satisfaction, customer retention, purchase intention*

Consuming tourism tragedy in the age of social media

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Social media has changed how tourism crises are communicated, with content creators playing an increasingly important role in shaping public understandings of tragic events. Tourism destinations are particularly vulnerable to such communication because destination image can be largely shaped through mediated representations. Tourism crisis communication research has primarily focused on communication by destination organisations and news media, with comparatively less attention given to how content creators frame tourism crises on social media. Addressing this gap, this study examines Facebook and TikTok content titles relating to the 2026 Maldives cave-diving tragedy to explore how content creators construct tourism crisis narratives on social media. The data were analysed using thematic analysis, drawing on spectacle theory, attention economy, and platformisation as interpretive lenses. The findings show that content titles consistently employed dramatisation, mystery, danger, and emotional appeal, shifting the focus from factual reporting to attention-grabbing narratives. Such narratives have the potential to influence perceptions of destination safety and destination image, particularly during unfolding tourism crises. The study extends tourism crisis communication research by shifting attention from destination organisations to content creators, recognising their increasingly important role in constructing tourism crisis narratives and shaping perceptions of tourism destinations during times of crisis.

Keywords: *Crisis communication, social media marketing, Maldives Cave Diving, Spectacle theory, Tourism crisis narratives*

Necessity of Creating a New Specialized International Tax Competitiveness Index for Entrepreneurs and Investors

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University of Latvia

The mobility of capital has led to tax competition, in which countries seek to adopt tax systems that are most attractive to entrepreneurs and investors. Existing indicators, such as the International Tax Competitiveness Index (Index), show how well countries structure their tax systems for this purpose. This Index evaluates countries across five main tax categories: corporate taxes, cross-border tax rules, consumption taxes, property taxes, and individual taxes. However, the largest part of the tax burden for entrepreneurs and investors consists of personal income tax and social security contributions, which fall under the category of individual taxes. Since the Index takes into account only the relevant personal income tax rates and social security contribution rates, rather than the actual tax burden, this study examines the following research question: Does the existing ranking of countries in the International Tax Competitiveness Index adequately reflect the actual burden of personal income tax and social security contributions as determined by their calculation? The results show that the ranking of countries in the International Tax Competitiveness Index differs from the ranking based on the actual burden of personal income tax and social security contributions. It can therefore be concluded that the Index provides a general assessment of countries' tax systems. For a practical assessment of the largest component of the tax burden faced by entrepreneurs and investors, rankings should instead be based on calculations using the proposed formula. Therefore, it is necessary to create a new index based on the results of these calculations.

Keywords: *International Tax Competitiveness Index, personal income tax, social security contributions*

Sub-theme 8: Interdisciplinary Research and Global Collaboration

7 Abstracts



Epistemic Modes, Organizational Forms, and Practical Paths of Interdisciplinary Construction in Chinese Higher Education

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In the era of knowledge production transformation and national strategic initiatives, interdisciplinary construction has emerged as a cornerstone of Chinese higher education reform. This study constructs a comprehensive analytical framework rooted in the dual perspectives of "knowledge" and "organization" to systematically investigate the evolving landscape of interdisciplinarity. Methodologically, this research employs a qualitative multiple-case study design, selecting a representative sample of "Double First-Class" universities in China to ensure diversity in institutional types and disciplinary strengths. Data collection involves a meticulous analysis of policy documents and institutional reports from 2009 to 2026, adhering strictly to academic ethical standards regarding data integrity and objective interpretation. The findings categorize interdisciplinary knowledge into three distinct epistemic modes: Polar Diffusion, Advantage Integration, and Multidisciplinary Symbiosis. Organizationally, three primary forms are identified—university-independent, university-enterprise collaboration, and government-led models—each reflecting unique interactions between academic, market, and administrative logics. However, the study identifies critical bottlenecks, including tool-system fragmentation, discipline-centred evaluation barriers, and rigid cultural identities. The research concludes that successful interdisciplinary advancement requires a dynamic "knowledge-organization" adaptation. It proposes a synergistic implementation path through reconstructing shared tool platforms, establishing categorized evaluation mechanisms, and reshaping a collaborative academic ecosystem. These insights provide a strategic roadmap for policymakers and university administrators to overcome the "coupling dilemma" and foster sustainable interdisciplinary growth in the global higher education landscape.

Keywords: *Higher Education; Interdisciplinary; Disciplinary Construction; Epistemic Modes; Organizational Forms*

From Insight to Screening, Closing the Breast Cancer Awareness Gap: A Cross-Sectional Study Conducted in Greater Male' Area

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Breast cancer is the most diagnosed cancer globally among women with an alarming increase in its incidence in Maldives. Breast cancer is identified as the second highest cancer among the Maldivian population. The main objectives of this study are to identify the association between the awareness about breast cancer (breast cancer disease, risk factors, warning signs and breast cancer screening methods) and screening behaviour of the working women of Greater Male' Area, Maldives. This study further aims to identify the barriers that hinders screening practice among the study population. Methods: This is a cross-sectional study consisting of 309 working women from various institutions in the Greater Male' Area, Maldives. Awareness, screening behaviour and barriers were assessed via a standardized questionnaire adapted from validated toolkits. Results: This study comprises a response rate of 98.7% out of which 40.2% of the participants being 30-39 years of age, 66.3% being married and 49% of them have sustained an education level of a degree or higher. Post interview results revealed that 87.5% of the participants were knowledgeable about breast cancer. Assessment of screening behaviour revealed that 53.4% of the respondents exhibited an adherent behaviour. Moreover, it established that 80.6% had adequate knowledge regarding breast cancer screening and breast cancer. Although 79.6% had a misconception regarding the survival of breast cancer. A large group of participants disagreed with having any barriers to performing breast self-examination and mammography. Most individuals 51.7% regarded not having enough female physicians as the barrier to clinical breast examination. Overall, analytic outcomes revealed 61.0% met an insignificant threshold in terms of barriers towards screening. 48.5% respondents had a good awareness level and good screening behavior. The inferential statistics demonstrated a significant relationship between awareness level and screening behaviour. Most of the participants were well informed regarding risk factors of breast cancer, warning signs and symptoms. Participants also proved to be knowledgeable about breast cancer screening methods and thus revealed good screening behavior, with insignificant barriers towards screening. Most participants, 48.5% had a good awareness level and good screening behaviour.

Keywords: *Breast cancer (BC), Breast self-examination (BSE), Clinical breast examination (CBE), Breast cancer screening.*

Advancing Light Microscopy: Interdisciplinary Collaboration and Capacity Building via the India BioImaging Network

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Advancing complex biological insights requires cutting-edge light and super-resolution microscopy, a progression that demands global cooperation to overcome resource gaps. This mixed-methods study evaluated 16 imaging core facilities across India's North, South, East, and West zones to understand their demographics and challenges, aiming to provide career support guidelines for bioimaging scientists. Data were compiled from institutional websites, the India BioImaging database, and on-site surveys. The findings highlighted a stark regional imbalance: the South zone alone possessed 22 confocal and 10 super resolution systems, outnumbering the other three zones combined (which had 20 confocals and 7 super-resolution systems). Personnel data revealed a doctorate-to-master's degree ratio of 1.86 among staff, with better-resourced facilities delivering higher-quality training programs and workshops. The top three challenges identified by the community were: (1) Career Mismatch: A disconnect between traditional academic career paths and service-oriented facility roles, (2) Underappreciation: A lack of understanding regarding the value and impact of imaging scientists and core facilities and (3) Stagnation: Insufficient dedicated training and professional development opportunities. In conclusion, the study illustrates that structured capacity building enhances local technical competencies and fosters open science. When paired with active science communication and public engagement, these strategies can successfully democratize geographical and resource disparities.

Keywords: *Bioimaging, Core facilities, Open science, Capacity building, Professional development and training*

Navigating Multiple Subjectivities: A Reflexive Examination of Positionality, Insider Research, and Researcher Agency in Qualitative Inquiry

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Reflexivity has become a defining feature of contemporary qualitative research, yet many reflexive accounts remain limited to brief positionality statements that inadequately capture the complexity of researchers lived engagements with the field. This paper presents a critical reflexive examination of positionality, insider research, and researcher agency arising from a qualitative study investigating teachers' enactment of creative and critical thinking within curriculum reform in the Maldives. Drawing on reflexive journals, field notes, analytic memos, and post-fieldwork reflections, the paper employs an interpretive thematic analysis to examine how researcher subjectivities shaped data generation, interpretation, and representation. The analysis identified three recurring and interacting subjectivities—the Teacher-Educator I, the Teacher-Advocate I, and the Responsible-Parent I—each influencing observation, ethical decision-making, and meaning-making in distinct yet interconnected ways. Building on these inductive findings and engaging them with existing scholarship on reflexivity and positionality, the paper develops a conceptual Layered Subjectivity Model that theorizes qualitative knowledge as emerging through four interconnected interpretive layers involving researchers, participants, representational practices, and readers. The model extends conventional understandings of reflexivity by shifting attention from researcher self-awareness alone to the relational and iterative processes through which qualitative knowledge is co-constructed. By foregrounding the complexities of multiple subjectivities, the paper contributes to ongoing methodological debates concerning reflexivity, positionality, insider research, researcher agency, and qualitative rigor.

Keywords: *Reflexivity, Positionality, Insider research, Researcher agency, Qualitative inquiry*

REACH Stakeholder Research Thematic Prioritisation: Findings from an Expert Panel Workshop

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The Regional Hub for Asia Climate Change and Health (REACH) Expert Panel Workshop, held on 20 June 2025 in a hybrid format at Monash University Malaysia, convened 25 experts from 11 countries, largely in South and Southeast Asia to identify climate and health research priorities for the region. Using a backcasting approach, the workshop combined thematic breakout sessions, stakeholder ideation and insights, as well as evidence from prior research to generate actionable ideas. Four concurrent breakout discussions were conducted around the thematic areas of (1) community-based climate adaptation interventions, (2) natural disaster resilience and food security, (3) health system resilience, and (4) climate-literate health workforce. Outputs were refined through facilitator-led debrief sessions on 8 and 11 July 2025, focusing on feasibility within a 24-month timeframe and alignment with REACH's strategic objectives and grant mechanisms. The final consolidated priorities include (1) co-designing culturally adapted behavioural heat adaptation interventions and/or nature-based solutions, (2) building disaster-resilient communities through smart climate communication, (3) evaluating and strengthening climate-resilient primary care facilities, and (4) development of toolkits and interventions to build a skilled, diverse, inclusive and climate literate healthcare workforce. By building on these priorities, REACH aims to inform its call for applications and evolve into a sustainable hub that not only supports immediate adaptation measures but also enables future funding calls that advance long-term climate resilience and net-zero health care across the region.

Keywords: *Climate Change, Health, Southeast Asia, South Asia, Adaptation*

Sub-theme 8: Innovative Strategies for Business and Organizational Management

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Working Conditions, Vulnerabilities and Labour Exploitation among Migrant Workers in the Maldives

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The Maldives relies heavily on migrant labour, which plays a vital role in supporting national development and key economic sectors. Regardless of their significant contribution, migrant workers continue to face vulnerabilities shaped by structural, recruitment, employment and institutional factors. Existing literature highlights how recruitment debt, deceptive recruitment practices, poor working conditions, overcrowded accommodation, employer dependency and limited access to protection contribute to labour exploitation across the migration journey. However, there remains limited qualitative research exploring these issues within the Maldivian context from both migrant workers' and institutional perspectives. This study aims to explore the working conditions, vulnerabilities and labour exploitation experienced by migrant workers in the Maldives while examining the perspectives of relevant government institutions. Guided by a qualitative exploratory research design, the study will use purposive sampling, and where necessary snowball sampling, to recruit approximately ten migrant workers from selected employment sectors and representatives from eight key government and partner institutions. Data will be collected through semi-structured interviews and analysed using Braun and Clarke's (2006) thematic analysis to identify recurring patterns and themes across participants' experiences. The study is expected to contribute to the limited body of qualitative research on migrant labour in the Maldives by providing a deeper understanding of the factors that shape vulnerability and labour exploitation. The findings are also expected to inform evidence-based recommendations aimed at strengthening labour migration governance, improving labour protection mechanisms, enhancing institutional coordination, and supporting the wellbeing and rights of migrant workers.

Keywords: *Labour Exploitation, Labour Migration, recruitment practices, human trafficking, living conditions.*

Content analysis of YouTube videos on Hand hygiene technique: Adherence to WHO guidelines

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Hand hygiene (HH) is the most fundamental practice against healthcare-associated infections. YouTube usage is increasing day by day to enhance skills. However, those videos often lack peer review and inconsistency in the standard. The aim is to analyse the content of YouTube videos on hand hygiene technique and to evaluate their adherence to WHO hand hygiene guidelines. A descriptive cross-sectional study conducted using publicly available YouTube videos (n=8), using both quantitative and qualitative methods. Video Information and Quality Index (VIQI) and modified DISCERN tool used to assess technical quality and informational reliability. Content adherence evaluated using a structured scoring framework, and qualitative thematic analysis. All videos stressed the importance of HH, but the adherence limited. The content indicated moderate coverage with a final mean score of 3.63 ± 0.92. The VIQI acceptable quality (15.63 ± 3.24), while modified DISCERN indicated moderate reliability (15.13 ± 4.32). There was significant difference in score between organization and individual videos ($p = 0.046$), while no significant differences observed for VIQI or DISCERN scores. Spearman's correlation showed significant associations between VIQI and Overall Score ($p = 0.003$) and DISCERN and Overall Score ($p = 0.015$). Six qualitative themes emerged: promotion of HH and patient safety, inconsistent WHO adherence, variability in accuracy, visual clarity, technical professionalism, and limited evidence-based reliability. YouTube provides information on HH, However, adherence to WHO guidelines and consistency in evidence-based content remain limited, highlighting the need to follow the standard.

Keywords: *Hand hygiene, YouTube, WHO guidelines, Infection prevention, Video-based learning*

Sub-theme 9: Artificial Intelligence, Ethics, and Human Futures

7 Abstracts



Sub-theme 9: Artificial Intelligence, Ethics, and Human Futures

Artificial Intelligence for Good: Advancing Sustainable Development Goals through Intelligent Systems in Dentistry

Nishi Singh
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Artificial Intelligence (AI) is changing healthcare and creating big opportunities in dentistry. Many people around the world suffer from oral diseases and not everyone has equal access to care. Using AI in line with the United Nations Sustainable Development Goals (SDGs) can help improve oral health and make healthcare fairer for everyone. The aim of this study was to investigate the role of AI-driven systems in dentistry and their contribution to achieving Sustainable Development Goals related to health, education, innovation, and equity. This narrative overview synthesizes published literature on AI applications in dentistry, encompassing diagnostic imaging, clinical decision support systems, teledentistry, and educational technologies, and aligns them with relevant SDGs. AI holds significant potential to advance SDG 3 by enabling early disease detection and enhancing treatment planning. Its integration into education bolsters SDG 4, while innovations like teledentistry contribute to SDG 9. Improved access to care aligns with SDG 10, and optimized resource utilization supports SDG 12. Collaborative initiatives further reinforce SDG 17. AI-driven systems can enhance diagnostic accuracy, expand access, and promote sustainable dental practices. Addressing challenges related to data privacy, ethics, and regulations is essential to ensure responsible implementation and maximize their contribution to global health goals.

Keywords: *Artificial Intelligence, Deep learning, Sustainable Development Goals, Dentistry, Oral health*

Sub-theme 9: Artificial Intelligence, Ethics, and Human Futures

A Critical Review of Assessment Validity in the Era of Generative Artificial Intelligence

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The rapid advancement of genera&ve ar&ficial intelligence (GenAI) is reshaping longstanding assumptions about assessment, raising critical questions about the integrity and credibility of student learning in higher education. While universities have responded with a range of mitigation strategies, these responses often struggle to keep pace with the evolving capabilites of GenAI technologies. Concurrently, uneven practices in assessment design and implementation in higher education con&nue to challenge claims about the assurance of learning. This paper offers a critical review of scholarship addressing assessment validity in the context of GenAI. Using predefined selection criteria, articles published in ten leading higher education journals between 2023 and mid-2025 were selected and analysed. A total of 26 articles were included in the review, in which a discourse analysis method was used to interrogate prevailing narratives. The analysis identifies three dominant framings of assessment validity in the age of GenAI: (1) risk-oriented framings that emphasise academic integrity breaches, (2) rule-based approaches centred on detection and policy enforcement, and (3) design-focused approaches that advocate resilient assessment redesign. The paper contributes to ongoing debates on assessment validity in higher educa&on by reframing how assessment challenges are conceptualised and addressed, and by highlighting implications for policy and practice in an AI-mediated educational landscape.

Keywords: *Generative artificial intelligence, GenAI, assessment validity, higher education*

Sub-theme 9: Artificial Intelligence, Ethics, and Human Futures

AI and Worker Displacement: States' Obligations under International Human Rights Law

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The Maldives National University

The global employment landscape is being reshaped by artificial intelligence (AI), with millions of workers worldwide facing displacement. Despite its transmutative implications, however, AI remains poorly regulated. Given the strategic significance of the technology, the priority of global powers is to win the AI arms race, unconstrained by regulatory requirements. Accordingly, replacing human workers with AI systems is viewed just as a business decision for individual firms. On the other hand, the workers being displaced have a fundamental right to work, with corresponding obligations on states. While AI technologies are primarily developed and deployed by the private sector, the obligation to protect the rights of workers lies with states. Using doctrinal and normative research methods, this paper pursues two primary objectives. First, it examines the obligations of states under international human rights law in relation to AI-induced worker displacement. It argues that the fundamental right to work requires AI governance to be grounded in existing human rights obligations of states. Second, drawing on the political backlash precipitated by decades of neoliberal restructuring, it advances a normative argument that unregulated development of AI, or governance frameworks driven solely by considerations of efficiency and economic productivity risks generating comparable, if not more profound, socioeconomic and political crises. AI, like neoliberalism, produces winners and losers. Accordingly, any sustainable framework for AI governance must account not only for its productivity benefits but also for its broader social and distributive consequences.

Keywords: *AI, the right to work, Worker displacement, AI governance, Human rights obligations of states.*

Sub-theme 9: Artificial Intelligence, Ethics, and Human Futures

Assessing the Adoption and Client Perception of AI-Generated Architectural Renders in the Maldives: Usage, Preferences, and Satisfaction

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The Maldives National University

Artificial intelligence (AI) is becoming more common in architectural visualization and is changing the way architects present design ideas to clients. Although AI-generated architectural renders are increasingly used in many countries, there is limited research on their adoption and client perception in the Maldives. This study aims to examine the use of AI-generated architectural renders among architects in the Maldives, understand client preferences and satisfaction, and identify the opportunities and challenges of using AI in architectural practice. The study adopts a mixed-methods approach. Data are being collected through structured questionnaires distributed to architects and clients, together with semi-structured interviews with practicing architects. Participants are selected using purposive sampling from the architecture and construction industry in the Maldives. Quantitative data will be analysed using descriptive statistics, while qualitative responses will be analysed using thematic analysis. Initial observations suggest that AI adoption among architects may range from moderate to high, while client acceptance appears to vary depending on the quality, realism, and purpose of the renders. The completed study is expected to contribute to a better understanding of AI adoption and client perception of architectural renders in the Maldives and identify areas for future research and professional practice.

Keywords: *Artificial Intelligence, Architectural Renders, AI-generated, Construction Industry, Client perceptions*

Sub-theme 9: Artificial Intelligence, Ethics, and Human Futures

Transformation of Software Quality Assurance through Generative AI

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The integration of Large Language Models (LLMs) and Generative Artificial Intelligence (GenAI) has transformed Software Quality Assurance (SQA) by automating test creation and shifting test case generation earlier in the development lifecycle. This Systematic Literature Review (SLR) follows the PRISMA guidelines, to examine how GenAI is reshaping SQA practices. Relevant studies were retrieved from IEEE Xplore, ACM Digital Library, Google Scholar, ScienceDirect, and SciSpace. Peer-reviewed research studies investigating the application of GenAI or LLMs in software quality assurance and testing, published between 2023 and 2026 were selected based on predefined inclusion and exclusion criteria. Recent studies have shown successful application of LLMs including GPT-4 and Llama 3, in automated test case generation, intelligent test maintenance, smart contract auditing, defect analysis, and root cause identification. The reviewed studies indicate substantial improvements in testing effectiveness, with bug detection rates reaching up to 96% in smart contract analysis and code coverage exceeding 85% in end-to-end testing. However, the literature consistently highlights significant challenges, including security vulnerabilities in AI-generated code, model hallucinations, limited explainability, and a persistent trust gap among software practitioners. Overall, the findings suggest that while GenAI substantially enhances the efficiency, scalability, and intelligence of SQA, it does not eliminate the need for human expertise. Instead, the evidence supports a hybrid human–AI approach, where AI augments quality assurance activities through automation and intelligent assistance, while human judgement, domain expertise, and oversight remain essential for validation, governance, and critical decision-making.

Keyword: *Software Quality Assurance, GenAI, Large Language Models, Autonomous Software Testing, Test Automation*

Sub-theme 9: Artificial Intelligence, Ethics, and Human Futures

Artificial Intelligence in the Maldives Police Service: An Assesment of Oraganisational Readiness, Adoptation and Perception

Asiyath Didi

Artificial Intelligence (AI) is increasingly transforming policing by enhancing intelligence analysis, investigations, administrative efficiency, and evidence-based decision making. Despite these global developments, little empirical evidence exists on the organizational readiness of the Maldives Police Service (MPS) to adopt AI. This study aimed to assess AI awareness, current use, perceptions, and implementation challenges across MPS departments to establish a baseline for future policy development, capacity building, and responsible AI integration. A mixed-methods organizational case study was conducted across all 17 departments of the Maldives Police Service. Data was collected using two structured questionnaires: one administered to two senior officers from each department to capture organizational perspectives, and another administered to five operational staff members from each department to examine individual awareness, experience, and perceptions of AI. Quantitative data were analysed using descriptive statistics, while qualitative responses were thematically analysed to identify common patterns and implementation challenges. The findings indicate that AI adoption within the MPS remains at an early stage. Although all departments reported awareness of AI technologies and some level of exposure, practical use is largely limited to administrative tasks, information retrieval, and report writing, with limited application in operational policing. Key barriers include the absence of institutional AI policies, limited training opportunities, resource constraints, technical capacity gaps, and concerns regarding data governance and ethical use. Despite these challenges, participants expressed positive attitudes towards AI and recognized its potential to improve organizational efficiency and service delivery. The study concludes that the MPS has a strong foundation for AI adoption but requires coordinated governance, targeted capacity building, and strategic investment to support responsible, evidence-informed policing

Keywords: *Artificial Intelligence (AI), AI awareness, AI adaptation, Information Management, Maldives Police Service*

Sub-theme 9: Artificial Intelligence, Ethics, and Human Futures

Rethinking Legal Academia in the Age of ChatGPT: Implications for Teaching, Research, and Academic Integrity

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The emergence of generative artificial intelligence, particularly ChatGPT, has transformed legal academia by significantly improving efficiency and accessibility, while also raising concerns regarding legal reasoning, academic integrity, and the quality of legal scholarship. The objectives of this study are to examine the extent to which legal academics use ChatGPT in teaching and research, explore its benefits in enhancing legal education, scholarly research, and academic productivity, and evaluate its impact on traditional approaches to legal teaching, research, and scholarship. The methodology utilised in the research was qualitative. Data were collected through semi-structured interviews conducted with 10 legal academics at the The Maldives National University. Participants were selected through convenience sampling. The data collected was analysed through content analysis. The findings indicate that ChatGPT is increasingly being utilised by legal academics to assist in teaching and research activities. Although the extent of use varied amongst participants, it is regarded as a valuable support tool, rather than a replacement for professional expertise. The study revealed that ChatGPT offered several benefits, including enhanced teaching efficiency, improved accessibility to legal information, increased research productivity and greater opportunities for student-centred learning. Despite these advantages, the findings demonstrated that ChatGPT is influencing traditional approaches to legal teaching and scholarship, through potential erosion of critical legal reasoning skills. Participants expressed concerns regarding the accuracy and reliability of AI-generated content, academic integrity, and ethical responsibility. Overall, the study concludes that ChatGPT should be integrated responsibly into legal academia through appropriate institutional guidelines, human oversight and a continued emphasis on critical thinking, ethical scholarship and engagement with authoritative legal sources

Keyword: *ChatGPT, Generative Artificial Intelligence, Legal Academia, Academic Integrity, Legal Reasoning*

Sub-theme 10: Patient Safety and Healthcare Quality

13 Abstracts



Client Satisfaction and Perception Towards Healthcare Services at Ungoofaaru Regional Hospital

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Client satisfaction is an essential element for the healthcare industry, and the well-being of individuals. Numerous studies worldwide to determine healthcare service client satisfaction revealed immense existence. This universal problem shows multiple client satisfaction influential determinants; tangibles, reliability, responsiveness, assurance and empathy. Few studies conducted in Maldives on client satisfaction revealed that most were dissatisfied. No research on Ungoofaaru Regional Hospital has been conducted to date, and the Ministry of Health prioritizes healthcare quality and safety. Public grievances remain significance to determine whether URH provides an intendedlevel of care. Therefore, the study aimes to identify the level of service satisfaction and perception, factors influencing client satisfaction in healthcare. A hypothetical exploring any significant difference between expectations and experiences is anticipated. A cross-sectional study designwith Stratified Proportionate random sampling targeted to 15 residential islands population of Raa Atoll with 376 samples. The gap between perceived and expected healthcare services ismeasured by using a five-dimensional SERVQUAL theoretical model with modified questions established. The overall satisfaction score indicated as slightly satisfied ($\bar{x}$)3.54 out of five. The result of expected service quality ($\bar{x}$) 6.151 and perceived service quality ($\bar{x}$) 4.982. Therefore, SERVQUAL gap score ($\bar{x}$) -1.169 indicates clients are dissatisfied compared to the expectation. The hypothesis test was also accepted with a significant difference between clientexpectations and experience. The findings can contribute to healthcare managers of URH informulating quality improvement strategies for client satisfaction and healthcare outcomes.

Keywords: *Client Satisfaction, Client Perception, Service Quality, Healthcare Service.*

Sub-theme 10: Patient Safety and Healthcare Quality

Perception of patient safety culture among Nurse Managers of Indira Gandhi Memorial Hospital, Maldives: A Qualitative descriptive study

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MCGH

Patient safety is a foundational element of quality healthcare, and cultivating a strong patient safety culture (PSC) is pivotal to preventing harm and improving patient outcomes. This qualitative descriptive study explored the perception of patient safety culture among nurse managers at the Indira Gandhi Memorial Hospital (IGMH), Maldives. Using purposive sampling, the planned sample size was 8 to 10 participants. However, data saturation was reached after 6 interviews, and no additional interviews were deemed necessary. Nurse managers from various inpatient units were interviewed through semi-structured, face-to-face interviews. Data were analysed thematically using Braun and Clarke's framework with NVivo 12 software to identify patterns and themes. Findings revealed six major themes: incident reporting, prioritising patient safety, leadership commitment of nurse managers, continuous education and training, importance of teamwork and communication, and infrastructure challenges and resource limitations. Nurse managers perceived patient safety as a top priority and demonstrated strong commitment through active supervision, non-punitive approaches to incident reporting, and fostering teamwork. However, challenges such as staff shortages, inconsistent communication, limited resources, and infrastructure issues were found to hinder the establishment of a robust safety culture. The study concludes that leadership visibility, staff empowerment, and continuous professional development are key drivers of positive patient safety culture. It recommends strengthening incident reporting systems, ensuring equitable staffing, enhancing ongoing education, and addressing systemic barriers to sustain a culture of safety. These findings provide contextual insights that can inform institutional strategies and national frameworks aimed at improving patient safety in Maldivian healthcare settings

Keywords: *Patient safety culture, Nurse managers, Qualitative descriptive study, Leadership and teamwork, Healthcare safety*

Healthy Ageing Begins with Safe Healthcare: Lessons from Healthcare-Associated Infections in Critically Ill Older Adults

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The global rise in the older adult population has increased the demand for hospitalization and critical care services. While advances in medicine have extended life expectancy, achieving healthy ageing requires healthcare systems that are not only effective but also safe. Healthcare-associated infections (HAIs) remain a significant source of preventable harm among critically ill older adults due to frailty, multiple comorbidities, and frequent exposure to invasive medical devices. This study examined the burden of HAIs and their implications for patient safety, healthy ageing, and healthcare system resilience. A retrospective cohort study was conducted in a dedicated geriatric intensive care unit of a tertiary-care teaching hospital in India, including patients aged 65 years and above admitted between April and December 2024. Healthcare-associated infections, including ventilator-associated pneumonia, catheter-associated urinary tract infection, and central line-associated bloodstream infection, were analysed along with demographic characteristics and patient outcomes. Among 379 geriatric ICU admissions, 69 healthcare-associated infection episodes were identified. Device-associated infections constituted the major burden, with gram-negative organisms predominating. Patients who developed HAIs experienced significantly prolonged ICU stays and higher mortality compared with non-infected patients, highlighting the substantial impact of preventable healthcare-related harm on recovery and survival among older adults. The challenge of the 21st century is not merely adding years to life, but ensuring those years are supported by safe, high-quality healthcare. Addressing healthcare-associated infections is therefore not only an infection-control priority, but an essential investment in healthy ageing, patient safety, and sustainable healthcare systems.

Keywords: *Healthy Ageing, Healthcare-Associated Infections, Patient Safety, Healthcare Quality, Geriatric Critical Care*

Limitations of the Fault Principle in Medical Negligence in the Maldives: A Doctrinal Analysis

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This study examines the limitations of the fault-based principle in medical negligence within the Maldivian legal context, with particular focus on its ability to provide effective remedies for personal injury victims. Rooted in foundational common law authorities such as Donoghue v Stevenson and the tripartite test established in Caparo Industries plc v Dickman, negligence law requires proof of duty, breach, and causation before liability is imposed. Despite its doctrinal clarity, a significant gap exists in the application of the fault principle in practice, particularly in jurisdictions like the Maldives where victims frequently remain uncompensated. Cases such as Shareefa Hanee v Ministry of Health and Ihsan v State illustrate the evidentiary and procedural burdens that hinder successful claims, highlighting a disconnect between legal theory and remedial justice. The objective of this research is to critically evaluate whether the fault-based system in negligence adequately protects and compensates victims of personal injury in the Maldives. The study adopts a doctrinal methodology based on document analysis of primary legal sources, including case law and statutory provisions, alongside secondary academic literature, with limited comparative insights from common law jurisdictions. The findings reveal that the strict requirement of proving fault imposes a high evidentiary burden on claimants, often resulting in denial of compensation even where harm is evident. Judicial reliance on rigid tests such as Caparo Test further restricts the scope of duty of care, while issues of causation and proof exacerbate claimant disadvantage. Systemic limitations, including lack of statutory guidance, cause inconsistent outcomes, highlighting deficiencies in negligence framework and need for reform.

Keywords: *Medical injury, negligence, fault, compensation, No-fault*

Nursing Students' Perception of Quality of Clinical Placements: A Cross-Sectional Correlational Study

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Clinical placements are a vital component of nursing education, enabling students to apply theoretical knowledge in real healthcare settings and develop essential clinical competencies. This study assessed the quality of nursing clinical placements among students at the The Maldives National University (MNU) and examined factors associated with their clinical learning experiences. A cross-sectional correlational study was conducted among students enrolled in the fourth and sixth semesters of the Bachelor of Nursing and Advanced Diploma in Nursing programmes across all MNU campuses between April and May 2026. Ethics approval was sought from MNU reseaerch ethics committee. Data were collected using a self-administered structured questionnaire that included demographic data, Placement Evaluation Tool (PET), and Total clinical placement satisfaction experience. A total of 114 students participated in the study, yielding a response rate of 96%. Data were analysed using mean, t-tests, and ANOVA. The overall mean PET score was 78.43 (SD = 13.43), indicating positive perceptions of the quality of clinical placements. Students also reported high overall satisfaction with their placement experiences (M = 7.42, SD = 2.13). Significant differences in PET scores were observed by year of study, with second-year students reporting more positive experiences than third-year students (M = 80.00, SD = 11.37 vs. M = 77.20, SD = 14.82; $p = 0.04$). Overall placement satisfaction differed significantly by clinical placement area ($p = 0.04$), programme of study, with ADN students reporting higher satisfaction than BN students (M = 8.14, SD = 1.63 vs. M = 7.13, SD = 2.23; $p < 0.001$), and year of study (M = 7.80, SD = 1.73 vs. M = 7.13, SD = 2.41; $p = 0.04$). MNU nursing students reported positive clinical placement experiences and high satisfaction. Improving feedback and multidisciplinary learning opportunities may further enhance learning outcomes.

Keywords: *Clinical placement, Nursing students, Clinical Placement Evaluation tool, Learning experiences, Student satisfaction*

Sub-theme 10: Patient Safety and Healthcare Quality

Assesment Of Patient Safety Culture in Tertiary Care Hospital

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Patient Safety Culture is a critical determinant of healthcare quality and the prevention of avoidable medical errors. In tertiary care HCO, understanding the collective values and behaviours of healthcare providers are essential for systemic reform. This study aimed to assess the perceptions and dimensions of patient safety culture among healthcare providers at AIIMS Jodhpur and identify key predictors associated with a positive safety environment. A convergent parallel mixed-methods study was conducted involving 521 healthcare professionals. Quantitative data were collected using the validated AHRQ Hospital Survey on Patient Safety Culture Version 2.0. Simultaneously, 20 in-depth interviews were conducted to explore qualitative insights into the institutional safety climate. Statistical analysis was performed using SPSS (Mann-Whitney U, Kruskal-Wallis, and Logistic Regression), while qualitative data were processed via NVivo for thematic analysis. The quantitative findings revealed a moderately positive perception of safety culture, with the highest scores observed in Teamwork within Units (Median: 4.00) and Organizational Learning (Median: 4.00). Conversely, Staffing and Work Pace (Median: 3.50) and Communication Openness (Median: 3.25) were identified as significant areas of concern. Doctors reported significantly higher safety perception scores compared to nursing staff across most domains ($p < 0.05$). Logistic regression identified professional category and departmental placement (Medical vs. Supportive Services) as independent predictors of PSC perception. Qualitative themes corroborated these findings, highlighting that while interpersonal support is strong, hierarchical barriers and fear of punitive responses to error hinder transparent reporting. Studies should focus on institutionalizing non-punitive reporting systems, improving workforce distribution.

Keywords: *Patient-safety culture, Teriary care, healthcare org, healthcare professional*

Experiences of Workplace Violence Among Healthcare Staff in a Maldivian Mental Health Unit

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Workplace violence is a major occupational hazard in mental health inpatient settings, with significant physical, psychological, and professional consequences for healthcare workers. Mental health nurses and frontline staff are particularly vulnerable because of frequent exposure to aggression associated with acute psychiatric symptoms, substance use, and patient distress. Despite rising incidents within Maldivian mental health services, context-specific evidence remains limited. This qualitative component of a larger mixed-methods study explored healthcare staff experiences, perceptions, and recommendations. A descriptive exploratory design was employed. Purposive sampling was used to recruit 10 healthcare professionals from the National Centre for Mental Health Inpatient Care Unit (NCMH IPCU): 7 nurses, 2 psychiatrists, and 1 medical officer. Semi-structured in-depth interviews were conducted between 15 and 26 March 2026 to explore experiences of violence, contributing factors, impacts, reporting practices, and prevention strategies. Interviews were audio-recorded, transcribed verbatim, and analysed thematically using Braun and Clarke's six-phase framework. Five themes emerged: prevalence and severity of violence, dynamics and contributing factors, impacts on staff, organizational challenges, and prevention strategies. Violence was frequent, ranging from verbal aggression to physical assault. Contributing factors included acute psychiatric symptoms, substance use, unmet patient demands, environmental stressors, staffing shortages, and inadequate training. Impacts included fear, burnout, trauma, and reduced confidence. Systemic barriers included lack of trained security, medication shortages, underreporting, and limited organizational feedback. Workplace violence in the NCMH IPCU is frequent and multifactorial. Comprehensive organizational interventions are urgently needed to strengthen staff safety and wellbeing.

Keywords: *workplace violence, mental health inpatient care, healthcare staff, occupational safety, violence prevention*

Job Satisfaction and Associated Factors Among Acute Care Nurses at Indira Gandhi Memorial Hospital, Maldives

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Job satisfaction among nurses is a critical determinant of workforce retention, quality of patient care, and healthcare organizational performance. This study examined factors affecting job satisfaction among acute care nurses at Indira Gandhi Memorial Hospital (IGMH), Malé, Maldives. A correlational cross-sectional design was employed, and data were collected from 105 acute-care nurses using a structured, self-administered questionnaire. Job satisfaction was assessed across five domains: supervision, workplace policy, growth and advancement, benefits, and work environment. Descriptive statistics, one-way analysis of variance (ANOVA), and post hoc tests were used to analyse the data. The findings revealed that 81.9% of nurses reported high overall job satisfaction. Participants expressed satisfaction with supervision, workplace policy, growth and advancement opportunities, and the work environment, while benefits emerged as the only domain associated with dissatisfaction. Significant associations were identified between job satisfaction and demographic characteristics, including age, educational level, and years of work experience. Older nurses reported significantly higher satisfaction than younger nurses, with significant differences observed in the domains of supervision ($p = .022$), workplace policy ($p = .011$), benefits ($p = .006$), and work environment ($p = .021$). ANOVA results confirmed significant differences in overall job satisfaction across age groups ($F = 2.97$, $p = .035$). Significant differences were also observed across educational levels for overall job satisfaction ($F = 3.23$, $p = .026$), supervision ($p = .045$), workplace policy ($p = .041$), and benefits ($p = .049$), with nurses holding higher educational qualifications reporting lower satisfaction. Salary was not significantly associated with job satisfaction. These findings highlight the importance of improving employee benefits and implementing targeted retention and support strategies to enhance job satisfaction among acute care nurses in the Maldive

Keywords: *Job satisfaction, Acute care nurses, Nurse retention, Work environment, Maldives*

Distribution Shift and Model Generalisation in AI-Based Protein Stability Prediction for Healthcare Applications

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Predicting the change in protein thermodynamic stability upon single-point mutation (ΔΔG) is central to protein engineering, variant interpretation, and computational drug design. Protein language models (PLMs) have substantially advanced sequence-only prediction, yet the factors governing cross-protein generalisation, whether a model trained on one set of proteins performs well on unseen proteins, remain poorly characterised. It is unclear whether enlarging training data with additional experimental datasets reliably improves generalisation. We introduce Stability Former, a sequence-only ΔΔG predictor built on ESM2 difference embeddings and use it as a controlled instrument to investigate cross-protein generalisation. The model encodes each mutation as the element-wise difference between wild-type and mutant ESM2 embeddings, processed by a one-dimensional convolutional encoder, global pooling, and a residual multilayer perceptron. Thermodynamic anti-symmetry, ΔΔG (W T → M T) = −ΔΔG (M T → W T), is enforced exactly by construction. On the S669 blind test set, a four-fold ensemble achieves a Pearson correlation of 0.523 (95% CI 0.460–0.582), Spearman correlation of 0.572, and RMSE of 1.428 kcal/mol, outperforming physics-based methods and zero-shot PLM baselines. Through a systematic study of 19 model variants and three training-data compositions, we find that training–test distribution alignment is a stronger determinant of generalisation than training-set size: a composite distribution-shift score computed a priori from sequence and label statistics correlates with realised test performance at r = −0.971. Adding 22,729 mutations from a distribution-mismatched dataset reduced test performance, whereas a matched but far smaller dataset improved it. Distribution alignment between training and test proteins, rather than the raw dataset volume, governs cross-protein generalisation in PLM-based stability prediction. This finding provides actionable, quantitative guidance for assembling training data and designing benchmarks, and the accompanying predictor offers a principled, structure-free tool for stability assessment in protein design.

Keywords: *Protein language model, Deep learning, ESM2, Protein stability, Transfer learning*

Perception, Perceived Scope, and Barriers to Implementing the Nurse Practitioner Role in India: A Multicentre Cross-Sectional Study

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The Nurse Practitioner (NP) role has been successfully implemented in many countries and has demonstrated improvements in healthcare accessibility, quality, and cost-effectiveness. Despite high healthcare demands, physician shortages, and disparities in access to care, particularly in underserved regions, NP role remains underdeveloped in India. This study aimed to assess perceptions of stakeholders regarding the implementation of NP role in India, explore perceived scope of practice, identify potential barriers, and compare stakeholder perspectives. A multicentric cross-sectional study was conducted among 1,070 participants, including 540 patients, 415 nurses, and 115 doctors, selected through proportionate stratified sampling from five tertiary care hospitals across India. Data were collected using validated questionnaires that assessed perceptions, the scope of practice, and potential barriers. Ethical approval and informed consent were obtained. Mean age of nurses was 30.69, doctors, 43.63 and patients 38.15 years respectively. Nurses (98%) and doctors (85.2%) reported no prior experience working with NPs, doctors (53%), patients (95%) were unaware of the NP role. Despite limited awareness, participants supported NP role implementation and considered it necessary, feasible, and acceptable. Nurses reported significantly higher perceived scope-of-practice scores (54.20 ± 4.86) than patients (45.26 ± 3.45) and doctors (44.95 ± 4.25). Major barriers identified included a lack of awareness, an absence of a legal framework, inadequate policy support, unclear role definitions, limited career pathways, and limited acceptance. Stakeholders demonstrated strong support for NP role implementation in India. Establishing legislation, licensure, role clarity, career pathways, and awareness initiatives is essential for successful integration and strengthening healthcare delivery.

Keywords: *Nurse Practitioner, Advanced Practice Nursing, Scope of Practice, Barrier, perception*

The One-Minute Preceptor Model: Evaluation of Intervention Training for Intensive Care Unit Nurse Mentors

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Clinical teaching is an integral component of nursing education, enabling students to integrate theoretical knowledge into clinical practice. However, teaching in the Intensive Care Unit (ICU) is challenging due to the complexity of patients, time pressures, and urgent patient care requirements. The One-Minute Preceptor (OMP) model is a time-efficient and teaching approach for clinical teaching in busy environments such as the ICU. However, evidence regarding OMP training for ICU nurse mentors is limited. This study aims to evaluate an intervention training program on the OMP model for ICU nurse mentors. A 2-hour OMP workshop was conducted for ICU nurse mentors at a tertiary hospital in the Maldives. The workshop introduced the five micro skills of the OMP model through an interactive presentation, videos, and role-play activities with ICU-specific scenarios. Fifteen ICU nurse mentors participated in the training. Data were collected using a post-workshop Google Form comprising Likert-scale and open-ended questions. Quantitative data were analysed using descriptive statistics, and qualitative data were analyzed thematically. Most participants found the workshop excellent (60%) or very good (40%). Participants perceived it as highly relevant to their mentoring role and reported increased confidence in applying the OMP micro skills. Time constraints and workload pressures were identified as barriers to implementing the OMP model. The OMP training improved participants' confidence and preparedness for its use and integrating the OMP model may enhance the quality and consistency of clinical teaching in the ICU.

Keywords: *One-Minute Preceptor, ICU, Nurse Mentors, Clinical Teaching*

Promoting Oral Care to Prevent Hospital-Acquired Pneumonia: A Student-Led Quality Improvement Project

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Hospital-acquired pneumonia (HAP) is a common healthcare-associated infection causing substantial morbidity, mortality and healthcare costs. A 2023 report by the Advancing Quality Alliance (AQUA) estimated 82,000 HAP cases annually across NHS England, costing the NHS £1.07 billion annually. Oral care is a simple, low-cost yet often-overlooked component of HAP prevention. This student-led quality improvement project, undertaken by third-year medical students from Brunel University London in collaboration with the Infection Prevention and Control Team at Watford General Hospital, aimed to promote oral care while evaluating the impact of a poster intervention on staff awareness, patient perspectives and HAP incidence within the Acute Respiratory Care Unit. Baseline data comprised staff and patient questionnaires and patient record review. HAP was identified using predefined criteria as it was not consistently documented electronically. Staff questionnaires and HAP incidence review were repeated following the intervention. 21 pre-intervention and 19 post-intervention staff questionnaires, 15 patient questionnaires and 57 patient record reviews were completed. Staff reported variation in oral-care practice; fewer than half reported providing twice-daily oral care and almost one-third were uncertain how frequently oral health was assessed. Only 33% reported brushing twice daily during admission, while 40% felt oral care was not prioritised alongside other personal care. Following the intervention, 89.5% agreed the poster improved knowledge of oral care and its association with HAP. Although no meaningful reduction in HAP incidence was observed, the findings provide a foundation for future quality improvement through oral-care compliance audits, documentation review and longer-term evaluation.

Keywords: *Hospital-acquired pneumonia, Oral care, Quality improvement, Infection prevention, Patient safety*

Sub-theme 10: Patient Safety and Healthcare Quality

A Step Forward for Nursing: Nurses' Views on Integrating Telenursing into Healthcare Services in the Maldives

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Telenursing offers a promising avenue for extending healthcare access across the Maldives' geographically dispersed islands, yet little is known about how nurses themselves view its integration into everyday practice. This study explored registered nurses' perspectives on telenursing readiness within the Maldivian healthcare system. A qualitative phenomenological design was used, with purposive sampling to recruit thirty-two registered nurses from Indira Gandhi Memorial Hospital and Dr. Abdul Samad Memorial Hospital. Data were gathered through four focus group discussions, audio-recorded and transcribed verbatim, then analysed using Colaizzi's method. Ethical approval and informed consent were obtained prior to data collection. Four themes emerged from the analysis: telenursing as a progressive shift in nursing practice; reimagining continuous and accessible patient care; sustaining human connection despite physical distance; and the need for system-level readiness. Nurses viewed telenursing as a meaningful step toward improving healthcare access for remote island communities, strengthening continuity of care, supporting chronic disease management, and encouraging professional collaboration. At the same time, they stressed that meaningful implementation would depend on adequate training, dependable digital infrastructure, clear operational policies, institutional support, and stronger public awareness. These findings offer early but valuable evidence to guide nursing education, digital health policy, and workforce planning as the Maldives moves toward implementing telenursing services

Keywords: *Telenursing, Digital Health, Qualitative research, Nursing Practice, Maldives*

Sub-theme 11: Metabolism of Islands - Advancing an Island Circular Economy for Climate Adaptation in SIDS

13 Abstracts



Sub-theme 11: Metabolism of Islands - Advancing an Island Circular Economy for Climate Adaptation in SIDS

Beyond Siloes: Why Systems-Based Approaches Are Critical for Climate Adaptation in Small Island Developing States (SIDS)

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Two-thirds of the Sustainable Development Goals (SDGs) depend on infrastructure investment, as they are the backbone of production, consumption and our daily life, hencethe material basis of societal well-being. As economies develop, the demand for new and/orimproved services rise, such as transport, sanitation, education, and health. These servicesare delivered by infrastructure (also referred to as 'material stocks' or simply 'stocks') that drive a self-reinforcing cycle of resource consumption: to first build and then to maintainand operate the stocks, creating a "lock-in-effect". Small Island Developing States (SIDS) are on the frontlines of climate change, making adaptation increasingly urgent. SIDS suffer disproportionally from the adverse effects of global warming such as hurricanes, flooding, droughts, and sea level rise. Between 1970 and 2020, SIDS collectively lost $153 billion from extreme events, largely from infrastructure damage and the consequent breakdown of critical services. Thus, SIDS are in urgent need of infrastructure that provide adaptation service, escalating the need for hard-engineering climate adaptation measures such as seawalls, groynes, dykes, or artificial islands. However, such measures come at a high price. They drive the demand for significant quantities of materials - much of which are imported - potentially exacerbating systemic risks and creating long-term lock-in effects. This presentation will illustrate the "stock-flow-service" nexus in the context of climate adaptation in SIDS using examples from across the world. It will argue for a systems-based approach to addressing adaptation needs on SIDS, one that is economically feasible, ecologically sustainable, culturally appropriate, and socially equitable.

Keywords: *Small Island Developing States, Socio-metabolic Research, Climate Adaptation, Infrastructure, Systems thinking*

Sub-theme 11: Metabolism of Islands - Advancing an Island Circular Economy for Climate Adaptation in SIDS

How prepared is Mauritius to rising seas and climate extremes? Insights from Material Stock Analysis (MSA)

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Infrastructure forms the backbone of society by providing essential services and supporting economic activity. In Small Island Developing States (SIDS), these infrastructures are increasingly exposed to climate-related hazards, further stressors being limited land and locally available resources. Extreme weather events often cause a breakdown of critical infrastructure and disrupt important services like shelter, mobility, and healthcare. This study examines climate risks to infrastructure in the Republic of Mauritius, an Indian Ocean island nation. We use spatially explicit Material Stock Analysis (MSA) to quantify and map critical infrastructures from 2018 to 2025, including all buildings and transport infrastructure, as well as their exposure to sea-level rise (SLR), storm surges, and pluvial flooding. Two islands are considered, Mauritius and Rodrigues Island, where 90% of the population resides. Results show that for both islands buildings and transport infrastructure account for approximately 255 million tonnes (Mt) of in-use "material stock", of which 90% are buildings and 10% transport-related stocks. Around 200 and 225 tonnes per capita in Mauritius and Rodrigues respectively. Moderate sea-level rise and storm surges threaten critical sectors like transport and tourism, amounting to 2% of Mauritius's GDP. Infrastructure losses from inland pluvial flooding will impact about 50 Mt of material stocks, that amounts to approximately 14% of Mauritius' GDP. Beyond direct material losses, costly rebuilding, and lock-in to a debt-cycle are additional burdens on the economy. Nature-based defenses, appropriate spatial planning, use of local materials, and increased material recoverability potential from disaster waste can reduce risk and support more resilient development.

Keyword: *Material Stock Analysis (MSA), Small Island Developing States (SIDS), Republic of Mauritius, Climate vulnerability, Socio-metabolic Risk (SMR)*

Sub-theme 11: Metabolism of Islands - Advancing an Island Circular Economy for Climate Adaptation in SIDS

Territorial planning as a bottom-up driver of critical material flows in small island and developing states: integrating land-use through local planning documents into dynamic material flow analysis

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Islands undergoing rapid energy transitions face a critical blind spot regarding the accumulation of critical raw materials in renewable energy infrastructure. This study presents a bo/om-up dynamic material flow analysis of lithium (Li) flows in Reunion Island, covering residential battery storage, electric vehicle (EV) batteries, and grid-scale battery energy storage systems from 2010 to 2050. Unlike conventional top-down approaches that allocate national flows proportionally to the population, we introduce a novel spatial disaggregation method anchored in municipal-level land-use planning documents. Urbanoriented zones (AU) drive residential and EV demand allocation, while planning and programming guidance of renewable energy (OAP-EnR) commitments provide legally binding solar plus storage deployment targets at parcel level. Natural risk prevention plans generate forced decommissioning outflows in hazard-prone areas. The first key result shows that EV ba/eries account for 86% of the total flows, equivalent to 916 tons, according to the PPE 2030 energy planning-based scenario projected by the island. Spatial concentration of Li is striking as Saint-Paul alone holds 28% of the island's in-use Li stock (144 tons), driven by its 510 hectares of AU zones, while Saint-Denis concentrates 13% (66 tons) through its OAP-EnR commitments. These municipality-level projections can be used as a reference for waste management planning on islands and demonstrate how territorial planning instruments can strengthen material flow tracking to support climate adaptation in island territories.

Keywords: *Dynamic, material flow analysis, Critical raw materials, lithium, Island metabolism, Reunion Island*

Energy Security for the Maldives: An Investigation of Socio-metabolic Risks from 1995 to 2023

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Achieving energy security amid unpredictable global crises is a critical challenge for Small Island Developing States (SIDS). Pressures such as climate change, supply disruptions and resources shortages disproportionately impact SIDS due to structural vulnerabilities, including small size, resources and equitable distribution of critical resources, defined as Socio-Metabolic Risk (SMR), offers a systems-based lens for energy security. This study investigates the SMRs and drivers of energy-use patterns in the Greater Male' Region using a novel energy-SMR framework. An energy flow analysis of Greater Male', Maldives, was conducted accounting for energy supply and use from 1995-2023. SMRs and drivers of energy-use patterns were identified using five indicators: supply, self-sufficiemcy, affordability, consumption and access, supplemented by expert consultation. The Maldives relies heavily on imported fuels, particularly diesel, which consistently accounts for about 80% of fuel imports, revealing a dangerous lock-in. Low fuel stockholding further exposes the state to price fluctuations; fuel accounted for 24% of all imports in 2022. Energy consumption in the Greater Male' region increased fivefold since 2024, driven by the electricity and land transportation sectors, compared to a threshold increase nationally. While universal electrification was achieved in 2008, centralization in Greater Male' affects reliability and affordability nationwide. The Maldives faces energy insecurity, characterised by low self-sufficiency, price vulnerability, inefficiency and unequal distribution. This study presents a multidecadal, multilevel analysis of energy dynamics and key leverage points for strengthening resilience, highlighting the importance of island case studies

Keywords: *gender disparity, resort employment, Maldivian resorts, glass ceiling effect, women in tourism*

How Climate Resilient is Malé's Water System? An analysis of hydro-socio-metabolic risk (Hydro-SMR) from 1998 to 2024

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Water metabolism is defined by patterns of water flowing into, within, and out of a socio-ecological system to meet societal needs. Patterns of water throughput may build resilience, or embody systemic risks that cascade across spatial, temporal and sectoral dimensions. A better understanding of these patterns and their associated risks can inform climate adaptation mechanisms, improving systemic resilience for climate vulnerable geographies such as Small Island Developing States (SIDS). These risks can be understood as socio-metabolic risks (SMR), a subset of systemic risks associated with critical resource availability, circulation, and the distribution of resultant costs and benefits. This study develops the first framework to analyze SMR associated with water metabolism in a SIDS, using Malé City, the capital of Maldives as a case. Quantitative water accounts are assembled from 1998-2024 and used to develop indicators focused on consumption, self-sufficiency, availability, and access. Data is collected from government agencies, industries and household surveys. The drivers and impacts of determined system dynamics are explored through qualitative analysis supported by insights from expert interviews. Results show a fivefold increase in per capita desalinated water consumption, placing pressure on limited water supply infrastructure. Self-sufficiency remained critically low across the study period with less than 1% of desalinated water production powered by local energy resources. Water access is threatened by limited reliability and high costs that amount to 14% of monthly household income on average. Malé's water metabolism is accumulating socio-metabolic risk, highlighting the urgent need to build resilience through diversified and accessible water resources.

Keywords: *Resilience, Socio-Hydrology, Socio-Metabolic Risk, Water Metabolism, Water Security*

Exploring Water Security and Accessibility in Urban SIDS: Insights and Perspectives from Vulnerable Communities in the Male' Region, Maldives

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Climate change poses a significant threat to water security in urban coastal communities of small island developing states (SIDS), particularly in the Maldives. Rapid urbanization in the capital city of Malé has intensified critical water accessibility challenges, including saltwater intrusion and an over-reliance on desalination technologies that are inequitable, costly, and environmentally unsustainable. These interventions also exacerbate systemic risks that cascade to other sectors with varying impacts. This study examines the water accessibility experiences of vulnerable communities across the Greater Malé region. Employing the Real-World Labs (RWL) transdisciplinary approach alongside qualitative phenomenological methods, the research drew on semi-structured interviews with 30 participants representing nine vulnerable population groups. This methodology focused on the lived experiences of participants while documenting community-based adaptation strategies and identifying policy gaps and structural barriers that undermine effective implementation. The study captured grassroots water management knowledge that formal planning processes have historically overlooked. By engaging both community members and policymakers, the research sought to bridge the divide between community knowledge and water governance practice. The findings reveal that water insecurity in this context reflects a governance failure rather than a purely technical one. A four-dimensional analytical framework emerged from the data, organised around institutional and governance gaps, infrastructure and design failures, water quality and affordability concerns, and climate-related and emergency vulnerabilities. The core outputs of this study include recommendations for strengthening water governance through the integration of community knowledge and improving policy responsiveness toward vulnerable populations. The research aims to inform equitable adaptation planning and offers practical and academic insights applicable to other rapidly urbanising island nations facing comparable climate pressures.

Keywords: *water accessibility, water insecurity, Real-World Labs*

How much materials do the Maldives need to 'stay afloat'? Insights on material stock and flow dynamics for climate adaptation

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Small Island Developing States (SIDS) are among the regions most severely affected by climate change, increasing the need to implement adaptation measures. Adaptation options include hard-engineered structures, which, in the field of erosion prevention, primarily comprise two different types: coastal protection, such as breakwaters, groynes, and revetments, and land reclaiming and raising. These measures are designed to mitigate the effects of climate change as an immediate action. However, these adaptation measures are very resource-intensive, requiring materials that must be imported if they are not available locally. Rising demand for imports can lead to lock-in effects in affected regions, which may cascade into further socio-metabolic risks. Specifically, our work focuses on the adaptation pathway currently chosen by the Maldives for the period 2000–2100, by first identifying 2024 in-use stocks and second, extrapolating development scenarios and material requirements for adaptation in the future. We used a GIS-based material stock and flow analysis, which calculates the requirements for shoreline protection measures and land reclamation, including various sea-level rise scenarios and potential policy decisions. We discuss our results based on the stock-flow-service nexus, from the perspective of islands as metabolic systems which, to fulfil certain services, require corresponding stocks, and flows to build and maintain them. The results indicate that hard-engineering adaptation projects are susceptible to lock-in effects due to their resource intensity, the maintenance they require, and increasing exposure, thereby exacerbating import dependencies and other associated risks.

Keywords: *Climate adaptation, GIS-based material stock and flow analysis, Socio-metabolic risks, Small Island Developing States, Maldives*

Moving towards island circular economy: challenges, limitations, and pathways for resilience. Learnings from the case of O'ahu, Hawai'i

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Restricted by geographical characteristics such as remoteness and limited land area, small islands face multiple challenges, including import dependencies, constrained resource availabilities and limited economies of scale. Those restrictions can reduce local capacities in an island's waste management system. The sociometabolic perspective enables the identification of socio-economic drivers of socio-metabolic risks induced by a waste management system under pressure. With the Hawaiian island of O'ahu as our focal case, we apply six static ew-MFAs for the period of 1997 - 2022, in steps of five years, considering 13 input and 17 output material categories, respectively. O'ahu follows a diversified waste management strategy, including reuse, recycling off-island, waste combustion in the local Waste-to-Energy plant (WtE) and landfilling, which is the least preferred option. We consider socioeconomic and historical information to contextualise O'ahu's material flows, enabling an understanding of the relationship between policies and unexpected events on the socio-economic metabolism. Our findings suggest that examining waste management strategies on a material category level, when accounting for physical imports, exports and domestic processed output, helps to better understand potentials to close loops and increase resilience. Comparing different waste management strategies also allows to identify trade-offs in the socioeconomic metabolism of an island. We further discuss cascading effects accumulating on lower levels of the waste hierarchy, emphasizing the importance of circular economy in island geographies.

Keywords: *socio-metabolic risks, material flow analysis, Hawaii, Circular Economy, island industrial ecology*

The Reclaimed Land and the Forgotten Child: How Small Island Developing States Write, or Erase Children's Rights in Their Climate Pledges

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This study asks a question that the climate-law literature has so far answered only in fragments: when small island developing States (SIDS) write the climate pledges that the Paris Agreement demands of them, do they write children into those pledges as rights-holders, or do they write them out? Through a complete textual reading of the thirty-nine sovereign SIDS recognised by the United Nations, this paper codes each State's most recent nationally determined contribution (NDC) against an eight-part rubric developed by the author from the United Nations Committee on the Rights of the Child General Comment No. 26 (2023), the UNICEF Child- and Youth-Sensitive NDCs Toolkit (2024), and the International Court of Justice Advisory Opinion of 23 July 2025. The rubric scores each NDC on whether it (i) names children among groups exposed to climate harm, (ii) addresses child-specific sectors, (iii) anchors its commitments in children's rights doctrine, and (iv) provides for children's participation. The coding distinguishes the narrow lexical field of "child/children/childhood/infant" (and its francophone, hispanophone and lusophone cognates) from the broader "youth/young people/girls/boys" register, on the doctrinal ground that General Comment No. 26 paragraph 98(a) speaks specifically of children's rights, not of youth participation in the abstract. Four States score the full eight: Cabo Verde, Comoros, São Tomé and Príncipe and Timor-Leste. Five States score zero on every criterion, including Tuvalu, whose NDC 3.0, submitted two months after the International Court of Justice opinion, contains the term "young people" once in a commitment to age-appropriate awareness materials, and the words "child," "children," "childhood," "infant," "girl," "boy," or "adolescent" not at all. The Maldives, an early voice and a founding member of the Alliance of Small Island States, scores five of eight: thorough on vulnerability, sectors, and youth participation, but silent on the Convention on the Rights of the Child as a treaty source of its climate obligations. The regional pattern inverts what casual assumption would predict: the Atlantic, Indian Ocean and South China Sea SIDS cluster (mean 4.89) outperforms both the Pacific (2.79) and the Caribbean (2.25). The paper argues that the gap between vulnerability rhetoric and rights doctrine in SIDS NDCs is not a drafting oversight. It is a doctrinal failure that the post-2025 settlement of climate law has now made legally untenable.

Keywords: *Children's environmental rights, Intergenerational climate justice, UNCRC, nationally determined contributions, small island developing States*

Visual Securitisation in Small Island States: From Environmental to Existential Threat

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This presentation projects how Small Island Developing States (SIDS) construct security through images, using visual securitisation as a strategic mechanism to reframe climate change from an environmental concern into an immediate and existential security threat. Drawing on securitisation theory and a constructivist approach to small state security, it shows that security is socially constructed through ideas, narratives, and symbols, while emphasizing the role of small states as active actors capable of shaping international norms and security discourses. It analyses prominent examples of visual securitisation, including Maldives' 2009 underwater cabinet meeting, speeches delivered by Pacific Island leaders standing in rising seawater, and the use of satellite imagery and aerial photography to document shoreline erosion and territorial loss. These images function as securitising moves that transform scientific evidence into powerful political messages, enabling vulnerable states to communicate urgency, legitimacy, and lived experience to global audiences. By visually portraying the impacts of sea-level rise, displacement, and sovereignty erosion, SIDS challenge state-centric and militarised understandings of security and broaden the definition of existential threats. The presentation further demonstrates how visual representations generate international attention, strengthen advocacy within forums such as the United Nations and the Alliance of Small Island States (AOSIS), and support mobilization of climate finance, adaptation resources, and loss-and-damage commitments. Ultimately, it contends that visual securitisation has become a survival strategy through which SIDS exercise soft power, influence international policy, and transform local ecological vulnerability into a global ethical and security responsibility, redefining climate action as a form of national defence.

Keywords: *Visual securitization, Small Island Developing States (SIDS),Security discourse, Constructivism*

Adapting to rising seas through land reclamation: A historical institutional perspective from the Maldives

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Land reclamation is emerging as a favoured strategy for adapting to sea-level rise in atoll nations, and the Maldives is regarded as a global leader in its practice. Yet the political and institutional conditions that made large-scale reclamation possible remain poorly understood. This paper asks what institutional and political conditions have enabled the Maldives to pursue reclamation at such scale and pace, and what these reveal about barriers and enablers facing other small island states considering similar strategies. Drawing on 21 interviews with key decision-makers, architects and urban planners, alongside a review of national policy, budget and historical records from 1980 to 2023, the paper applies a historical institutionalist approach to trace how reclamation in the capital Malé evolved across successive political regimes since independence. It shows that reclamation has been inextricably linked to the authoritarian character of Maldivian politics and to rising urban housing demand driven by the tourism economy. These conditions created both a public mandate for reclamation and regimes willing to take risks, experiment, and commit to long-term works, while enabling two pivotal institutional changes: land reforms establishing private property rights, and large inflows of foreign investment into reclamation and urban development. The paper makes two contributions: empirically, it offers the first systematic account of the political-institutional foundations of the Maldivian model, challenging accounts of atoll land as a passive object of sea-level rise; theoretically, it extends historical institutionalism to authoritarian small-island contexts. Nevertheless, the Maldives model remains incomplete and may prove socially and economically unsustainable.

Keywords: *Climate Change Adaptation, Coastal Zone Management, Historical Institutionalism, Political Economy, Land Reform*

Climate change and health in Small Island Developing States: A mixed-methods systematic review

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Small Island Developing States (SIDS) contribute least to global climate change, however, disproportionately they face some of the most severe effects of it. Moreover, climate change puts people from SIDS at risk of major health risks. This review was aimed to examine the effects climate change has on the health of people living in SIDS and to identify key gaps for policy, practice and research. A systematic review was conducted using a review protocol developed based on PRISMA-P 2015, The Cochrane Handbook for Systematic Reviews, The JBI Manual for Evidence Synthesis, GRADE and GRADE-CERQual principles. WHO, UN, IPCC frameworks were utilized to identify the definitions, climate exposure categories and health-outcome framework. Studies were identified through targeted searches of PubMed/MEDLINE, PubMed Central, CINAHL, Hinari. Studies were included if they investigated climate-related exposures and health outcomes in SIDS health systems or populations. Quantitative, qualitative, mixed-methods and implementation studies were analysed narratively. 21 research reports from 20 study families were included. The studies were mainly from the Pacific and Caribbean SIDS. Climate sensitive infectious diseases such as dengue, malaria, diarrheal diseases had the strongest evidence. Studies also showed that climate change affected people's mental health, such as reduced daily functioning, eco-grief, distress and fear. Food insecurity, water scarcity, disrupted livelihoods, and reduced access to healthcare caused by climate change affected people's health. Evidence on Indian Ocean SIDS is limited. Climate change is directly and indirectly affecting the health of SIDS populations and needs immediate action. There is dire need to strengthen climate-resilient health systems, improve food and water security, and support mental health. More high-quality studies are needed.

Keywords: *Climate change, Small Island Developing States, health impacts, climate-resilient health systems, environmental health*

Living on Water? Community Perspectives on Floating Houses as an ideal means for future Housing

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Floating settlement options have served as alternative models to building on land and many options had been explored, even for the Maldives. However, the social acceptance over-water structures as a living habitat had never been researched in the Maldives. The research aims to understand whether Maldivian communities may accept Floating settlements as a medium of housing and an adaptation strategy that preserve the existing island and environmental conditions. The Main Research Question addressed in this research is: What are the Primary factors that would determine the acceptability of floating housing over typical land-based housing models? Two primary methods were employed: administration of a set of Structured Survey Questions and a semi-structured interviews that targeted to understand deeper underlying reasons for the responses. Sampling was done from 3 different islands in the Central Male' region, with approximately 40-50 participants from each island. In addition to the above, a comparative data analysis of the 3 islands was also be utilized to relate findings to contextualize the findings. Responses suggest that the acceptance of floating housing depended mostly on pre-conceived notions about floating dwellings- which wasn't always accurate. Very little was dependent on novelty ideas or quality of space. Pragmatic issues such as safety, affordability, service connectivity, availability of land etc. were more dominant. The study points out that floating settlements could be an ideal option that can be accepted by the communities should their preferences be addressed.

Keywords: *Floating Communities, Over-water structures, social acceptability, Resilient Housing, Environmental safeguard*

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