



2026
SICASH
MULTICONFERENCE

ABSTRACTS

The SLIIT International Conference on Advancements in
Sciences and Humanities

“MULTIDISCIPLINARY RESEARCH FOR SUSTAINABILITY”



09 OCTOBER 2026

SRI LANKA INSTITUTE OF INFORMATION TECHNOLOGY

SLIIT- Malabe Campus, Malabe, Sri Lanka



ABSTRACTS

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Organized by

Faculty of Humanities and Sciences



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Message from the Chancellor



I am pleased to extend my warmest congratulations and best wishes to the organizers, researchers, academics, practitioners, speakers, and participants of the SICASH 2026 Multiconference. This event will take place on October 9, 2026, at the Sri Lanka Institute of Information Technology (SLIIT). The 7th SICASH Conference and the second Multiconference hosted by the Faculty of Humanities and Sciences (FHS) mark a significant milestone in promoting research, innovation, and interdisciplinary collaboration. Under the overarching theme "Multidisciplinary Research for Sustainability," SICASH 2026 will bring together eight international conferences covering various fields, including biotechnology, education, language and culture, law and justice, actuarial sciences, nursing and allied health, biomedical innovation, and psychology.

The diverse themes presented at these conferences highlight the increasing significance of multidisciplinary approaches in tackling the complex challenges we face today. Topics range from sustainable biotechnology and future-oriented education to transformative biomedical innovation, resilient mental health, compassionate healthcare, data-driven decision-making, evolving legal systems, and sustainable language practices. SICASH 2026 offers a valuable platform for fostering connections and sharing knowledge across these various disciplines.

With over 125 full-paper presentations and approximately 16 distinguished keynote and plenary speakers, this Multiconference provides an exceptional opportunity for knowledge sharing, dialogue, and collaboration. Endorsed by several national and international professional organizations, and with partial publication support from the National Science Foundation (NSF), the significance of this scholarly endeavor is further enhanced. In addition, various pre- and post-conference symposiums and workshops will be offered.

I would like to commend the organizing committee and everyone who contributed to making SICASH 2026 a platform for academic excellence, innovation, and meaningful engagement. I am confident that the research and ideas shared during this multiconference will not only advance academic knowledge but also lead to sustainable solutions that benefit society.

I wish all participants a productive, inspiring, and enriching experience at SICASH 2026, and I wish them great success in this important celebration of multidisciplinary research and sustainability.

With sincere regards,

Prof. L. L. Ratnayake
Chairman
Sri Lanka Institute of Information Technology (SLIIT)

Message from the Vice Chancellor



I am delighted to extend my warmest greetings on the occasion of the seventh edition of the SLIIT International Conference on Advancements in Sciences and Humanities (SICASH 2026) Multiconference. Since its inception, SICASH has provided a valuable platform for researchers, academics, and practitioners to share knowledge, present emerging research, and engage in meaningful academic dialogue across a wide range of disciplines. The continued evolution of the conference reflects SLIIT's commitment to strengthening its research culture and creating opportunities for research to contribute to innovation, knowledge advancement, and the wider needs of society.

This year's theme, "Multidisciplinary Research for Sustainability," is particularly significant in the context of the increasingly complex and interconnected challenges facing the world. Many of the issues that shape our future cannot be addressed through the lens of a single discipline. Sustainable progress requires the integration of scientific discovery, technological advancement, social understanding, policy, healthcare, education, and sound decision-making. Multidisciplinary research creates opportunities to bring these different perspectives together, encouraging researchers to look beyond conventional boundaries, identify new connections, and develop solutions that are innovative, practical, and capable of creating a lasting impact. In this context, the Multiconference provides an important forum for advancing research that not only expands knowledge but also responds to the changing needs of communities and society. The breadth of disciplines represented at the Multiconference further reinforces the relevance of this multidisciplinary approach. I am also pleased to see SICASH 2026 bringing together researchers and academics from Sri Lanka, India, Malaysia, Australia, the United Arab Emirates, the Maldives, and the United Kingdom. This diversity of disciplines and international participation creates opportunities for the exchange of knowledge and perspectives across different academic and professional contexts.

It is a privilege to welcome our distinguished keynote speaker, Emeritus Professor Sally Hardy, Faculty of Medicine and Health Sciences, University of East Anglia. Her participation brings an important international dimension to the conference and will provide participants with valuable insights drawn from her extensive expertise and experience. I am confident that her contribution, together with those of the researchers, academics, and practitioners participating in the Multiconference, will enrich the discussions, stimulate thought-provoking dialogue, and encourage new avenues for collaboration and knowledge exchange.

I extend my sincere appreciation to the Pro Vice Chancellor, academic reviewers, conference chairs, and the organising committee for their dedication, commitment, and collective efforts in bringing this Multiconference to fruition. Their contribution has been instrumental in sustaining SICASH as a platform for academic exchange, research collaboration, and the advancement of knowledge. I also wish to acknowledge all the researchers, academics, practitioners, and participants whose contributions give meaning and substance to the conference. I am confident that this year's Multiconference will further strengthen SLIIT's contribution to multidisciplinary research and foster collaborations that translate knowledge and innovation into meaningful and sustainable outcomes for society.

Prof. Lalith Gamage
Vice Chancellor
Sri Lanka Institute of Information Technology (SLIIT)

Message from the Senior Deputy Vice Chancellor & Provost



It gives me great pleasure to extend my heartfelt congratulations to the organizers and participants of SICASH 2026. This prestigious academic gathering, organized by the Faculty of Humanities and Sciences (FHS), stands as a testament to our continued commitment to academic excellence, multidisciplinary scholarship, and innovative research.

This year marks the 7th SICASH Conference and the second Multiconference hosted by the Faculty of Humanities and Sciences (FHS).

Under the overarching theme, “Multidisciplinary Research for Sustainability,” SICASH 2026 brings together eight conferences: the International Conference on Sustainable Biotechnology (ICoSBi 2026), International Conference on Educational Trends and Technology (iCONETT 2026), International Conference in Language, Culture, Technology, and Autonomy (ICLACTA 2026), International Conference on Law and Justice (ICLJ 2026), International Conference on Actuarial Sciences (ICActS 2026), International Conference on Nursing and Allied Health for Sustainability (ICoNAHS 2026), International Conference on Biomedical Innovation (Biomed Frontiers 2026), and the Psychology International Conference (PSYCIC 2026).

The Multiconference will feature over 125 full-paper presentations and approximately 16 eminent keynote and plenary speakers representing diverse disciplines and research themes. workshops. The endorsement of several national and international professional bodies, together with partial funding support from the National Science Foundation (NSF) for publications, further reflects the academic significance of this conference.

It is deeply encouraging to witness the enthusiastic participation of both local and international academic communities. The Organizing Committee deserves the highest commendation for developing an engaging program comprising eminent speakers, thought-provoking sessions, and high-quality research presentations.

I extend my sincere appreciation to the Organizing Committee for their tireless dedication in making SICASH 2026 a success and warmly thank all speakers, researchers, presenters, and participants for their valuable contributions.

Prof. N. Rajapakse
Senior Deputy Vice-Chancellor and Provost
Sri Lanka Institute of Information Technology (SLIIT)

Message from the Pro-Vice Chancellor and the Dean, FHS



It is my great pleasure to welcome you to the SLIIT International Conference on Advancements in Humanities and Sciences (SICASH) Multiconference 2026.

Last year, SICASH took a significant step forward by adopting a multiconference format, bringing together several specialised international conferences under one umbrella. This year, that vision has grown further. SICASH 2026 now hosts eight conferences, all united by this year's theme, Multidisciplinary Research for Sustainability. They cover biotechnology, actuarial science, psychology, law and justice, nursing and allied health, language and culture, education, and biomedical innovation. I am delighted to share that we have received more than 125 papers for presentation. This response reflects the growing reach and reputation of SICASH among researchers in Sri Lanka and abroad.

SICASH continues to serve as a platform for knowledge exchange across disciplines, and the multiconference format makes that exchange more meaningful than ever. Many of today's most pressing challenges cannot be addressed within the boundaries of a single field, and sustainability is chief among them. I hope the conversations that begin here will lead to lasting collaborations.

I extend my special thanks to the General Chair, Professor Dhanushka Udayanga, for his leadership in bringing this multiconference together. I gratefully acknowledge the National Science Foundation of Sri Lanka for its support, as well as all our sponsors and collaborating partners. I am especially honoured to welcome Emeritus Professor Sally Hardy of the University of East Anglia, who will deliver the keynote address at the opening session. My sincere thanks also go to the distinguished keynote speakers of each of our eight conferences, and to all participants who have travelled from overseas to be with us in Sri Lanka.

I am equally grateful to all the authors who submitted their work, as your research is the foundation of SICASH. I also thank the conference chairs, organising committees, reviewers and volunteers whose dedication has made this event possible.

Thank you for being a part of SICASH 2026. I wish you all a productive, inspiring and memorable conference.

Dr. Malitha N. Wijesundara
Pro Vice-Chancellor - Faculty of Humanities & Sciences
Sri Lanka Institute of Information Technology (SLIIT)

Message from the General Chair – SICASH 2026



It is my great pleasure to welcome all delegates, keynote speakers, authors, reviewers, industry partners, students, and distinguished guests to SICASH 2026 – Multiconference, held under the theme “*Multidisciplinary Research for Sustainability*”. The seventh SICASH event and the second edition of the SICASH Multiconference represent an important milestone for the Faculty of Humanities and Sciences, SLIIT. This year, SICASH brings together eight international conferences, creating a vibrant platform for scholarly exchange across Biotechnology, Biomedical Sciences, Law, Psychology, Languages, Education, Actuarial Sciences, Nursing, and related disciplines. As one of SLIIT’s youngest faculties, we take immense pride in convening this broad and inclusive academic gathering that connects researchers, professionals, industry representatives, and emerging scholars.

The complex challenges of our time which include sustainability, health, food security, technological transformation, social wellbeing, and equitable development cannot be deeply addressed within the boundaries of a single discipline. Multidisciplinary and transdisciplinary research have therefore become essential pathways for meaningful innovation, enabling ideas, methods, and perspectives to converge in ways that generate new knowledge and practical solutions. We sincerely hope that SICASH 2026 will inspire enduring international partnerships, strengthen collaboration among institutions and regions, and stimulate research that contributes tangibly to a more sustainable future.

We are deeply grateful to the Vice Chancellor and the Management of SLIIT for their continued encouragement, confidence, and generous support in facilitating this event on such a significant scale through institutional commitment and infrastructure. We also extend our sincere appreciation to the SLIIT Research and International Division for their valuable assistance in supporting the participation and accommodation of our international visitors. The publication and knowledge-dissemination activities of SICASH 2026 are supported by the National Science Foundation, Sri Lanka, through its Support Scheme for Scientific Meetings and Events (SSSME), awarded under a competitive grants process. We are also thankful to the professional bodies and international partner organizations that have endorsed this event, making SICASH 2026 a truly collaborative international endeavour.

Our heartfelt appreciation goes to all authors who entrusted us with their valuable research, as well as to the reviewers, session chairs, keynote speakers, scientific committees, organizing teams, sponsors, and supporting staff whose commitment has made this conference possible. We remain dedicated to providing a meaningful and professional experience for every participant, while ensuring that the work presented here receives the scholarly attention it deserves.

Importantly, SICASH 2026 is also an investment in the next generation of researchers. By enabling students to engage with leading scholars, present their ideas, receive constructive feedback, and observe the diversity of contemporary research, the conference cultivates confidence, curiosity, and ambition. We hope that these experiences will encourage our students to explore new horizons, pursue impactful research careers, and contribute to an expanding culture of research excellence at SLIIT.

I wish all participants an intellectually rewarding, and memorable SICASH 2026.

Prof. Dhanushka Udayanga

General Chair - SICASH 2026

**Department of Applied Sciences, Faculty of Humanities & Sciences
Sri Lanka Institute of Information Technology (SLIIT)**

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International Conference on Sustainable Biotechnology

ICoSBi 2026

*“Bridging Research and Industry,
with Global Impact”*

Organised by

Department of Applied Sciences, Faculty of Humanities and Sciences

Sri Lanka Institute of Information Technology

Abstracts - ICoSBI

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Abstract ID: 5**Molecular characterization and fermentative capabilities of epiphytic yeast from
Spondias dulcis (Ambarella)**

O.V. Hettithanthrige¹, S.A. Mummullage¹, T.C. Serasinghe¹, L.M. Vincent¹, H.M. Shafqat¹,
G.J.B. Arachchi¹, S.N. Fernando¹, D.T. Suriyaarachchi¹, D. Pavalakumar², P.A. Sewwandi¹,
R.B.N Dharmasiri^{3*}

¹Faculty of Life and Medical Sciences, BMS Campus, Colombo 06, Sri Lanka

²Department of Biosystems Technology, Faculty of Technology, University of Sri Jayewardenepura, Sri Lanka

³Department of Plant Sciences, Faculty of Science, University of Colombo, Colombo 03, Sri Lanka

Corresponding author*: nadeemadharmasiri@pts.cmb.ac.lk

Fruits undergoing spontaneous fermentation host diverse yeast communities with potential applications in functional food production. This study focused on isolating, molecularly identifying, and assessing the bioactivity of yeasts from spontaneously fermenting *Spondias dulcis* (Ambarella) for medicinal beverage production. However, information on indigenous yeasts from spontaneously fermenting *Spondias dulcis* in Sri Lanka remains limited. For isolation, 5–7 ripe Ambarella fruits were collected aseptically from a tree in Colombo and placed in a ziplock bag. Yeast strains were isolated by serial dilution, and identification was based on colony morphology and microscopic features. Six isolates (O1, O2, O4, O7, O9, and O12) were recovered, while only O7 and O12 were molecularly identified using PCR and sequencing with ITS1 and ITS4 primers. The Electronic nose (E-nose) analysis indicated lower volatile compound intensities in experimental samples (2.9901 and 3.962) than in the commercial sample (19.995). Antimicrobial testing showed minimal inhibition (0.02–2.17 mm) against bacterial strains, while gentamicin produced larger inhibition zones (20–26 mm). No antifungal activity was detected against *Candida tropicalis* and *C. parapsilosis*, and no antagonism was observed. Anti-inflammatory activity assessed using the egg albumin denaturation assay showed an inverse concentration trend, with the highest inhibition at 6.25% (sample: 88.6%; commercial: 83.1%) and lowest at 100% (sample: 2.52%; commercial: 33.6%). Gel electrophoresis confirmed amplification for O7 and O12, with bands at 550–650 bp and 600–700 bp, respectively. Sequencing and NCBI BLAST analysis identified *Trichosporon asahii* and *Aureobasidium pullulans*, respectively, with bootstrap support above 70% in the Neighbor-Joining phylogenetic analysis. Overall, the isolated yeasts demonstrated fermentation potential, although bioactivity appeared limited under the unoptimized fermentation conditions.

Keywords: Electronic nose analysis; Medicinal beverage; Serial dilution; *Spondias dulcis*

Abstract ID: 16**Development and evaluation of a functional energy drink formulated with
pomegranate (*Punica granatum* L.) peel extract**

Dinusha Dhanapala*, Jagath Kasturiarachchi

*Department of Applied Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*Corresponding author*: dinushadhanapala7@gmail.com

Pomegranate (*Punica granatum* L.) peel is a valuable source of polyphenolic compounds and antioxidant constituents but is commonly discarded as a fruit-processing by-product. The present study aimed to develop a functional energy drink incorporating an aqueous pomegranate peel extract and to evaluate its physicochemical properties, antioxidant activity, sensory acceptability, and selected storage characteristics. Pomegranate peel powder was prepared and extracted using a hot-water infusion method at a 1:20 solid-to-solvent ratio. Three beverage formulations were prepared and coded as A, B, and C, corresponding to final peel-extract concentrations of 6, 8, and 10 mg/mL, respectively. The beverages were evaluated for pH, total soluble solids, instrumental color, turbidity, DPPH radical-scavenging activity, and sensory acceptability using a nine-point hedonic scale. Extraction yield obtained from three independent extraction-yield determinations ranged from $48.09 \pm 0.12\%$ to $62.03 \pm 0.06\%$. The initial pH values of formulations A, B, and C were 3.18, 3.03, and 3.24, respectively, while total soluble solids were 10.7, 12.1, and 14.4 °Brix. DPPH radical-scavenging activity was $36.00 \pm 18.62\%$, $40.00 \pm 2.22\%$, and $53.29 \pm 18.18\%$ for formulations A, B, and C, respectively. Sensory scores indicated that all three formulations were acceptable, with overall acceptability values of 7.45 ± 1.33 , 7.53 ± 1.44 , and 7.32 ± 1.57 for A, B, and C, respectively. Formulation B was selected for further development because it provided the highest mean overall acceptability while maintaining moderate antioxidant activity and a balanced sensory profile. After three months of storage, turbidity increased with formulation concentration, while the pH remained acidic. Microbiological analysis of formulation B after two weeks showed a total plate count of 2.7×10^2 CFU/mL and yeast and mold counts below 10 CFU/mL. Overall, the findings demonstrate the feasibility of incorporating aqueous pomegranate peel extract into a functional beverage while highlighting the need for further optimization of antioxidant characterization and long-term microbiological stability.

Keywords: Pomegranate peel; Functional beverage; Energy drink; Antioxidant activity; Sensory evaluation

Abstract ID: 17**Comparative in silico characterization of antidiabetic bioactive compounds from
*Costus speciosus***

Tharushi Bajjala*, Jagath Kasthuriarachchi, Shanitha Mirihana

*Department of Applied Sciences, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*Corresponding author: tharushibajjala@gmail.com

Controlling Type 2 Diabetes Mellitus involves suppressing metabolic and signaling enzymes, though synthetic inhibitors often cause gastrointestinal complications. While individual *Costus speciosus* constituents have been studied previously, a standardized head-to-head comparison integrating multi-target conformational clustering and pharmacokinetic profiling remains limited. This study computationally evaluated eight *C. speciosus* constituents against α -amylase (1HNY), human intestinal α -glucosidase (3TOP), DPP-4 (2ONC), and protein tyrosine phosphatase 1B (PTP1B; 4Y14). Protein structure quality was assessed via PROCHECK, and binding pockets were identified using PrankWeb. Following ligand energy minimization, rigid molecular docking was performed in AutoDock 4.2 via AutoDockTools v1.5.7 (50 runs, 2.0 Å RMSD clustering tolerance). Miglitol, Sitagliptin, and the co-crystallized PTP1B inhibitor C0A served as positive controls, with Myrcene and Glucose as negative controls. Plant sterols demonstrated stronger predicted binding affinities than the reference drugs against the digestive enzymes and DPP-4 under the docking conditions employed. Stigmasterol showed the highest predicted binding affinity against α -amylase (-9.43 kcal/mol; mean: -8.76 ± 0.51 kcal/mol) and strong affinity for intestinal α -glucosidase (-9.02 kcal/mol; mean: -8.52 ± 0.11 kcal/mol), while Tigogenin exhibited the strongest predicted affinity and 100% cluster convergence against both intestinal α -glucosidase (-9.07 kcal/mol; mean: -9.03 ± 0.02 kcal/mol) and DPP-4 (-8.64 kcal/mol; mean: -8.63 ± 0.01 kcal/mol), compared to Miglitol (-4.60 and -5.38 kcal/mol) and Sitagliptin (-7.21 kcal/mol). Against PTP1B, Eremanthin (-7.77 $\pm$ 0.00 kcal/mol; 100% cluster frequency) and Apigenin (-7.08 kcal/mol) were the strongest phytochemical binders relative to C0A (-9.29 kcal/mol). PyMOL indicated active-site hydrogen bonding (<3.5 Å). SwissADME suggested favorable predicted oral bioavailability for flavonoids and lactones without Lipinski violations, whereas sterols showed one lipophilicity violation and Stigmasterol exhibited low predicted gastrointestinal absorption. Stigmasterol, Tigogenin, and Eremanthin represent promising computational candidates requiring *in vitro* and *in vivo* validation.

Keywords: *Costus speciosus*; Type 2 diabetes; Molecular docking; AutoDock 4; SwissADME

Abstract ID: 25

Establishment and optimization of *in vitro* callus cultures of *Aquilaria malaccensis* as a platform for future agarwood secondary metabolite production

Nimasha Ranathunga*, Jagath Kasturiarachchi

Department of Applied Sciences, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: nimashadilhani31@gmail.com

Aquilaria malaccensis is a commercially and medicinally significant plant species valued for its production of agarwood, a highly demanded resin rich in bioactive secondary metabolites. However, the natural formation of agarwood is slow, unpredictable and dependent on environmental stress conditions, creating a need for sustainable alternative production strategies. This study aimed to establish and optimize an *in vitro* callus culture system of *Aquilaria malaccensis* to support future studies on agarwood-related metabolite production. Young leaf explants were cultured on Murashige and Skoog (MS) medium supplemented with different combinations of auxins and cytokinins to determine the most effective hormone treatment for callus induction. Simultaneously, surface sterilization procedures were optimized to minimize microbial contamination. The optimized surface sterilization protocol consisted of washing the explants with detergent, followed by fungicidal pretreatment with Carbendazim for 20 min at 120 rpm, treatment with 10% (v/v) sodium hypochlorite containing Tween 20 for 9 min at 150 rpm and immersion in silver nitrate solution (0.5 g/100 mL) for 4 min at 100 rpm. This protocol reduced the contamination rate to 13.33% and resulted in the highest percentage of uncontaminated cultures. Among the tested plant growth regulator combinations, MS medium containing 3.0 mgL⁻¹ 1-naphthaleneacetic acid (NAA) and 0.5 mgL⁻¹ 6-Benzylaminopurine (BAP) produced the highest explant response, with 70% leaf curling observed during initial screening. Callus formation was successfully induced on leaf explants, with early callus development observed after five weeks and mature callus obtained after nine weeks of culture. The optimized protocol enabled the establishment of healthy and reproducible callus cultures suitable for maintenance and multiplication under *in vitro* conditions. Although the present study was limited to callus establishment and optimization, the developed culture system can be utilized in future investigations on elicitor-induced production of agarwood-associated secondary metabolites and sustainable agarwood biotechnology.

Keywords: *Aquilaria malaccensis*; Agarwood biotechnology; Callus induction; Plant tissue culture; Surface sterilization

Abstract ID: 27

In silico characterization of antidiabetic bioactive compounds from Sri Lankan medicinal plant *Coccinia grandis*

Nishini Wijethunga*, Jagath Kasturiarachchi, Shanitha Mirihana

Department of Applied Sciences, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: nishiniwijethunga@gmail.com

Diabetes mellitus is a chronic metabolic disorder that affects millions of people worldwide and requires the development of effective therapeutic agents with minimal adverse effects. *Coccinia grandis* (ivy gourd) is a medicinal plant traditionally used in the management of diabetes and contains several bioactive phytochemicals with potential antidiabetic activity. This study aimed to investigate the potential antidiabetic activity of selected phytochemicals from *Coccinia grandis* using molecular docking and ADME analysis. Seven phytochemicals, namely quercetin, kaempferol, rutin, gallic acid, β -sitosterol, lupeol, and diosgenin, were docked against four diabetes-related protein targets (PDB IDs: 1HNY, 5NN3, 4Y14, and 2ZJ3) using AutoDock 4. Protein–ligand interactions were analyzed using PyMOL and Discovery Studio, while pharmacokinetic properties were evaluated using SwissADME. The docking results indicated favorable binding profiles for β -sitosterol, lupeol, and diosgenin across several targets, while the other compounds also demonstrated interactions with the target proteins. The hydrophobic compounds showed comparable binding profiles, however, differences in docking scores were interpreted cautiously due to limitations associated with docking scoring functions and ligand size. ADME analysis indicated acceptable drug likeness for several compounds, although some showed low gastrointestinal absorption. Overall, the findings provide preliminary in silico evidence for further investigation of selected *Coccinia grandis* phytochemicals for antidiabetic activity.

Keywords: *Coccinia grandis*; Molecular docking; Phytochemicals; Antidiabetic activity; ADME

Abstract ID: 29

**Molecular docking and ADMET profiling reveal *Borreria verticillata*
phytochemicals as multi-receptor inhibitors of endometriosis-associated
inflammatory pathways**

Januli Gamage^{1*}, Isini Kawshalya²¹Edgehill University, Ormskirk L39 4QP, United Kingdom²School of Life Sciences, Asian Institute of Business and Science, Colombo 00800, Sri LankaCorresponding author*: januli.visakyagamage@gmail.com

Endometriosis is a chronic inflammatory gynecological disorder affecting approximately 5–10% of women worldwide. It is characterized by the ectopic implantation of endometrial-like tissue and dysregulated inflammatory signalling involving TNFR1, TNFR2, IL-1R, and NF- κ B, which contributes to chronic inflammation and lesion persistence. Because current treatments are associated with high recurrence and limited mechanism-based action, there is a need for novel multi-target therapeutic agents. This study aimed to identify potential multi-target anti-inflammatory compounds from *Borreria verticillata* against TNFR1, TNFR2, IL-1R, and NF- κ B using molecular docking and ADMET profiling. Molecular docking revealed that ursolic acid exhibited the strongest binding affinity toward TNFR1 (–8.0 kcal/mol) and TNFR2 (–7.0 kcal/mol), while borreverine bound most favorably to IL-1R (–7.9 kcal/mol) and isoborreverine showed the strongest affinity toward NF- κ B (–7.0 kcal/mol). Hydrogen bonding dominated TNFR1 and IL-1R binding, whereas hydrophobic and π -stacking interactions were more prominent within the comparatively weaker TNFR2 pocket. Borreverine and isoborreverine formed favorable interaction profiles across multiple receptors. SwissADME predicted favorable oral drug-likeness and gastrointestinal absorption for borreverine and isoborreverine, whereas ursolic acid and stigmasterol exhibited lower predicted oral bioavailability. Toxicity assessment using ProTox 3.0 predicted relatively low acute toxicity for borreverine and isoborreverine (LD50 $\approx$ 1000 mg/kg, toxicity class 4), whereas ursolic acid, despite strong binding, raised hepatotoxicity and carcinogenicity concerns. These findings identify *B. verticillata* as a promising source of multi-target anti-inflammatory compounds for endometriosis and highlight borreverine and isoborreverine as the most promising candidates for further experimental validation, structural optimization, and formulation development.

Keywords: Endometriosis; Molecular docking; *Borreria verticillata*; ADMET; Anti-inflammatory compounds

Abstract ID: 38

Screening selected Sri Lankan rice germplasm for starch synthesizing genes and associated phenotypes

S.D. Divyanjalee^{1*}, L.H.M.Y.K. Somaratne¹, H.A.C.K. Ariyaratne²¹ Department of Agricultural Biology, Faculty of Agriculture, University of Peradeniya, Peradeniya, 20400, Sri Lanka² Department of Botany, Faculty of Science, University of Peradeniya, Peradeniya, 20400, Sri LankaCorresponding author*: senadeeradishmi97@gmail.com

Low-glycaemic index (GI) rice is an important target in Sri Lankan and International rice breeding programs due to its health benefits. Starch, the main component of rice endosperm, consists of amylose and amylopectin, with their ratio determining the GI with higher ratios leading to low GI. This ratio is primarily regulated by starch-synthesizing genes which are *Granule-Bound Starch Synthase I* (GBSS1), *Soluble Starch Synthase I* (SSS1), and *Starch Branching Enzyme I* (SBE1), all located on chromosome 6. The present study was conducted to identify genetic and phenotypic variations in amylose content in selected Sri Lankan rice germplasm. A total of 16 rice varieties were used for the analysis. Phenotyping for amylose content (AC) of those 16 varieties was done using the iodine colorimetric method. Five distinct clusters were observed, with amylose contents ranging from 1.1 % to 27.2%, including superior clusters: CIC 300(25.9%), Ceylon purple rice (26.2%), Super kernel 06 (26.7%), Red fragrant (26.8%), Bg 403(27.2%). The 16 rice varieties were screened for genetic variations targeting starch synthesizing genes using linked SSR markers Wx, SSS, and SBE. However, based on PCR fragment size on 2% agarose gels, distinct genetic differences could not be visualized among the varieties indicating the need for higher resolution genotyping methods. Bioinformatics analysis was conducted to identify variations in GBSS1, SSS1, and SBE1 using 53 Sri Lankan rice accessions from the 3000K Rice Genome Project. Two known mutations in GBSS1 (c.671A>C, c.1243C>T) were detected in 16 accessions out of 53 accessions. Five exonic mutations (c.86G>T, c.178C>A, c.220A>G, c.232G>T, c.258G>T, c.1312A>G) in SSS1 and two exonic mutations (c.545C>A, c.2156T>C) in SBE1 were identified among the selected accessions. These findings highlight significant genetic diversity in these genes within Sri Lankan rice germplasm highlighting the importance of further studies screening genetic variability in the local rice germplasm.

Keywords: Amylose content, Glycaemic index, GBSS1, SSS1, SBE1

Abstract ID: 39**Trajectory-guided machine learning identifies early NASH-associated hepatocyte states and candidate biomarkers in NAFLD**

Roshan Perera*

*Institute of Medical Genetics and Applied Genomics, University Hospital Tübingen, 72076 Tübingen, Germany*Corresponding author*: vetrosh@gmail.com

Non-alcoholic fatty liver disease (NAFLD) can progress from simple steatosis (NAFL) to non-alcoholic steatohepatitis (NASH), yet the early cellular changes associated with this transition remain poorly understood. We hypothesized that hepatocyte heterogeneity during early NAFL may reveal subpopulations that have already acquired transcriptional programs associated with later-stage NASH. To investigate this, we analyzed single-cell RNA-sequencing data from healthy, 15-week NAFL, and 30-week NASH mouse livers by integrating unsupervised clustering, Monocle3 pseudotime analysis, Random Forest classification, LASSO modeling, and differential gene-expression analysis. Trajectory analysis revealed progressive transcriptional remodeling from healthy toward disease-associated hepatocyte states. Machine-learning models trained to distinguish healthy from NASH-associated hepatocyte transcriptional states were subsequently applied to early 15-week NAFL hepatocytes. Both models identified marked cellular heterogeneity, including a distinct subset of early NAFL hepatocytes exhibiting NASH-like transcriptional signatures. Random Forest and LASSO predictions showed strong concordance (Spearman's $\rho = 0.89$), supporting consistent identification of NASH-associated transcriptional states across the two modeling approaches. Integration of pseudotime-associated genes, Random Forest feature importance, LASSO-selected features, and differential expression between high- and low-scoring 15-week hepatocytes identified candidate biomarkers including *Apoa4*, *Saa1*, *Hp*, *Lcn2*, and *Hpx*. These candidates highlighted inflammatory, stress-response, and metabolic transcriptional alterations associated with disease progression. Together, these findings demonstrate that NASH-associated transcriptional programs are detectable in a distinct subset of hepatocytes during early NAFL, before overt NASH pathology. Integrating single-cell trajectory analysis with independent machine-learning approaches provides a framework for resolving early disease-associated cellular states and prioritizing candidate molecular markers for subsequent experimental and clinical validation.

Keywords: NAFLD; NASH; Hepatocytes; Single-cell RNA sequencing; Machine learning

Abstract ID: 44

**A sweet-boost: development of a starch-based flavour system for sweetness
enhancement in industrial bakery applications**

Thusini Rathnaweera, Sashie Abeywickrema*

Sensory and Dietary Behaviour Laboratory, Department of Food Science and Technology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Gangodawila, Nugegoda, Sri Lanka

Corresponding author*: sashie.abey@sjp.ac.lk

Industrial bakery products rely on sucrose and synthetic liquid flavour systems to enhance perceived sweetness; however, both approaches present nutritional and technological limitations. Therefore, there is a need for a more stable, process-friendly alternative capable of enhancing perceived sweetness without increasing sucrose content. In this context, this study aimed to develop a starch-based enzymatically hydrolysed flavour system capable of enhancing perceived sweetness in bakery applications. Sweet potato starch from the 'Wariyapola Red' variety was enzymatically hydrolysed using a combination of α -amylase, protease, and lipase. A Taguchi orthogonal array design of experiments approach was applied, where enzyme concentration, pH, temperature, and reaction time were treated as experimental factors. Reducing sugar content for each formulation was quantified using Lane and Eynon Fehling's titration and used as the response variable for process optimisation. The optimal hydrolysis conditions (α -amylase level: 1.00% (w/v), pH: 6.0, temperature: 50°C, reaction time: 45 minutes) produced the highest reducing sugar yield and were selected as the optimal formulation. GC-MS analysis confirmed the absence of compounds of known toxicological concern. Under the experimental conditions of the present study, 6.0g of the developed system was estimated to be equivalent in sweetness to 1.7g of sucrose, representing an estimated point of subjective equality (PSE) in the muffin formulation evaluated. Overall, the findings demonstrate that enzymatically modified sweet potato starch can function as a stable, starch-based sweetness-enhancing system, offering a promising alternative to synthetic liquid flavour systems in bakery applications.

Keywords: Sweet potato starch; α -amylase enzyme; Sweetness equivalence; Bakery industry

Abstract ID: 73

Combined effects of iron supplementation and plant growth regulators on chlorosis alleviation and growth enhancement in *Dendrobium* dark purple in vitro cultures

K. Rashmi Shehana¹, Dewni Nugawela¹, Rushini Silva¹, S.V.G. Nirosha Priyadarshani^{1*}, Sriyani E. Peiris¹, Chathuri Samarasinghe²

¹Department of Applied Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

²Department of Mathematics and Statistics, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: nirosha.p@sliit.lk

Leaf yellowing is a common quality problem during orchid in vitro propagation and can reduce plantlet vigor during repeated subculturing. This study evaluated the individual and combined effects of elevated iron supplementation and plant growth regulators on growth performance, chlorophyll content, and visible chlorosis reduction in *Dendrobium* dark purple in vitro cultures. Four Murashige and Skoog medium treatments were tested: (T1) full strength, hormone free MS medium serving as the control, (T2) MS medium supplemented with elevated $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ concentration at 100 mg/L, (T3) MS medium supplemented with 0.5 mg/L 6-benzylaminopurine, 0.1 mg/L kinetin, and 0.1 mg/L naphthaleneacetic acid; and (T4) MS medium containing both elevated $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ concentration and plant growth regulators as same as the T3. Morphological observations showed clear treatment dependent differences, with T3 and T4 producing green and more vigorous plantlets with reduced visible yellowing. T4 produced more greener and vigor plants than T3. Statistical analysis confirmed significant treatment effects on root numbers, shoot numbers, leaf numbers, yellow leaf numbers, and plant height. Among the treatments, T4 produced the highest shoot number (4.64 ± 2.81), leaf number (14.9 ± 5.62), and plant height (6.00 ± 2.03 cm), while recording the lowest yellow leaf number (0.04 ± 0.19). Kruskal–Wallis analysis showed significant treatment effects on root number, shoot number, leaf number, and yellow leaf number ($p < 0.001$), as well as plant height ($p = 0.008$). Although T4 recorded the highest numerical total chlorophyll content (0.02647 ± 0.00483 mg g⁻¹ fresh weight), total chlorophyll and chlorophyll a did not differ significantly among treatments, while chlorophyll b showed a borderline significant response. These findings indicate that combined supplementation with elevated $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ and plant growth regulators were associated with improved morphological performance and reduced visible leaf yellowing in *Dendrobium* dark purple in vitro cultures. This medium modification provides a practical approach for improving plantlet quality during orchid micropropagation.

Keywords: Orchid tissue culture; Chlorosis; Iron supplementation; Plant growth regulators; *Dendrobium* dark purple

Abstract ID: 87

**Investigation of *Senna alata* (L.) Roxb. and *Senna auriculata* (L) Roxb. crude
extract in combination therapy**

Sashini Madhubhashini, Chamari Hettiarachchi*

*Department of Chemistry, Faculty of Science, University of Colombo, Colombo 03, Sri Lanka*Corresponding author*: chamarih@chem.cmb.ac.lk

Antibiotic resistance is a growing global health threat, needing exploration of plant-derived adjuvants to improve current antimicrobial therapy. This study aimed to: test the antibacterial activity of *Senna alata* root and *Senna auriculata* flower fractions against *Escherichia coli*, *Staphylococcus aureus*, *Proteus vulgaris*, and *Enterococcus faecalis*, and to evaluate their synergistic effects with penicillin and vancomycin against *E. coli*. Air-dried samples were extracted via Soxhlet (*S. alata* with methanol, *S. auriculata* with 95% ethanol) and fractionated into seven fractions using silica gel column chromatography with increasing solvent polarity. Antibacterial activity was assessed using standard agar disc diffusion assay (ampicillin positive control, methanol negative control). Disc diffusion results showed *S. alata* fractions had inhibition zones from 9.0–16.5 mm against *E. coli*, *S. aureus*, *P. vulgaris*, and *E. faecalis* and *S. auriculata* fractions ranged 8.0–16.5 mm. Synergy was evaluated using checkerboard assay against *E. coli* with fractional inhibitory concentration index (FICI) calculation. Synergism with penicillin occurred in *S. alata* 100% hexane fraction, 80% hexane:20% ethyl acetate fraction and *S. auriculata* 80% hexane:20% ethyl acetate fraction, 70% ethyl acetate:30% methanol fraction (FICI ≤ 0.5); vancomycin synergy was observed in *S. alata* 80% hexane:20% ethyl acetate fraction and *S. auriculata* 50% hexane:50% ethyl acetate fraction. Antagonism was recorded in *S. alata* 30% hexane:70% ethyl acetate fraction, 70% ethyl acetate:30% methanol fraction with penicillin and *S. auriculata* 80% hexane:20% ethyl acetate fraction and 100% ethyl acetate fraction with vancomycin (FICI ≥ 4). These findings contribute to developing plant-based combination therapies to address antibiotic resistance globally with careful selection of fraction-specific antagonism.

Keywords: Antibacterial activity; Antibiotic synergy; FICI; *Senna alata*; *Senna auriculata*

Abstract ID: 99**Value addition to tea cream: development and evaluation of tea cream-incorporated cookies**

Sandali Perera, Damayanthi Dahanayake*

*Department of Life Sciences, Faculty of Science, NSBM Green University, Pitipana, Homagama, Sri Lanka*Corresponding author*: damayanthi.d@nsbm.ac.lk

Tea cream is a colloidal precipitate formed during instant tea processing and is commonly separated from the tea extract as a processing by-product. Tea cream is frequently discarded, despite containing a significant number of antioxidants, caffeine, and polyphenols. Through its incorporation into functional bakery products, such as cookies, this study aimed to enhance the value of tea cream while evaluating its chemical, sensory, and shelf-life properties. Cookies were formulated with different percentages (%w/w) of tea cream. The most acceptable formulation was determined by sensory evaluation, and it was decided to use 2.0 % (w/w) tea cream per 100 g of cookie dough. The sensory evaluation was carried out using a five-point hedonic scale to determine the sensory attributes, including appearance, smell, texture, sweetness, saltiness, aftertaste, and acceptability of the cookies. A panel trained in sensory evaluation from the Food Technology Department of Dilmah Ceylon Tea Company PLC conducted the sensory evaluation. The sensory evaluations were recorded as mean scores. To guarantee product stability and safety, shelf-life evaluations were conducted for five months under both reference and accelerated storage settings. The cookies demonstrated improved functional properties, satisfactory microbiological stability of up to five months, and sensory characteristics. The prospect of using tea cream in the creation of health-conscious food items is highlighted by this study, which also advances sustainable food innovation by turning by-products into useful components with additional value.

Keywords: Tea Cream; Formulation; Sustainability; By-product; Cookies

Abstract ID: 110

In silico characterization of textile dye-degrading enzymes and prediction of potential microbial degraders

B. R. Vimansa Sathsarani*, Shanitha Mirihana

*Department of Applied Sciences, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*Corresponding author*: vimansasathsarani212@gmail.com

Textile dyes, particularly recalcitrant azo colorants, present severe ecotoxicological risks and resist conventional biological treatment. Developing sustainable, targeted bioremediation strategies requires preliminary screening of potential biocatalysts and microbial sources. In this *in silico* study, the binding profiles of thirteen representative textile dyes were characterized across four core dye-degrading enzyme families retrieved from the Protein Data Bank: laccase (6RI6), lignin peroxidase (LiP), manganese peroxidase (MnP, 1MNP), and azoreductase (7N2X). Target enzymes were validated via pairwise sequence alignments, catalytic and surface-accessible binding cavities were mapped, and rigid-receptor molecular docking simulations were conducted using AutoDock 4.2.6 alongside positive substrate controls (ABTS, veratryl alcohol, and methyl red) and a steric negative control (Direct Blue 1). Furthermore, function-oriented BLASTp searches against the non-redundant database mapped homologous enzyme distributions across microbial taxa. Docking simulations indicated that peroxidases yielded favorable relative binding affinities across several sulfonated and polycyclic dyes, with Acid Red 18 demonstrating prominent binding stability anchored by extensive networks of hydrogen bonds and hydrophobic contacts. BLASTp homology analysis identified high-identity homologues of oxidative enzymes within white-rot basidiomycetes (e.g., *Phanerochaete chrysosporium*) and azoreductases within bacterial hosts (e.g., *Escherichia coli*). While predicted binding affinities and sequence homology provide structural hypotheses for dye-cavity compatibility, they do not establish catalytic turnover, complete decolorization, or whole-cell degradation kinetics. Consequently, these computational findings define candidate biocatalytic targets and support a sequential anaerobic-aerobic treatment model, establishing a prioritized baseline for subsequent flexible docking, molecular dynamics, and experimental wet-lab validation.

Keywords: Textile dyes; Molecular docking; Dye-degrading enzymes; BLASTp homology; Bioremediation

Abstract ID: 145**ITS2 RNA secondary structure comparison provides insights into species delimitation in *Pestalotiopsis***

Nethra Nanayakkara*, Dhanushka Udayanga, Shanitha Mirihana

*Department of Applied Sciences, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*Corresponding author*: nethrananayakkara729@gmail.com

The genus *Pestalotiopsis* has drawn a considerable attention as plant pathogens, endophytes, saprobes, and for its potential to produce a variety of biologically significant metabolites. Plant pathogens frequently spread throughout both tropical and temperate regions with a wide host range, causing plant diseases in commercially important crops, ornamentals and forest trees. *Pestalotiopsis* species were previously categorized based on their morphological characteristics, such as spore shape, colour, and colony appearance. However, traditional classification based on morphological characteristics is challenging because of the cryptic species leading to frequent misidentification due to their convergence and plasticity. In this study, the phylogenetic relationships of selected 131 *Pestalotiopsis* species were investigated using DNA sequence data in combination with ITS2 secondary structure analysis. The nuclear ribosomal internal transcribed spacers 1 and 2 with 5.8S region (ITS), beta tubulin (TUB2), and partial transcribed elongation factor (TEF1), sequences were retrieved and aligned to construct phylogenetic trees using maximum likelihood analysis, allowing the assessment of evolutionary relationships among representative species. In addition, ITS2 RNA secondary structure analysis was conducted using predicted RNA folding models and compensatory base change (CBC) analysis for selected species from genus *Pestalotiopsis* and compared to evaluate structural variations and conserved among taxa. Phylogenetic analysis revealed the formation of distinct species clades, with several taxa showing strong bootstrap support, indicating stable evolutionary relationships. The ITS2 secondary structures exhibited the characteristic four-helix model commonly observed in fungi. Comparative analysis demonstrated that closely related species generally possessed similar structural features, whereas only a few divergent taxa exhibited noticeable structural differences. The limited incidence of CBCs in the ITS2 region suggests recent species divergence, close evolutionary relationships, and low levels of genetic differentiation within the genus. These findings demonstrate that combining molecular phylogenetic analyses with secondary structure information can enhance species discrimination and contribute to a better understanding of evolutionary relationships within this taxonomically complex fungal genus.

Keywords: Secondary structure; Compensatory base change; Multilocus phylogeny; ITS2; *Pestalotiopsis*

Abstract ID: 146

Plant-derived antioxidants in mitigating the effects of oxidative stress induced-insulin protein aggregation in Diabetes Mellitus

Dilini N. Kekulandara*, I. S. J. E. Theswa

*Department of Biochemistry, Faculty of Medicine, Wayamba University of Sri Lanka, Kuliyaipitiya, Sri Lanka*Corresponding author*: dilini@wyb.ac.lk

Diabetes mellitus is characterized by chronic hyperglycemia, primarily resulting from impaired insulin production and pancreatic β -cell dysfunction. Pancreatic β -cells are highly susceptible to oxidative stress due to their limited antioxidant defence. Increased reactive oxygen species (ROS) production in β -cells promotes oxidative stress that leads to insulin protein misfolding and aggregation. Accumulation of insulin protein aggregates in β -cells impairs insulin biosynthesis, promotes β -cell apoptosis, and increases progression of diabetes. Therefore, antioxidant-based interventions may provide a potential strategy to reduce oxidative damage and preserve insulin function. This study investigated the antioxidant potential of selected Sri Lankan medicinal plants and their ability to reduce oxidative stress-induced insulin protein aggregation. The antioxidant capacity of plant extracts in different solvent media was evaluated using standard DPPH radical scavenging assay, and their protective effects against H_2O_2 -induced insulin aggregation were assessed using an *in vitro* protein aggregation model. Selected medicinal plants demonstrated significant antioxidant activity, with methanolic extracts showing superior in radical scavenging potential. Furthermore, it was observed H_2O_2 inducing insulin aggregation in a concentration-dependent manner, confirming oxidative stress-mediated disruption of insulin protein structure. Among the tested extracts, *Cassia auriculata* (Ranawara) flower extract showed the greatest (up to 19.93%) ability to reduce insulin aggregation compared to H_2O_2 control, suggesting a protective role against oxidative protein damage. However, antioxidant capacity alone did not fully explain the anti-aggregation effects, indicating that specific phytochemicals and additional molecular mechanisms may contribute to insulin protection. These findings highlight the potential of Sri Lankan medicinal plants as sustainable sources of bioactive compounds for reducing oxidative stress-associated insulin damage.

Keywords: Diabetes mellitus; Oxidative stress; Medicinal plants; Antioxidants; Insulin aggregation

Abstract ID: 150

Application of *Chlorella vulgaris* for wastewater treatment and bioethanol production

Shanuka Perera¹, Shanitha Mirihana¹, Thavishi Chandrathilake², Hiran Herath^{1*}, Jagath Kasturiarachchi¹

¹ Department of Applied Sciences, Faculty of Humanities & Sciences, Sri Lanka Institute of Information Technology, Malabe, 10115, Sri Lanka

² Faculty of Engineering, Sri Lanka Institute of Information Technology, Malabe, 10115, Sri Lanka

Corresponding author*: hiranherath041@gmail.com

This study investigated the feasibility of cultivating *Chlorella vulgaris* in ornamental fish wastewater and cafeteria wastewater by evaluating algal growth performance, nutrient removal efficiency, biochemical composition, and the production of an ethanol-containing distillate from harvested algal biomass. *Chlorella vulgaris* was cultivated in 10 L of each wastewater type under artificial aeration and natural sunlight. Maximum growth was observed on day 10 in ornamental fish wastewater and on day 11 in cafeteria wastewater. During cultivation, biochemical oxygen demand (BOD), chemical oxygen demand (COD), phosphate, and nitrate concentrations decreased by 89%, 79%, 90%, and 92%, respectively, in ornamental fish wastewater and by 83%, 57%, 94%, and 84%, respectively, in cafeteria wastewater. Biomass production reached 3.88 g and 3.62 g dry weight in ornamental fish wastewater and cafeteria wastewater, respectively. Following fermentation and simple distillation, 18 mL and 14 mL of distillate were obtained from 2 g of biomass harvested from ornamental fish wastewater and cafeteria wastewater, respectively. The Jones reagent test indicated the presence of an oxidizable alcohol in the distillates. These findings demonstrate that both wastewater types can support *C. vulgaris* growth, biomass production, and substantial nutrient removal. However, further controlled studies are required to determine the specific contribution of *C. vulgaris* to the observed water-quality improvements and to quantify ethanol production using appropriate analytical methods.

Keywords: *Chlorella vulgaris*; Cafeteria wastewater; Ornamental fish wastewater; Microalgal biomass; Alcohol-containing distillate

Abstract ID: 168

In vitro establishment and callus induction of blueberry (*Vaccinium spp.*) using seed-derived explants

W. Veruni Apsara, S. V. G. Nirosha Priyadarshani*

Department of Applied Sciences, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: nirosha.p@sliit.lk

Blueberry (*Vaccinium spp.*) is an economically important fruit crop, but its large-scale propagation is limited by the shortcomings of conventional propagation methods. In this experiment, a protocol for seed germination and callus induction from seed explants was developed. Seed germination was assessed at five different levels of gibberellic acid (GA₃), while callus induction was performed at three different levels of 6-benzylaminopurine (BAP) on Woody Plant Medium (WPM). Among the different levels of GA₃, germination occurred only at 300 mg L⁻¹, giving a germination percentage of 34%. Germinated seedlings were successfully strengthened and used to establish four explant types for in vitro culture (Stem, Stem with cotyledon, Stem with leaves, Cotyledon). All explants produced callus under the tested conditions, and 2 mg L⁻¹ BAP produced the greatest callus growth among the concentrations tested, with initial shoot formation also observed. These findings demonstrate the potential of seed-derived explants for the in vitro establishment of blueberry and provide a foundation for future studies on blueberry tissue culture and micropropagation.

Keywords: *Vaccinium spp.*; In vitro seed germination; Callus induction; Seed-derived explants; Woody plant medium

Abstract ID: 170

**Development and evaluation of a pasteurized milk beverage enriched with
papaya, cinnamon, and turmeric**

Poojani Pieris¹, Ruvini Mathangadeera^{1*}, Madhura Jayasinghe²

¹*Department of Applied Sciences, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*

²*Department of Food Science and Technology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Nugegoda, 10250, Sri Lanka*

Corresponding author*: ruvini.ma@sliit.lk

This study aimed to develop a pasteurized milk product enriched with papaya puree, cinnamon and turmeric and to evaluate its nutritional properties, storage stability, and consumer acceptability. Four formulations were prepared with varying concentrations of cinnamon (50 and 200 mg) and turmeric (50 and 200 mg) and were evaluated through sensory analysis, physicochemical tests, and microbiological assessments. Sensory evaluation indicated that formulations with lower spice levels were preferred in terms of flavour and overall acceptability. The product maintained a relatively stable pH for up to 15 days, followed by a gradual decrease thereafter. Microbial counts remained within acceptable limits during the evaluated storage period. Nutritional analysis showed a fat content ranging from 3.16-3.50% (average 3.38%), moisture content of 16.46%, ash content of 0.60%, and a protein content of 1.9% by volume. The antioxidant activity increased with increasing milk extract concentration (1000-5000 µg/mL), indicating dose-dependent radical scavenging activity. The findings suggest that the developed milk beverage is a product with potential nutritional value and acceptable sensory characteristics with moderate shelf stability, suitable for functional food markets.

Keywords: Pasteurized milk; Functional beverage; Antioxidant activity; Shelf life; Sensory evaluation

Abstract ID: 171

Effect of maturity stage on titratable acidity of selected citrus fruits and development of a ready-to-serve beverage

Thilini Dhananjali¹, Ruvini Mathangadeera^{1*}, Madhura Jayasinghe²¹Department of Applied Sciences, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka²Department of Food Science and Technology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Nugegoda, 10250, Sri LankaCorresponding author*: ruvini.ma@sliit.lk

Citrus fruit quality and consumer acceptability are influenced by titratable acidity (TA) and changes in acidity during ripening. This study investigated the effect of maturity stage (immature, ripe, and overripe) on the TA and pH of selected citrus fruits in Sri Lanka, namely lime (*Citrus aurantiifolia*), lemon (*Citrus limon*), Heen Naran (*Citrus crenatifolia*), and sweet orange (*Citrus sinensis*), and explored their potential for developing a ready-to-serve (RTS) beverage. Quantitative acid-base titration with 0.1 M NaOH revealed species-specific variations in TA across maturity stages. Heen Naran and sweet orange demonstrated progressive reductions in TA from the immature to overripe stages, decreasing from 4.13% to 3.04% and from 3.01% to 0.61%, respectively. In contrast, lemon showed a progressive increase in TA from 5.66% to 7.54%, while lime increased from 5.89% at the immature stage to 7.43% at the ripe stage and subsequently decreased to 6.40% at the overripe stage. Statistical analysis revealed significant effects of variety ($F(3, 8) = 4348.68, p < 0.001$) and maturity stage ($F(2, 24) = 53.62, p < 0.001$), as well as a significant variety $\times$ maturity stage interaction ($F(6, 24) = 828.79, p < 0.001$). An 80:20 Heen Naran-to-sweet orange ratio supplemented with lemon, coconut water, aloe vera gel, sucralose, and potassium sorbate was selected based on sensory evaluation. The selected formulation showed the highest overall acceptability with a TA of 0.45% and a pH of 3.72. The DPPH assay indicated antioxidant activity, with an IC_{50} value of 3804.42 $\mu\text{g/mL}$, while DCPIP titration showed an ascorbic acid content of 52.74 mg/100 mL. Overall, the findings demonstrate species-specific changes in citrus acidity across maturity stages and the potential use of selected citrus fruits in developing an acceptable RTS beverage with measurable ascorbic acid content and antioxidant activity.

Keywords: Titratable acidity; Maturity stage; *Citrus crenatifolia*; Ascorbic acid; Functional beverage

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Abstract ID: 18**Forecasting monthly tea production in Sri Lanka**

Sangeetha S. Palanisamy*, Vishaka R. B. I. Rathnamalala, Hansika P. K. L. Patabendige, Ishani U. Amalage, Senuri D. R. R. Arachchige, Chandima N. P. G. Arachchige

Department of Statistics, Faculty of Science, University of Colombo, Colombo, Sri Lanka

Corresponding author*: psangeethasudharshini@gmail.com

Tea production plays a significant role in Sri Lanka's economy, making accurate analysis and forecasting essential for effective decision-making. This study examines monthly tea production data from 2015 to 2025, focusing on total production, low elevation production, and orthodox tea production. Exploratory Data Analysis (EDA) revealed clear seasonal patterns, fluctuations, and a structural decline in production after 2020. The Augmented Dickey-Fuller (ADF) test indicated that the original series was non-stationary; however, first-order differencing successfully achieved stationarity. Based on the analysis of autocorrelation and partial autocorrelation functions (ACF and PACF), several SARIMA models were identified for each series. A train -test split approach was applied to validate model performance using out-of-sample data. Model selection was based on forecasting accuracy measures, including Mean Absolute Error (MAE) and Root Mean Square Error (RMSE). The best-performing models were identified as SARIMA (1,1,1) (1,1,1,12) for total production, SARIMA (0,1,1) (1,1,1,12) for low elevation production, and SARIMA (2,1,1) (1,1,1,12) for orthodox tea production. Forecast results indicate that tea production is expected to remain stable in the short term, with seasonal increases toward mid-year. The study demonstrates that SARIMA models provide reliable and practical forecasting solutions for tea production.

Keywords: Exploratory data analysis; Time series analysis; SARIMA; Tea production; Forecasting

Abstract ID: 52**A Markov transition-matrix approach to credit risk, delinquency migration, and expected-loss prioritisation in enterprise receivables portfolios**

Anil Chandrasekaran*, Eissa M. Askar

*Business Division, Higher Colleges of Technology, Dubai, United Arab Emirates*Corresponding author*: achandrasekaran@hct.ac.ae

This paper develops an actuarial risk-modelling framework for analysing delinquency migration in enterprise accounts receivable portfolios using anonymised data from an electronics distributor and retailer operating in the United Arab Emirates. The company name and account identifiers are masked due to confidentiality requirements. The study addresses how overdue exposure changes over time, how accounts migrate between delinquency states, and how transition-based indicators can support expected-loss prioritisation. Account-level receivables data from six reporting periods were classified into Not Due, 1–15 days, 16–30 days, 31–60 days, 61–90 days, and 90+ days overdue states. Portfolio aggregation, Markov-style transition matrices, concentration analysis, and a probability-of-default proxy were used to convert operational receivables data into forward-looking credit-risk indicators. Across the observed period, total outstanding exposure was approximately 169.15 million, of which 54.12 million was overdue, producing an overall overdue ratio of 31.99%. December recorded the highest overdue ratio at 47.86%, while November recorded the lowest overdue balance at approximately 5.22 million. The transition matrix shows strong severe-delinquency persistence, with 60.83% of 90+ accounts remaining in 90+ in the next observed period. Early-stage delinquency also shows cure potential, with 28.57% of 1–15 accounts returning to Not Due. The findings demonstrate that receivables aging data can be transformed into actuarial-style risk measures that support provisioning review, collection prioritisation, and data-driven financial decision-making.

Keywords: Actuarial statistics; Credit risk; Markov transition matrix; Delinquency migration; Expected loss

Abstract ID: 108**Exploring dynamic spillover effects among the banking sector, equity market, and exchange rate in Sri Lanka**

Oleena Kulatunga^{1*}, Mayumi Perera¹, Ninuri Aldeniya¹, Sahan Fernando² & Chathuri Samarasinghe¹

¹*Department of Mathematics and Statistics, Sri Lanka Institute of Information Technology, Malabe, 10115, Sri Lanka*

²*Visiting Lecturer, Department of Mathematics and Statistics, Sri Lanka Institute of Information Technology, Malabe, 10115, Sri Lanka*

Corresponding author*: oleenakulatunga@gmail.com

Dynamic spillover effects refer to the time-varying, interconnected impacts among financial markets. The interconnectedness of Sri Lanka's banking sector, equity market and exchange rate has not been examined as a unified system, making this an important empirical gap. Thus, this study investigates dynamic spillover effects among these three markets using daily data on a constructed banking sector index, the All-Share Price Index (ASPI) and the USD/LKR exchange rate from 2005 to 2025. The empirical approach combines static Diebold–Yilmaz connectedness analysis, frequency-band decomposition and Time-Varying Parameter Vector Autoregressive (TVP-VAR) connectedness, alongside GARCH-family models to examine conditional volatility and assess volatility spillovers. The return series were stationary, exhibited non-normality, serial dependence and volatility clustering. Results show that the Bank–ASPI link is the dominant transmission channel: the banking sector was a net receiver of shocks, while ASPI was a net transmitter of return and volatility spillovers. During normal periods, the exchange rate was largely self-determined in the return system, although it acted as a modest net transmitter of volatility shocks. Connectedness was highest at the long-run horizon, indicating stronger spillover effects over time. Dynamic connectedness was highly time-varying and strengthened significantly during the overlap of the Global Financial Crisis and the final phase of the Sri Lankan civil conflict, the COVID-19 pandemic and the 2022 economic crisis. Dynamic total connectedness indices were 23.85% for returns and 20.41% for volatility, exceeding the static values of 20.99% and 16.23%. Findings emphasise the value of connectedness measures for systemic risk monitoring in Sri Lanka.

Keywords: Diebold-Yilmaz; Dynamic spillovers; Financial connectedness; Sri Lanka; Systemic risk

Abstract ID: 113

**An integrated early warning framework for macroeconomic shocks and crises
detection using a resilience index filtering technique: evidence from Sri Lanka**

Kavindu Gayashan*, Kaveesha Dayarathna, Dewmi Pamoda, Jayani Navodya, Suresh de Mel

Department of Mathematics and Statistics, Faculty of Humanities and Sciences, SLIIT, Malabe

Corresponding author*: kavindu0813@gmail.com

This study develops a comprehensive Early Warning framework to identify macroeconomic shocks and crises in Sri Lanka by integrating a Macroeconomic Resilience Index (MRI), a Modified Hamilton Filter, and a signal-based warning system. Annual data from 1980–2024 were collected from the Central Bank of Sri Lanka, the World Bank, and the Sri Lanka Tourism Development Authority. Thirteen macroeconomic indicators covering external, fiscal, monetary and financial, and real economy and structural sectors were selected to represent the multidimensional nature of macroeconomic resilience. Principal Component Analysis (PCA) was applied to construct the MRI by extracting weighted components from standardized variables. The Modified Hamilton Filter was used to identify macroeconomic shocks and crisis periods through a dynamic threshold approach. Subsequently, the Signal Extraction Method determined optimal thresholds for leading indicators, and a Weighted Composite Indicator (WCI) was developed to generate crisis warning signals. The findings show that the MRI effectively captures Sri Lanka's long-term resilience patterns, while the Modified Hamilton Filter identifies major economic downturns. Tourism, fiscal balance, external debt, exchange rate volatility, and foreign direct investment demonstrate strong crisis predictive ability, whereas inflation and monetary indicators provide weaker signals. The sectoral WCI analysis indicates that the external sector provides the strongest early warnings, followed by fiscal and real economy sectors. These findings highlight the importance of strengthening external and fiscal resilience and establishing a national EWS to improve policy preparedness and crisis prevention.

Keywords: Crisis detection; Early warning system; Macroeconomic resilience index; Modified Hamilton filter; Macroeconomic shocks

Abstract ID: 123

Analysis of the dynamic relationships among tourism receipts, FDI inflows, and constant GDP in Sri Lanka: a vector error correction modelling approach

Akarshani P. Rajakaruna*, Kavini M. Herath, Chathumi K. Cooray, Lasindu K. Liyanage, Sarath Peiris

Department of Mathematics and Statistics, Faculty of Humanities and Sciences, SLIIT, Malabe, Sri Lanka

Corresponding author*: akarshanirajakaruna999@gmail.com

Sri Lanka relies on tourism receipts and foreign direct investment (FDI) as important sources of foreign exchange, capital, and service-sector development, yet their joint interaction with real economic output has received limited attention. This study examines whether tourism receipts, FDI inflows, and constant gross domestic product (GDP) maintain a stable long-run equilibrium and how they interact in the short run. Quarterly observations covering 2002-2025 were analysed using exploratory statistics, Augmented Dickey-Fuller and Phillips-Perron unit-root tests, lag-order selection, Johansen cointegration, a vector error correction model (VECM), Granger causality tests, residual diagnostics, and impulse response functions. The Johansen trace and maximum-eigenvalue tests identified one cointegrating relationship. In the normalised long-run equation, tourism receipts were positively and significantly associated with FDI inflows, whereas the GDP coefficient was not statistically significant. The error-correction coefficient for FDI was negative and significant, indicating that the previous quarter's disequilibrium was corrected through FDI adjustment. Tourism receipts also responded significantly to disequilibrium, while GDP did not. Granger causality revealed bidirectional predictive links between tourism receipts and FDI and unidirectional causality from GDP to FDI. The model showed no residual serial correlation and remained dynamically stable, although non-normality and heteroskedasticity were present. The findings support coordinated policies that connect high-value tourism development with targeted FDI while strengthening resilience to economic and external shocks.

Keywords: Cointegration; Constant GDP; Foreign direct investment; Tourism receipts; Vector error correction model

Abstract ID: 162

An integrated econometric and real options framework for post-harvest vegetable marketing

Kavindu Jayanath*, Sanjeewa Perera¹, Hasitha Erandi

Centre for Mathematical Modeling, Department of Mathematics, University of Colombo, Colombo, Sri Lanka

Corresponding author*: kavindutj88@gmail.com

Price variability in vegetables is an ever-present threat for small-scale farmers in developing agricultural markets. Wholesale prices for vegetables in Sri Lanka have been characterised by seasonal variability related to Yala and Maha monsoon seasons. This research aims to address the information gap related to quantitative decision-support tools for post-harvest vegetable sales decisions by developing two data-driven tools: the Forward Contract Pricing Tool and the Value of Waiting Tool, based on wholesale carrot prices sourced from the Nuwara Eliya Economic Centre (2008-2025). The tools can be applied universally for any vegetable with an available price history.

Keywords: Agricultural price volatility; Forward contract pricing; Real options; Datar Mathews method; Post-harvest decision-making

Abstract ID: 163

**Forecasting monthly inflation in Sri Lanka: examining the dynamic effects of
macroeconomic variables**

Sanudi Dinethma*, Chamod H. Samarawickrama, Thanuri H. Fernando, Himadi P. Siriwardana, Malika L. Guruge

Department of Mathematics and Statistics, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: sanudijayawardhana@gmail.com

This study aims to develop a predictive model for monthly inflation rates in Sri Lanka using historical inflation data and to examine short term and long-term relationships between inflation rates and key macroeconomic variables. Monthly inflation data from 2008 to 2025 was considered for this study along with fourteen exogenous variables. Principal Component Analysis (PCA) was used to reduce the fourteen exogenous variables into three main components. The Augmented Dickey-Fuller and Phillips-Perron tests were used to examine stationarity, while the ARDL bounds test was used to identify the long-run and short-run relationship between inflation and the principal components. For historical inflation data, ARIMA–ARCH and XGBoost models were fitted. The ARIMA(2,1,0)–ARCH(1) model was selected after a significant ARCH effect was identified. XGBoost was developed using lagged and rolling inflation variables. For 2025 test period, XGBoost recorded the lowest RMSE of 2.8636, MAE of 2.2290 and MAPE of 157.817% among ARIMA, XGBoost and ARIMA–ARCH models. The results show that XGBoost provided better forecasting performance for the historical inflation data, while PCA and ARDL helped to identify the main explanatory factors and their short-run and long-run relationship with inflation.

Keywords: ARDL; ARIMA–ARCH; Inflation forecasting; PCA; Sri Lanka; XGBoost

Abstract ID: 164

The synergistic impact of global shocks and domestic amplifiers on food inflation regimes in net food importing countries: a panel ordered probit analysis

Sajini Gamage^{1*}, Randunu Gunasekara¹, Rashmi De Mel¹, Sasanthi Koswaththa¹, Ruwan Jayathilake², Sarath Peiris¹

¹*Department of Mathematics and Statistics, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*

²*School of Business, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*

Corresponding author*: sajinikavinharagamage123@gmail.com

Food inflation severely impacts net food importing economies, as they lack domestic agricultural buffers and are highly exposed to global market volatility. This study investigates the transmission of global supply-side shocks and domestic macroeconomic amplifiers into severe food inflation regimes within these vulnerable nations. Utilising a Panel Ordered Probit model, the research analyses monthly data from January 2003 to May 2025 across 20 net food importing countries, categorising food inflation into low, moderate, and high regimes. The findings reveal that for net food importers, international food price movements are predominantly mediated through direct energy logistics and currency shocks. Brent crude oil price spikes and exchange rate depreciation act as extreme cost-push catalysts, increasing the probability of severe food inflation by 25.6% and 41.0%, respectively. Furthermore, excessive broad money growth serves as the primary domestic amplifier, raising high inflation probabilities by 72.7%, while climate induced structural disruptions further erode baseline resilience. The study concludes that transitioning to a high food inflation regime is driven by the combined impact of global energy costs, logistical bottlenecks, and internal monetary expansion. To safeguard food security, net food importing nations must prioritise stringent domestic monetary discipline, build strategic physical buffer stocks, and accelerate climate resilient agricultural investments to insulate domestic markets from external commodity volatility.

Keywords: Food inflation; Net food importing countries; Global shocks; Panel ordered probit; Structural shocks

Abstract ID: 165

**Comparative evaluation of statistical and machine learning approaches for
monthly tea yield forecasting in Sri Lanka's Up-Country region using fertilizer
and climatic factors**

Ravish C. A. H. M. K. Athapaththu*, Asitha M. R. B. C. Dassanayake, Poorna K. M. S. Kalupahana, Uthayakumar Birunthan, Malika L. Guruge

Department of Mathematics and Statistics, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, Sri Lanka

Corresponding author*: ravishkavinda3@gmail.com

Tea is a principal agricultural export of Sri Lanka and a major source of rural employment, but its productivity is increasingly threatened by climate variability and inconsistent fertilizer supply. This study forecasts monthly tea yield in the Up-Country growing region (Nuwara Eliya and Badulla districts) using fertilizer application rate, temperature and rainfall as predictors. Monthly secondary data spanning 2015 to 2025 ($n = 132$) were obtained from the Sri Lanka Tea Board, the National Fertilizer Secretariat and the NASA POWER database. Descriptive statistics, stationarity tests (ADF) and Granger/Toda-Yamamoto causality tests were applied to all variables. Four model types were compared for forecasting performance: ARMA, ARMAX, a Generalized Additive Model (GAM), and XGBoost, using EViews and Python. Rainfall and temperature each exhibited significant bidirectional causality with tea yield, whereas fertilizer rate did not Granger-cause yield. Among the linear models, ARMAX(12,9), which combined fertilizer rate with climatic variables, outperformed the univariate ARMA model (RMSE = 0.182, MAPE = 1.02%), with fertilizer rate emerging as a significant positive predictor. The lagged GAM achieved the strongest out-of-sample fit among all models (test $R^2 = 62.9\%$) and identified temperature as the dominant nonlinear driver of tea yield, followed by fertilizer rate and rainfall. XGBoost improved substantially after hyperparameter tuning (test R^2 from 30.9% to 42.8%) but still showed signs of overfitting. Combining agronomic and climatic predictors improves tea yield forecasting relative to univariate models, offering actionable guidance for fertilizer scheduling, climate-adaptive plantation management and policy planning in the Sri Lankan tea sector.

Keywords: ARMAX; Generalized additive model; Granger causality; Tea yield forecasting; XGBoost

Abstract ID: 166

**Political uncertainty and stock market responses in Sri Lanka: evidence from
event studies and structural breaks**

Chamod Fernando*, Rusini Bogoda, Tharindi Promodya, Chamod Jayawikrama, Suresh de Mel

Department of Mathematics and Statistics, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, Sri Lanka

Corresponding author*: chamodeshann12820@gmail.com

Political uncertainty is a significant source of information and risk in financial markets, particularly in emerging economies. This study examines the short-term and long-term response of the Sri Lankan stock market to major political and economic developments between 2009 and 2025. Using daily continuously compounded returns on the All Share Price Index (ASPI), the study combines an event-study framework with structural-break and stability diagnostics. Abnormal returns (AR) and cumulative abnormal returns (CAR) were estimated using a mean-adjusted return model over short ($-5, +5$) and extended ($-30, +30$) event windows for seventeen major political and economic events. Bai–Perron multiple structural-break tests, Chow breakpoint tests, and CUSUM/CUSUMSQ stability tests were applied to the full return series to assess broader regime change. The Bai–Perron procedure identified two structural breaks, in 2011 and 2020, dividing the sample into three regimes, while CUSUM and CUSUMSQ confirmed instability in both the mean and variance of returns. Chow tests showed that significant structural change was concentrated around five events, including the 2019 sovereign rating downgrade, the 2020 constitutional amendment, the 2022 political crisis, and the 2024 presidential election. Event-study results were heterogeneous: several events produced significant short-window abnormal performance, while others emerged only over the extended window. Major political transitions, including the resignation of President Gotabaya Rajapaksa and the 2024 presidential election, generated strong positive abnormal returns. The findings show that short-term abnormal reactions and structural change do not necessarily coincide, offering a more complete picture of how political uncertainty shapes stock-market behaviour in an emerging market.

Keywords: Political uncertainty; Event study; Structural breaks; Abnormal returns; Emerging markets

Redefining actuarial learning with generative AI

Aayush Sancheti*

ACTEX Learning, New Delhi, India

Corresponding author*: aayush@actexlearning.com

Generative AI has become an everyday study companion, yet most actuarial students use it in shallow, ad hoc ways. The tools are neutral. Whether they deepen understanding or merely shortcut it depends on how deliberately they are used. This session offers a practitioner's view of turning generative AI into a disciplined learning partner. It starts with the mindset shift from denial or panic to productive adoption. It then covers the human role in AI-assisted study: framing questions, supplying context and checking outputs for hallucinations. We then explore use cases from actuarial exam preparation: (1) generating exam-style questions calibrated to syllabus weightings; (2) AI-tutor ecosystems that diagnose topic-level weaknesses; (3) structured pre-reading with ChatGPT and Claude; (4) source-grounded Q&A using NotebookLM. Live demonstrations and reusable prompt templates give attendees techniques they can apply immediately. We close with a snapshot of how universities, actuarial societies and education providers are adopting generative AI, drawing on recent SOA Research Institute findings.

Keywords: Actuarial education; Artificial intelligence

Actuarial education & AI: paradox to practice

Joana Amorim*

ACTEX Learning, USA.

Corresponding author*: joanna@actexlearning.com

As AI becomes infrastructure rather than a novelty, actuarial education faces a critical paradox: while AI can raise the floor on basic fluency and productivity, it risks lowering the ceiling of higher-order reasoning skills that define actuarial expertise. This session translates cross-disciplinary teaching guidance (Harvard, Columbia CTL, Caltech CTLO) and sector evidence (IAA, IFoA, CAS, SOA) into practical mechanics for actuarial courses and actuarial professional development. Framed by recent research on AI's dual cognitive effects in education and practical adoption patterns in insurance, we reflect on these topics using productive oxymorons. We then introduce an Enhancement/Erosion Matrix that maps where to leverage AI (documentation, code scaffolding, feedback) and where to lock down human-only work (derivations, oral defenses, transfer tasks). We will ground the session in concrete examples from today's actuarial education market—university courses and exam-prep programs—and preview near-term shifts likely to occur over the next 2 years.

Keywords: Actuarial education; Artificial intelligence

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Abstract ID: 24**The mediating role of resilience in the relationship between childhood adversity and alcohol use**

Azma K. Mohamed*, Lucy Oldfield

*Department of Psychology, Goldsmiths, University of London, WC1E 7HU, United Kingdom**Corresponding author - azma.mohamed@hotmail.com

Research has found that the presence of adverse childhood experiences can increase the likelihood of the harmful consumption of alcohol. However, resilience was found to be preventive of alcohol use. This study investigated the mediating role of resilience in the relationship between childhood adversity and alcohol use among 78 university students of whom 40 were males and 38 were females, within the ages of 18-50 years in the United Kingdom. The study employed a cross-sectional quantitative design and used validated self-report measures of childhood adversity, resilience and alcohol use. Data was analysed using initial correlations and hierarchical regressions, followed by a final mediation analysis to test the primary hypothesis. The study also controlled for the effects of age and gender to isolate the unique effects of childhood adversity on alcohol use. The results revealed a significant relationship between childhood adversity and alcohol use ($\beta = .213, p = .039$), and a significant negative relationship between resilience and alcohol use ($\beta = -.19, t(75) = -2.24, p = .028$). Resilience failed to mediate the relationship between childhood adversity and alcohol use ($\beta = .033, p = .274$). This study shows that gender and age are better predictors of alcohol use, however, adding childhood adversity provides incremental validity to the hypothesis. Given the cross-sectional design, causal or temporal relationships cannot be established. Future longitudinal research with larger and more diverse samples is needed to examine how resilience and other adaptive processes may influence alcohol use following childhood adversity.

Keywords: Childhood adversity; Adverse childhood experiences; Resilience; Alcohol use

Abstract ID: 33**AI mental-health support tool use, user perceptions, and psychological well-being among university students in Sri Lanka: a cross-sectional study**Malisa Kashmira^{1, 2*}, Rusiru Galagoda³¹University of West London, St Mary's Rd, London, W5 5RF, United Kingdom²ANC Education, 416 R. A. De Mel Mawatha, Colombo 00300, Sri Lanka³University of Sri Jayewardenepura, Sri Soratha Mawatha, Gangodawila, Nugegoda, 10250, Sri LankaCorresponding author*: malisakashmira@gmail.com

The increasing use of artificial intelligence (AI)-enabled mental-health support tools has created new opportunities for accessible psychological support, but empirical evidence from Sri Lankan university settings remains limited. This cross-sectional quantitative study examined associations between the use of AI-enabled mental-health tools, user perceptions of these tools, and psychological well-being among 150 undergraduates recruited through convenience sampling from a government university in the Western Province of Sri Lanka. Data were collected using a structured self-administered questionnaire comprising demographic and usage items, a 10-item scale adapted from the Technology Acceptance Model to assess perceived usefulness and ease of use, and an 18-item adapted Ryff Psychological Well-Being Scale. Descriptive statistics, Pearson correlation analyses, and multiple linear regression were performed. AI-tool perception scores were positively associated with psychological well-being ($r = .52, p < .001$), while usage frequency was also positively associated with well-being ($r = .38, p < .001$). The regression model was statistically significant, $F(2, 147) = 38.4, p < .001$, explaining 34.3% of the variance in psychological well-being ($R^2 = .343$). Both usage frequency ($\beta = .22, p = .003$) and AI-tool perception ($\beta = .45, p < .001$) were independently associated with psychological well-being scores. These findings indicate associations between AI mental-health tool use, favourable user perceptions, and psychological well-being; however, the cross-sectional design does not establish causality or therapeutic effectiveness. Multi-site and longitudinal research, alongside controlled studies evaluating effectiveness and safety, is needed to establish the contextual suitability of AI-enabled mental-health support within Sri Lankan university populations.

Keywords: Artificial intelligence; Digital mental health; Psychological well-being; University students; Technology acceptance model (TAM)

Abstract ID: 37**School mental health initiative as an effective preventative measure**

Dinu Siriwardana*, Rumalie Gunawardena, Madonna Solomon, Giselle Dass

*Child, Adolescent and Family Services (CAFS), Boralessgamuwa, 10290, Sri Lanka.*Corresponding author*: dinusulakshana@gmail.com

Child and adolescent mental health is a critical global public health concern. In low- and middle-income countries (LMICs) like Sri Lanka, youth face compounding socio-environmental stressors, yet severe service gaps persist. Sri Lanka's existing school-based mental health infrastructure remains constrained by an under-resourced, reactive biomedical model that often relies on untrained subject teachers acting as counsellors, creating ethical friction and barriers to trust. This paper presents the Child, Adolescent and Family Services (CAFS) Tri-Pillar School Mental Health Programme as a means of transitioning from basic crisis management to proactive prevention. This model synthesises the public health architecture of the Multi-Tiered System of Supports (MTSS) with Bronfenbrenner's Ecological Systems Theory. It delivers nested interventions across three dimensions: Pillar 1 (General Mental Health Promotion), Pillar 2 (Early In-House Counselling and Risk Assessments), and Pillar 3 (Specialised Multisectoral Referral Pathways). Multi-school implementation demonstrated localised efficacy in separating academic structures from therapeutic boundaries. However, significant systemic barriers emerged, including challenges in maintaining ethical practice, a tendency for schools to seek reactive crisis-driven support rather than sustainable preventive care, structural communication barriers, and deep-seated cultural stigma surrounding mental health. The CAFS Tri-Pillar framework offers a sustainable, culturally informed paradigm shift for school mental health from reactive to preventative care.

Keywords: Child and adolescent mental health; School mental health programme; multi-tiered mental health program; Holistic care; Preventative mental health care

Abstract ID: 55

Dimensionality and reliability of the Sinhala brief self-control scale: a confirmatory factor analysis among Sri Lankan young adults

Navodi Silva^{1*}, Naren Deepan Selvaratnam^{1,2}

¹*School of Psychology, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*

²*Faculty of Graduate Studies, University of Colombo, Colombo 07, 00700, Sri Lanka*

Corresponding author*: navodissilva@gmail.com

The present study examined the dimensionality and reliability of the Sinhala version of the Brief Self-Control Scale (BSCS) among Sri Lankan young adults. A sample of 388 participants with a mean age of 23.00 years ($SD = 3.39$) completed the 13-item scale. Internal consistency was acceptable ($\alpha = .783$), indicating adequate reliability for research use. Exploratory factor analysis (EFA) suggested a three-factor structure, which was further evaluated using confirmatory factor analysis (CFA) against one- and two-factor alternatives. CFA results indicated that the three-factor model demonstrated the most favourable model fit ($CFI = .915$, $TLI = .893$, $RMSEA = .056$, $SRMR = .045$), as well as lower AIC and BIC values than the competing models. The identified factors were interpreted as 'impulse control,' 'self-discipline,' and 'self-regulatory strain,' with the first two factors consistent with previous international BSCS validation research. Overall, the findings support a multidimensional representation of self-control in the Sinhala BSCS and provide preliminary psychometric support for its use among Sinhala-speaking Sri Lankan young adults, while highlighting the need for further validation across diverse populations.

Keywords: Self-control; Brief self-control scale (BSCS); Psychometric validation, Confirmatory factor analysis; Impulse control; Self-discipline; Self-regulatory strain

Abstract ID: 58

**The Good Child Burden: Identity, Emotional Labour, and Filial Obligation among
Sri Lankan Young Adults**

Claudia Wishmie*, Wathsala Ranwala

School of Psychology, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: claudia.w.psych@gmail.com

In collectivist Sri Lanka, cultural expectations of filial obligation place notable emotional demands on young adults co-residing with parents, framed against macro-level background factors such as the 2022 economic instability. This study proposes the concept of the 'Good Child Burden' as a tentative, culturally grounded sensitising lens to understand the psychological strain that emerges when personal identity becomes fused with inherited familial roles and duty-bound expectations. The study explores (1) how Sri Lankan young adults experience emotional labour in fulfilling filial expectations, and (2) the psychological consequences and negotiation strategies that arise from these experiences. Using Interpretative Phenomenological Analysis, semi-structured interviews were conducted with five female undergraduates aged 21-24 who co-reside with their parents. Four superordinate themes illustrating a provisional experiential pattern: The Good Child Trap (identity fused with obligation), The Unspoken Words (habitual emotional withholding to protect parents), Between Duty and Desire (constrained autonomy in major life decisions), and Now I Understand (retrospective cognitive reframing through empathy or protective detachment). Through qualitative interpretative lenses of deep and surface acting, participants' accounts revealed widespread concealment of distress where silence was frequently framed as an act of love. While retrospective cognitive reframing offered emotional relief, core relational dynamics frequently remained unchanged. Findings suggest that filial piety operates as a lived paradox in which love and emotional cost coexist, generating quiet but cumulative psychological costs. This study highlights the need for culturally sensitive clinical approaches that acknowledge relational bonds while validating young adults' emotional distress within collectivist contexts.

Keywords: Good child burden; Filial piety; Emotional labour

Abstract ID: 63

**Digital escapism among Sri Lankan young adults: a reflexive thematic exploration
of coping and well-being**

Sandini Ayagamage*, Wathsala Ranwala

School of Psychology, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: sandinishakya@gmail.com

Digital escapism is a contemporary form of escapism where digital media serve as the main outlet for relief or avoidance. The rapid growth of social media, online gaming, and recreational apps has made digital retreat a common coping strategy among young people. Increasing reliance on virtual spaces to manage stress, belonging, and identity has positioned digital escapism as a central feature of contemporary youth well-being. Yet the complexity of these digital experiences and the ways they shape coping and well-being remain underexplored. This study employed reflexive thematic analysis to explore how Sri Lankan young adults (aged 18–25) engage with digital escapism within collectivistic cultural norms, intense academic pressures, and limited access to mental health resources. Semi-structured interviews with eight participants revealed three main themes: (1) Structural pressures and unmet needs driving digital retreat, (2) The intention–behaviour gap, and (3) Digital escapism as a double-edged coping strategy. Findings highlight that while digital retreat offered temporary relief and a sense of belonging, it also reinforced cycles of avoidance, guilt, and diminished emotional resilience. Importantly, self-suppressive forms of escapism, often framed as maladaptive in Western literature, appeared culturally adaptive in Sri Lanka, enabling emotional regulation. This study underscores the need to situate digital coping practices within cultural frameworks, challenging universalist assumptions about maladaptive strategies and clarifying the nuanced role of digital media in youth well-being.

Keywords: Digital escapism; Reflexive analysis; Young adults; Coping; Sri Lanka

Abstract ID: 69

Living in the shadow of conviction: an interpretative phenomenological study of families of homicide offenders

Yenuli Weeramanthrie*, Wathsala Ranwala

School of Psychology, Sri Lanka Institute of Information Technology, Malabe, 10115, Sri Lanka

Corresponding author*: meharaweeramanthrie@gmail.com

The consequences of homicide affect not only offenders and victims but also the immediate family members of offenders. Family members often experience significant psychological, social, and emotional challenges; however, their lived experiences remain underexplored within the Sri Lankan cultural context. This study explored the experiences of immediate family members of homicide offenders in Sri Lanka. This study used Interpretative Phenomenological Analysis (IPA) with semi-structured interviews conducted among five participants. The analysis identified three interconnected themes relating to participants' social experiences, sense of self, and ways of managing the consequences of the conviction. Findings indicated that participants experienced social judgement, rejection, and blame that extended beyond the offender and shaped their sense of identity and belonging within the community. Participants continuously renegotiated family roles and self-understanding while attempting to manage the emotional and social consequences of the conviction. Coping emerged as an ongoing process of endurance shaped by emotional control, spirituality, limited social support, and everyday survival strategies. The findings provide insight into how stigma and social reactions influence identity and coping among families of homicide offenders. This study contributes to the limited literature on offenders' families in Sri Lanka and highlights the need for culturally sensitive psychological and social support systems for affected families.

Keywords: Homicide offenders; Family experiences; Stigma; identity Reconstruction

Abstract ID: 71

Making sense of ambiguous loss: the experiences of family members of police officers missing during the 1990s Sri Lankan conflict

Rivinma Sethini*, Lakmal Ponnampereuma

School of Psychology, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: rivinmaw@gmail.com

The disappearance of police officers during Sri Lanka's civil conflict left many families living for decades without confirmation of their relatives' fate. This study explored how family members of police officers who went missing during the 1990s made sense of prolonged uncertainty and unresolved loss within the Sri Lankan post-conflict context. Interpretative Phenomenological Analysis (IPA) was used to examine the lived experiences of seven family members, including wives, siblings, and a mother of missing police officers. Data were generated through semi-structured interviews and analysed ideographically before examining patterns of meaning across participants' accounts. The analysis identified an enduring experience of living with uncertainty, in which hope for the missing person's return coexisted with continuing emotional pain. At the same time, participants had been required to reconstruct their lives around the absence, taking on altered family responsibilities and adapting disrupted life trajectories without definitive resolution of the loss. Cultural and spiritual practices provided ways of sustaining hope, making meaning, and living with uncertainty, while participants' accounts also reflected a continuing search for institutional recognition and acknowledgement. The findings suggest that adaptation to ambiguous loss does not necessarily involve achieving closure; rather, participants continued to live with unresolved absence while rebuilding their lives around it. The study highlights the relational, cultural, and institutional dimensions of ambiguous loss and the importance of culturally responsive psychosocial support and meaningful institutional recognition for families of missing persons in post-conflict settings.

Keywords: Ambiguous loss; Interpretative phenomenological analysis; Missing police officers; Post-conflict; Sri Lanka

Abstract ID: 78

Trauma, psychological barriers, and pathways to healing marital therapists' perspectives on sexual dissatisfaction among married couples in Sri Lanka

Thamali C. Wickramaarachchi^{1*}, Lakmal Ponnampereuma²

¹*Faculty of Graduate Studies, University of Colombo, Colombo 07, Sri Lanka*

²*School of Psychology, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*

Corresponding author*: tcw93312thamali@gmail.com

Sexual dissatisfaction in marriage is influenced by cultural, relational, and psychological factors, yet unresolved trauma remains underexplored in South Asian contexts. This qualitative study examined how Sri Lankan marital therapists understand trauma-related sexual dissatisfaction and how these understandings shape practice. Eleven marital therapists, sex therapists, counsellors, and clinical psychologists with at least five years of experience participated in semi-structured interviews. Data were transcribed, anonymised, and analysed using reflexive thematic analysis. Therapists conceptualised trauma-related sexual dissatisfaction not primarily as impaired sexual functioning or relationship conflict, but as disruption of emotional, bodily, and relational safety. Unresolved trauma was understood to appear through avoidance, fear, and embodied protective responses that partners often misinterpreted as rejection. Recovery involved rebuilding safety through individual trauma-informed work, partner psychoeducation, communication, and culturally responsive practice before restoring sexual intimacy. The findings support a conceptual model of Trauma-Informed Relational Safety, in which sexual recovery emerges from restored safety rather than direct attention to sexual performance. The study offers a culturally grounded account of trauma-informed marital therapy and practical implications for strengthening trauma-responsive approaches to marital sexual wellbeing in Sri Lanka.

Keywords: Sexual dissatisfaction; Childhood trauma; Trauma-informed relational safety; Marital therapy; Reflexive thematic analysis; Sri Lanka

Abstract ID: 92**Preliminary psychometric evaluation of the Sinhala visceral sensitivity index**

Viduni Atapattu*, Lakmal Ponnamparuma

*School of Psychology, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*Corresponding author*: viduniatapattu@gmail.com

Gastrointestinal symptom-specific anxiety (GSA) is an important psychological factor associated with symptom severity in disorders of gut-brain interaction. However, culturally appropriate instruments for assessing GSA are not currently available for Sinhala-speaking populations. This study aimed to translate and culturally adapt the Visceral Sensitivity Index (VSI) into Sinhala and to conduct a preliminary evaluation of its psychometric properties among Sri Lankan young adults. The VSI underwent forward and back translation, followed by refinement through a two-round Delphi process involving three subject matter experts. Content validity was assessed through expert ratings, while construct validity and internal consistency were examined among 160 undergraduate students using exploratory factor analysis (EFA), Cronbach's alpha, and McDonald's omega. Expert evaluation indicated excellent overall content validity. EFA using minimum residual extraction supported a single-factor solution: all 15 items showed meaningful factor loadings, and the retained factor explained 44.90% of the variance. The Sinhala VSI also demonstrated excellent internal consistency (Cronbach's $\alpha = .92$; McDonald's $\omega = .92$). These findings provide preliminary evidence supporting the content validity, unidimensional structure, and internal consistency of the Sinhala VSI among Sinhala-speaking young adults. Further validation in independent, diverse, and clinical samples is warranted before broader clinical application.

Keywords: Gastrointestinal symptom-specific anxiety; Visceral sensitivity index; Psychometric validation; Exploratory factor analysis; Content validity

Abstract ID: 105**Family approval and relationship satisfaction in Sri Lankan intra-faith Hindu relationships: a thematic analysis**

Bairavee Kanthanesan*, Nilanga Abeysinghe

*School of Psychology, Sri Lanka Institute of Information Technology, Malabe, 10115, Sri Lanka*Corresponding author*: bairaveek@gmail.com

Romantic relationships in collectivist societies are shaped not only by the two partners but also by family expectations, religious identity, and social hierarchy. Relationships between individuals who share the same religion but differ in caste, religious subgroup, or related cultural backgrounds appear to be underexplored in Sri Lankan psychological research. This study explored experiences of relationship satisfaction and family approval among young Hindu adults in socially stratified intra-faith romantic relationships. Relationship satisfaction was understood as a participant-described experience rather than a quantitatively measured construct. A qualitative design was used with a purposive sample of seven Hindu participants aged 18–30 years who were currently involved in such relationships. Semi-structured interviews were conducted and analysed using thematic analysis. Three themes were identified: formation and emotional meaning of romantic relationships; cultural and identity negotiations within intra-faith relationships; and family authority and coping within a collectivist context. Participants described emotional intimacy, mutual support, commitment, and reconciliation as contributing to their experiences of relationship satisfaction, while caste expectations, cultural differences, and family opposition were associated with distress, secrecy, and uncertainty regarding marriage. Participants responded through compromise, strategic waiting, support from peers or extended family, and, in some cases, assertions of personal autonomy. Shared religious identity provided common ground but did not necessarily remove caste-based boundaries. The findings highlight how these relationships were negotiated within family and sociocultural contexts and indicate the relevance of culturally sensitive support for young adults navigating competing relational and family obligations.

Keywords: Caste; family approval; Intra-faith relationships; Relationship satisfaction; Sri Lanka

Abstract ID: 130

Between care and cost: young adults' experiences of providing informal mental health support in Sri Lanka

Sasvi Sooriyaarachchi^{1, 2*}, Kaushi Jayawardena¹

¹*School of Psychology, American National Institute (ANC), Colombo 03, 00300, Sri Lanka*

²*School of Psychology, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*

Corresponding author*: sithmya@gmail.com

Young adults in resource-constrained countries such as Sri Lanka may be particularly vulnerable to mental health difficulties, and many appear to turn to informal social networks rather than formal services for support. While the relationship between social support and mental health has been widely studied, far less is known about those who provide that support. This study explored the experiences of Sri Lankan young adults who support peers experiencing mental health challenges. A qualitative design was used, with face-to-face and online interviews conducted among eight purposively sampled participants aged 20-35. Data were analysed using thematic analysis to identify recurring patterns and meanings within participants' accounts. Three key themes emerged: (1) motives for helping, (2) emotional and moral dilemmas in helping, and (3) helper-recipient dynamics. Findings suggest that informal helping relationships are emotionally complex and may be shaped by cultural expectations and interpersonal values. The study points to the need for greater public awareness of mental health and for equipping young people with the skills to offer safe, effective peer support while protecting their own well-being. It also suggests that integrating informal support systems with formal mental health services could offer a more holistic and sustainable approach to addressing youth mental health needs.

Keywords: Mental health, Social support, Informal Helping, Peer Support, Young Adults

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Abstract ID: 26

The best interests of the child in cross-border custody disputes: assessing the adequacy of Sri Lanka's legal framework

Dinithi Balage*

*¹Faculty of Law, KIU University, Battaramulla, Sri Lanka*Corresponding author*: lb110a23759@kiu.ac.lk

Child custody disputes which involves parties from different jurisdictions present unique legal challenges, particularly when balancing traditional private international rules with the need to safeguard the welfare of the child. The principle of best interests of the child has emerged as a crucial tool in both international law as well as domestic legal systems. This study examines the adequacy of Sri Lankan legal system in upholding the best interests of the child in cross-border custody disputes. It aims to address the following research questions: to what extent does the Sri Lankan law protect the best interests of the child in cross-border custody disputes and whether the existing legal framework is adequate to effectively resolve such disputes while maintaining to uphold the principle. The research adopts a qualitative doctrinal methodology analysing Sri Lankan legislation, case law, international conventions and legal instruments from other jurisdictions to provide a comparative perspective. The study finds that although the Sri Lankan courts most often prefer to recognise the best interests of the child as the paramount consideration in custody disputes, its application may create significant legal and procedural challenges. While the existing legal framework of Sri Lanka provides a foundation for protecting children's welfare, it is insufficient to effectively address the complexities of cross-border custody disputes. Accordingly, the study recommends legislative reforms to better align the law with international standards to strengthen the protection of children's best interests in cross-border custody proceedings.

Keywords: Best interests of the child; Cross-border custody disputes; Child rights; Sri Lankan legal framework

Abstract ID: 42

**Algorithmic accountability in automated decision-making: assessing the need for
a statutory right to explanation under Sri Lanka's Personal Data Protection Act
No. 9 of 2022**

Ruhansi Fernando*, Dahamsa Peiris, Kavithaki Senevirathna

¹School of Law, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: ruhansifdo05@gmail.com

Artificial intelligence and algorithmic decision-making have considerably transformed personal data processing. Automated systems now influence decisions concerning credit, employment, insurance, digital services, consumer profiling and administrative processes. Although such systems may improve efficiency and consistency, they raise concerns regarding opacity, unfairness, discrimination and accountability. Sri Lanka's Personal Data Protection Act No 9 of 2022 establishes a modern framework based on lawfulness, transparency, fairness, accountability and data-subject rights. However, although the Act recognises automated individual decision-making, it does not expressly establish a statutory right to explanation. This paper examines whether the Act, as amended by the Personal Data Protection (Amendment) Act No 22 of 2025, adequately ensures algorithmic accountability and whether legislative recognition of an explanation right is necessary. It also distinguishes solely automated decisions from materially AI-assisted decisions. The study employs doctrinal legal research supported by a structured comparison of the European Union, United Kingdom and Singapore. It finds that the Sri Lankan framework contains significant accountability mechanisms, including transparency duties, access and review rights, automated decision-making safeguards, personal data protection impact assessments and regulatory oversight. Nevertheless, these mechanisms do not clearly guarantee meaningful explanations of individual outcomes. The paper demonstrates that transparency, accountability and explanation are related but legally distinct safeguards. It concludes that a carefully defined statutory right to explanation, applying to solely automated and materially AI-assisted decisions producing legal or comparably significant effects and balanced against innovation, trade secrets and technical feasibility, would strengthen legal certainty, procedural fairness, contestability and data-subject protection in Sri Lanka's emerging digital economy.

Keywords: Algorithmic accountability; Automated decision-making; Right to explanation; Human review; Personal data protection

Abstract ID: 46

A need to revisit the doctrine of the right of innocent passage for warships in light of artificial intelligence

G. Vedharagini *

Department of Law, Faculty of Arts, University of Jaffna, Jaffna, Sri Lanka

Corresponding author*: veytharahineganeshalingam@gmail.com

The right of innocent passage (RIP) constitutes one of the fundamental principles of the law of the sea, which permits ships of all states to navigate through the territorial waters of another state provided such passage is innocent. This doctrine seeks to balance two competing interests namely, the sovereign rights of the coastal state and the international principle of freedom of navigation. Although the doctrine appears well established, its application to warships remains to be one of the controversial questions in international maritime law. While the major naval powers argue for the unrestricted Right of Innocent Passage for warships, number of developing and least developed countries argue that it should be subject to limitations as it threatens the security of the coastal states. This divergence can also be interpreted as a reflection of broader geopolitical tensions between major naval powers and states with minor maritime powers. The debate became more intense as a result of integration of artificial intelligence (AI) into warships, since even though the use of AI has emerged as a crucial asset in naval operations owing to its capacity to surmount the immense expanse, unpredictable nature and hostile conditions of the oceanic environment, it increases the challenges pertaining to warships, especially for the developing and least developed states. And also, it should be noted that, United Nations Convention on Law of the Sea was negotiated during an era, when warships were exclusively crewed commanded and crewed by human officers. Thus, when AI steps in, the prevailing framework obviously lacks a clear regulatory system, calling for a revisit of this doctrine. Based on these grounds, a need arises for the revisiting of Right of Innocent Passage for warships.

Keywords: Innocent passage; Artificial intelligence; Warships; Law of the sea; Maritime law

Abstract ID: 47**Platform work and labour rights in Sri Lanka: ensuring decent work in the era of the gig economy**

A.A. Chaminya Adikari*

*University of Moratuwa, Bandaranayake Mawatha, Moratuwa 10400, Sri Lanka*Corresponding author*: aachaminya@yahoo.com

The expansion of digital platforms has transformed labour markets globally and facilitated the emergence of gig economy as a significant source of employment and income generation. In Sri Lanka, platform-based work has expanded through taxi or ride providing services, food delivery services, online freelancing platforms and other digitally mediated work arrangements. While such arrangements offer workers greater flexibility and access to new economic opportunities, they also challenge traditional labour law frameworks that were designed around conventional employer and employee relationships. Existing labour legislations in Sri Lanka primarily extends protection to employees/workers who satisfy the legal definition of “an employee” or “a workman” and has created an uncertainty regarding the legal status of platform-based workers. This paper examines the extent to which existing labour laws in Sri Lanka could be applicable to platform-based workers and evaluates the adequacy of current legal protections relating to wages, job security and social protection. The study adopts a doctrinal legal research methodology, analyzing Sri Lankan labour legislation, international labour standards and comparative legal developments relating to platform work. The Study concludes that a more appropriate approach for Sri Lanka is to adopt a hybrid regulatory framework consisting of two complementary layers of protection. First, it is worthwhile to preserve the existing legal framework for determining employment status, allowing courts and Labour Tribunals to assess whether a platform worker is, in substance, an employee by examining the actual working relationship rather than the contractual designation adopted by the platform since still Sri Lanka is in very younger stage of platform work. Secondly should establish, through specific legislative provisions, a minimum set of rights applicable to all gig and platform workers irrespective of whether they qualify as employees or independent contractors, including appropriate social-security protection, occupational safety and health safeguards, transparency in remuneration and algorithmic management, fair procedures for deactivation, and access to dispute-resolution mechanisms.

Keywords: Gig economy; Platform-based workers; Employee; Worker; Independent contractor; Labour rights

Abstract ID: 51

**Corporate autonomy and judicial intervention in Sri Lanka: an analysis of the
articles of association and the lifting of the corporate veil**

B.L.D. Dasalya*

*Attorney-at-Law*Corresponding author*: blddasalya@gmail.com

This research article critically investigates the importance of articles of association under Sri Lanka's Companies Act No. 7 of 2007 in determining a company's internal structure and authority. The Articles of Association serve as a company's constitutional instrument, providing shareholder rights and obligations, governing management structures, and defining the scope of corporate decision-making authority. While the Act accepts the Articles as an internal contract that gives corporations great autonomy, this authority is not absolute. The doctrine of separate legal personality, established in *Salomon v A Salomon & Co Ltd*, reinforces the corporate entity's independence; however, courts retain the authority to lift the corporate veil in exceptional circumstances, such as fraud, sham transactions, or abuse of corporate personality. This research analyzes the relationship between internal business autonomy and external court intervention, determining whether Sri Lankan law strikes an effective compromise between these competing values. It assesses judicial approaches to veil lifting and if such intervention jeopardizes the constitutional purity of the Articles of Association. The study contends that, while Sri Lankan law conceptually maintains a balance between autonomy and responsibility, practical uncertainty in court application may undermine the predictability of corporate regulation. As a result, it concludes that, while the legislative structure is generally appropriate, more explicit judicial direction would improve consistency and strengthen the balance between corporate autonomy and external control.

Keywords: Articles of association; Corporate autonomy; Separate legal personality; Lifting the corporate veil; Judicial intervention

Abstract ID: 56

Criminal disclosure and fair trial rights in Sri Lanka's criminal justice system in the digital age: a comparative study of the United Kingdom and Sri Lanka

Oshadhi Kanda Durage*

Independent Researcher

Corresponding author*: 413oshadhi@gmail.com

Sri Lanka's criminal disclosure framework remains anchored in colonial-era legislation: the Evidence Ordinance 1895, the Code of Criminal Procedure Act 1979, and, for terrorism cases, the Prevention of Terrorism Act 1979. No statute imposes a proactive obligation on the prosecution to disclose unused material that might undermine its case or assist the defence. Although Sri Lanka is a State Party to the ICCPR and has enacted the ICCPR Act 2007, its criminal procedure does not provide a comprehensive statutory disclosure regime capable of giving full practical effect to the defence-preparation guarantee in Article 14(3)(b). This paper argues that Sri Lanka stands at a critical juncture, a moment of law in transition, and that the enactment of a statutory criminal disclosure regime modelled on the United Kingdom's Criminal Procedure and Investigations Act 1996 and Criminal Justice Act 2003, which is only applicable to England and Wales, is the missing legislative reform. Drawing on England and Wales's experience, including systemic failures exposed by the collapse of *R v Allan* [2017] and the challenges of digital evidence management, the paper demonstrates that Sri Lanka's existing framework cannot satisfy contemporary fair trial standards without fundamental statutory reform.

Keywords: Criminal disclosure; Criminal procedure; Evidence ordinance; Criminal justice

Abstract ID: 57

Hostile voluntary offers and de facto control: identifying and bridging technical gaps in Sri Lanka's Takeovers and Mergers Code 1995

Hirudini Wickramanayake*

Department of Legal Studies, Faculty of Business, NSBM Green University, Mahenwatta, Pitipana, Homagama, 10200, Sri Lanka

Corresponding author*: hirudini.w@nsbm.ac.lk

Sri Lanka's Company Takeovers and Mergers Code 1995, amended once in 2003, was drawn from the London City Code yet has stood still while every comparable regime around it has been rebuilt. The research question this paper pursues is a practical one: how should the Code be reformed so that it can cope with hostile voluntary offers and with control exercised in substance rather than in form? Two weaknesses are examined. The first is definitional. The Code nowhere defines 'control', so an acquirer who assembles real authority through nominees, trusts or private arrangements while staying beneath the 30 per cent line owes the minority nothing. The second is structural. Rule 34, the nearest thing the Code has to an anti frustration rule, activates too late, covers too little and binds only one side of a hostile contest. Using doctrinal and comparative methods, the paper measures the Code against the UK Takeover Code as amended in December 2023, the Malaysian Code on Take-Overs and Mergers 2016 with its Rules revised in 2021 and supplemented by statutory amendments effective January 2026 and the Indian SEBI Substantial Acquisition of Shares and Takeovers Regulations 2011 as amended to 2025. Each comparator has answered these problems through a workable definition of control, a general anti frustration principle and calibrated regulatory discretion. The paper concludes that three precise amendments, all achievable under the Securities and Exchange Commission of Sri Lanka Act No 19 of 2021, would restore parity with regional standards and give minority shareholders the protection the Code has always promised.

Keywords: Takeovers; De facto control; Hostile offers; Securities regulation; Comparative law

Abstract ID: 70

Extraterritorial evacuations of non-nationals in armed conflict: a legal duty under international law?

Navini Premalal*

Department of Legal Studies, Faculty of Business, NSBM Green University, Mahenwatta, Pitipana, Homagama, 10200, Sri Lanka

Corresponding author*: navini.p@nsbm.ac.lk

Evacuations during armed conflict are usually framed as emergency movements that remove people from immediate danger. Yet recent conflicts show a recurring protection gap: states often evacuate their own nationals while similarly situated non-nationals remain trapped, refused at borders, or excluded from evacuation zones. This paper asks whether international law can impose an extraterritorial duty on third states to protect or evacuate non-nationals during armed conflict. Using a doctrinal legal method, it analyses international humanitarian law, refugee law and international human rights law, with particular attention to non-refoulement, jurisdiction and effective control. Although IHL also requires third states to 'ensure respect' for the Geneva Conventions under Common Article 1, it does not, by itself, create a general third-state evacuation duty. Refugee law may protect evacuees who reach a border and satisfy the refugee definition or non-refoulement threshold. Human rights law may also impose duties where a third state exercises effective territorial or personal control. However, those who cannot reach a border or evacuation zone remain weakly protected. The paper concludes that existing law recognises only limited and contingent duties, and that future legal development should move toward a broader protection framework based on functional control and the right to have rights.

Keywords: Extraterritoriality; Evacuation; Armed conflict; Non-refoulement; Effective control

Abstract ID: 102**When government speaks online: rethinking legitimate expectation in light of official website representations**

Disandi Gamage*

*Faculty of Law, General Sir John Kotelawala Defence University, Ratmalana, 10390, Sri Lanka*Corresponding author*: disandigamage07@gmail.com

With the advancement of technology, digitalization of public administration has significantly transformed the official government communications. Official websites and digital platforms are increasingly used to communicate official information, thereby raising concerns on the applicability of the doctrine of legitimate expectation. The doctrine of legitimate expectation under administrative law has evolved to protect the promises and the consistent practices ensuring that the discretionary powers of public authorities are exercised fairly. Thus, its applicability to the communications made by online platforms remains legally uncertain. This research analyzes the circumstances where the representations made by government websites constitute legally enforceable legitimate expectations. In this context, the central legal issue is whether the communications made by online platforms give rise to legally enforceable legitimate expectations where the representations made are unclear, subsequently modified or withdrawn. The paper specifically analyzes reliability and the public reliance of the government websites in giving rise to legitimate expectations and how courts ensure the fairness of government decisions when websites present inaccurate or misleading information. Adopting a doctrinal methodology, the paper points out that the doctrine of legitimate expectations should be evolved to address the digitalization of public administration. Based on the analysis of contemporary legal frameworks, judicial decisions and scholarly literature, the paper concludes that the existing doctrine of legitimate expectation should be modified in the presence of digitalized governance and highlights the need for a more structured legal framework where the judiciary can ensure the fairness of digital governance by balancing the legitimate expectations and overriding public interest. This research contributes to a broader discussion on law in transition by redefining the doctrine of legitimate expectations in context of digital governance and thereby promotes public trust and the certainty of law.

Keywords: Administrative law; Digital governance; Government websites; Legitimate expectation; Public trust

Abstract ID: 112

**Supported treatment and state power: a Dworkinian evaluation of Sri Lanka's
Draft Mental Health Act 2026**

Akash Dinendra*, Prineetha Bandaranayake

Faculty of Law, University of Colombo, Colombo, Sri Lanka

Corresponding author*: akash@law.cmb.ac.lk

The Sri Lankan Draft Mental Health Act of 2026 (Draft Act) seeks to replace the custodial system of inpatient treatment introduced under the Mental Diseases Ordinance, No. 27 of 1956 (Mental Diseases Ordinance). It introduces a rights-based model of supported treatment, governed by statutory thresholds, procedural safeguards and institutional oversight. While contemporary scholarship has explored compulsory mental healthcare in terms of human rights and autonomy, the legal justification for State power in supported treatment under the Draft Act is still underexplored. Accordingly, this study aims to evaluate the statutory framework governing supported treatment under the Draft Act, through Ronald Dworkin's rights theory to determine whether the compulsory mental healthcare is justified in a principled rights-based legal framework. The study employs a qualitative doctrinal research methodology based on primary and secondary sources to achieve these objectives. The study argues that the Draft Act represents a significant departure from the custodial approach of the existing mental health legal framework of the country, as it introduces the principles of necessity, proportionality, therapeutic purpose, least restrictive care, procedural fairness and institutional accountability to supported treatment. The study argues that the Draft Act establishes a model of principled therapeutic paternalism, allowing the State limited authority to override individual treatment preferences for therapeutic reasons, while ensuring this authority is constrained by legal grounds, respect for individual rights, and independent review. However, the study also notes that the continued reliance on predictive clinical evaluations and the practical implementation of statutory safeguards in practice suggests that transition towards a fully rights-based approach to compulsory mental health care is not complete. The study concludes that the Draft Act reflects Ronald Dworkin's conception of principled governmental authority, and that Dworkin's rights theory offers a coherent jurisprudential framework for assessing the legitimacy of compulsory mental healthcare.

Keywords: Compulsory mental healthcare; Mental health law; Ronald Dworkin; Sri Lanka; Supported treatment

Abstract ID: 124**Algorithmic coercion and contemporary rights philosophy: the demise of
normative causality**

Chelsea Karunaratne*

*Faculty of Law, General Sir John Kotelawala Defence University (KDU), Ratmalana, 10390, Sri Lanka*Corresponding author*: chelseakithnara@gmail.com

In light of constitutional democracy, the enforcement of public law in the era of artificial intelligence (AI) is marked by a steady acceleration of algorithmic governance. Thus, leading to a pivotal question: Can the Rule of Law's traditional principles remain relevant when state decision-making is increasingly dependent on automation? This paper investigates the extent to which contemporary administrative and constitutional norms guarantee the appropriate safeguard of the human component in decision-making procedures. Subsequently, a doctrinal and normative comparative methodology between the United States of America and the European Union examines contemporary approaches to regulation, in regards to emerging international norms pertaining to AI, human rights, democracy, the Rule of Law and concepts like natural justice, reason-giving, due process and non-delegation. Analysis depicts how contemporary methods prioritize human engagement on a procedural level above substantive human judgement. Nonetheless, nominal human engagement will reduce accountability to a purely formal metric unable to offer adequate legal justification. Inherently, inductive statistical interactions run the risk of substituting deductive legal analysis. Therefore, this paper presents the argument that constitutional democracies must recognize the autonomous fundamental right to human decision-making in a manner in which is non-delegable. Such recognition would remain a constitutional prerequisite for legitimate state power, in order to prevent the 'Rule of Law' from transforming into a reckless 'Rule of Code'. Ultimately, intellectual innovation is required to adapt the law to technological realities without compromising constitutional sovereignty or the human basis of justice.

Keywords: Public law; Rule of law; Algorithmic governance; Meaningful human decision-making; Constitutional sovereignty

Abstract ID: 133

Law lagging behind AI: a feminist comparative analysis of Sri Lanka's legal response to AI nudification technologies with the European Union and Australian legal regimes

Samurdhi S. Warnakulasuriya*

*Sri Lanka Institute of Advanced Technological Education, Dehiwala, Sri Lanka*Corresponding author*: samurdhi@slate.ac.lk

Artificial intelligence (AI) has enabled nudification technologies capable of generating realistic sexually explicit images from photographs of fully clothed persons without their consent. Such applications create a form of image-based sexual abuse that raises questions of privacy, dignity, bodily autonomy, equality and effective access to remedies. This study examines whether Sri Lanka's legal framework adequately responds to AI-generated nudification through Feminist Legal Theory, while comparing relevant legal and regulatory mechanisms in the European Union (EU) and Australia. It adopts a qualitative doctrinal comparative methodology and evaluates the three frameworks against five criteria: criminalisation of relevant conduct; regulation of AI systems and developers; intermediary and platform accountability; data-protection and privacy safeguards; and victim-centred remedies, including removal mechanisms. The analysis finds that Sri Lankan law provides several potentially relevant routes, including the Online Safety Act 2024, the Computer Crimes Act 2007, general criminal law and the developing personal-data protection framework, but these mechanisms do not yet constitute a dedicated and coherent response to synthetic intimate imagery. The EU framework provides relevant preventive and transparency mechanisms through the AI Act, platform obligations under the Digital Services Act and data-protection rules under the GDPR, although these instruments should not be characterised as a standalone prohibition of AI nudification. Australia provides a particularly direct victim-remedy mechanism through the Online Safety Act 2021 and the eSafety Commissioner's image-based abuse scheme, including coverage of digitally altered and AI-generated intimate material. The study therefore argues for a Sri Lankan framework that combines targeted criminalisation with rapid removal mechanisms, platform accountability, privacy protection and preventive safeguards for high-risk synthetic-media systems.

Keywords: Artificial intelligence; AI Nudification; Image-based sexual abuse; Feminist legal theory; Comparative legal analysis

Abstract ID: 172

Sri Lanka's related rights: what works and what needs fixing: a comparative legal study?

Santhushi Abeynaike^{1*}, Neshanee De Zoysa², Yashodara Wickramanayake³

¹*School of Law, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka)*

²*Attorney-at-Law*

³*Legal associate, Invictus Law, No. 9, Glen Aber Place, Colombo 4*

Corresponding author*: santhushi.a@sliit.lk

This study examines the effectiveness of Sri Lanka's protection of related rights: performers' rights, producers' rights, and broadcasting organizations' rights under the Intellectual Property Act No. 36 of 2003. Related rights have become an indispensable part of modern Intellectual property protection, with creative industries continuing to grow both in physical and digital platforms. These rights acknowledge the work of performers, producers of sound recordings, and broadcasting organisations whose work, creativity, and technical skills make available the copyrighted works to the public. Although related rights can be found in Sri Lanka's Intellectual Property Act No. 36 of 2003, a critical analysis of statutory provisions, case law, and international standards reflect various lacunas that impact the adequacy of protection. The key issue addressed by this study is the insufficiency of the related-rights regime in Sri Lanka measured against existing international standards. While the Act provides a technologically neutral structure and basic economic rights, it still considers related rights subordinate to copyright protection, with no effective protection provided to performers, producers and broadcasting organizations. The absence of reported judicial decisions further adds to the uncertainty in interpretation and enforcement. The research adopts a qualitative doctrinal research methodology which examines primary sources: legislations, judicial decisions and international instruments and secondary sources: academic books, journals and websites. While outlining the merits of the Act, the findings bring attention to the significant gaps in the protection of performers' moral rights, digital developments, legal clarity, and collective management when compared with the European Union, and United Kingdom and other international legal standards. Accordingly, this research proposes recommendations aimed at strengthening and modernizing Sri Lanka's legal framework for protection of related rights.

Keywords: Related rights; Performer; Producer; Broadcasting organization

Abstract ID: 173

**Deepfakes as personal data under Sri Lanka's Personal Data Protection Act No. 9
of 2022**

Chaga Bihari Mahingoda*, Kushanthi Harasgama, Samurdhi Jayamaha

School of Law, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: chagabiharimahingoda@gmail.com

This paper addresses a fundamental question in data protection law: can a deepfake that resembles an individual, but was trained exclusively on other people's data, be categorised as "personal data" under Sri Lanka's Personal Data Protection Act No. 9 of 2022 (PDPA)? The conventional approach to this question focuses on the provenance of the training data: if the algorithm did not use the individual's own biometric data, can the output be said to "relate to" them? This paper argues that the answer must be yes, and that the conventional approach is both conceptually misguided and practically unworkable. Drawing on four converging theoretical frameworks, synthetic biometric data theory, the right to identity, algorithmic conscription theory, and narrative identity theory, the paper develops the concept of synthetic identity as a distinct category of data-related harm: a fabricated representation that is capable of identifying an individual, regardless of its generative provenance. The paper contends that the PDPA's definition of personal data, which focuses on whether information "can identify" a data subject, is sufficiently broad to encompass synthetic identities. The philosophical analysis demonstrates that the legal and moral focus must be on the output and its relationship to the individual, not on the data used to train the model. The paper concludes by proposing that the PDPA be interpreted purposively to recognize synthetic identities as personal data, and that legislative reform be undertaken to explicitly address the unique harms of algorithmic identity conscription.

Keywords: Deepfakes, Personal data, Synthetic identity, PDPA Sri Lanka, Biometric data, algorithmic conscription, Narrative identity

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Abstract ID: 36

Comparative effectiveness of EMLA cream and lidocaine hydrochloride spray in reducing pain during peripheral intravenous cannulation: implications for oncology and palliative care nursing practice

Dumini Hetti Arachchi *

*National Cancer Institute, Apeksha Hospital, Maharagama, Sri Lanka.*Corresponding author* - duminisulochana1986@gmail.com

Peripheral intravenous cannulation is one of the most frequently performed invasive procedures in healthcare and is commonly associated with pain, anxiety, and patient discomfort. These challenges are particularly important in oncology and palliative care, where repeated venous access is often required. Topical anesthetic agents, including Eutectic Mixture of Local Anesthetics (EMLA) cream and lidocaine hydrochloride spray, are widely used to reduce cannulation-related pain; however, their comparative effectiveness remains uncertain. A systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Electronic databases, including PubMed, MEDLINE, CINAHL, and the Cochrane Library, were searched for studies published between 2022 and 2026, with selected earlier studies included where highly relevant. Eligible studies were critically appraised using the Critical Appraisal Skills Programmed (CASP) checklist, and findings were synthesized narratively. Six high-quality studies met the inclusion criteria. Both EMLA cream and lidocaine hydrochloride spray significantly reduced pain associated with peripheral intravenous cannulation. Most studies reported greater analgesic effectiveness with EMLA cream, while lidocaine spray demonstrated the advantage of a faster onset of action, making it particularly useful in emergency and time-sensitive clinical settings. Both interventions improved patient comfort and satisfaction during cannulation. EMLA cream and lidocaine hydrochloride spray are effective topical anesthetic interventions for reducing cannulation-related pain. EMLA cream appears to provide superior pain relief in most clinical settings, whereas lidocaine spray offers practical advantages when rapid venous access is required. These findings support evidence-based nursing practice and have important implications for improving patient-centered care in oncology and palliative care settings.

Keywords: Peripheral intravenous cannulation; EMLA cream; Lidocaine hydrochloride spray; Pain management; Oncology nursing

Abstract ID: 72**Perception towards migration among nursing undergraduates in Sri Lanka: an
exploratory qualitative study**

S.S.P. Warnakulasuriya¹, D.K.M. De Silva¹, H.M.C.M. Herath¹, S.N. Chathurika^{1*}, U.G.N. Priyadarshani¹, N. Rathnayake²

¹Department of Clinical Nursing, Faculty of Nursing, University of Colombo, Nugegoda, 10250, Sri Lanka

²Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna, Galle, Sri Lanka

Corresponding author*: chathurikasepala@dcn.cmb.ac.lk

This exploratory qualitative study investigated the perceptions of Sri Lankan nursing undergraduates regarding migration after completing the Bachelor of Science in Nursing (B.Sc. Nursing) degree. Given the increasing migration of healthcare professionals, particularly nurses, the study explored student nurses' migration intentions and the factors shaping their perceptions. Data were collected through two focus group discussions with final-year nursing undergraduates from two Sri Lankan state universities. Collected data were subjected to thematic analysis through inductive approach, and thereby key themes and sub-themes were elicited. Five major themes emerged. "Migration is necessary upon completion of the B.Sc. Nursing Degree" reflected participants' aspirations to pursue postgraduate education, specialized nursing qualifications, and exposure to advanced healthcare technologies. "Migration is not expected" depicted the views of students who preferred to remain in Sri Lanka to serve the local healthcare system and community. "Migration as a major pathway to personal goals" highlighted motivations such as achieving financial stability, improving quality of life, and pursuing alternative career opportunities. "Migration is helpful for professional growth" emphasized the perceived benefits of international experience in enhancing professional competence, improving nursing standards, and strengthening the status of the nursing profession in Sri Lanka. Finally, "The ethical aspect of migration depends on its real goal" revealed that migration for education or professional development was generally considered ethical, whereas permanent migration after receiving free public education raised ethical concerns among some participants. Nursing undergraduates perceived 'migration' as a valuable opportunity for professional development and personal advancement while recognizing ethical responsibilities toward their home country. These findings provide important evidence for workforce planning and policy development to improve nurse retention and support sustainable nursing workforce strategies in Sri Lanka.

Keywords: Nursing undergraduates; Migration; perception

Abstract ID: 79**Attitudes towards family involvement in nursing care and associated factors
among nursing undergraduates at a selected university in Sri Lanka**K.T. Dilrukshi¹, K.M.W.R. Weerasooriya^{2*}, T. Abeyaratne² and T.D. Amarasekara²¹College of Nursing - Kalutara, National Institute of Health Sciences, Sri Lanka²Department of Nursing and Midwifery, Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Sri LankaCorresponding author*: kanchanaweerasooriya@sjp.ac.lk

Family involvement in nursing care is vital for enhancing patient outcomes, as families provide emotional support, assist in care planning, and act as surrogate decision-makers. Nursing undergraduates, as future professionals, play a key role in fostering family-centered care. Understanding their attitudes is essential for shaping holistic practice. A descriptive cross-sectional study was conducted among 156 nursing undergraduates at a Sri Lankan university to identify nursing undergraduates' attitudes and associated factors towards family involvement in patient. Data were collected using a self-administered questionnaire comprising sociodemographic details and the Families' Importance in Nursing Care – Nurses' Attitudes (FINC-NA) instrument. The tool assessed four dimensions: family as conversational partner, coping resource, resource in nursing care, and burden. Descriptive statistics and Pearson correlation analysis were applied. Most participants were female (79.5%), aged 23–25 years (84%), and in their fourth academic year (59%). Overall, students demonstrated positive attitudes toward family involvement, with a mean score of 100.79 (SD = 10.88); 85.9% expressed positivity. Subscale analysis showed the strongest attitudes toward family as a resource in nursing care ($m = 39.62$, $SD = 4.89$). Significant associations were observed with attitudes and gender ($p = .012$, $r = .20$); personal experience of family illness and training ($p = .019$, $r = .188$), and year of study ($p = .025$, $r = .180$). Nursing undergraduates generally hold favorable attitudes toward family involvement, particularly as a resource in care provision. Integrating family-centered care principles and structured palliative modules into curricula may strengthen preparedness to engage families as active partners in patient care.

Keywords: Attitude; Associated factors; Family involvement; Nursing undergraduates

Abstract ID: 85**A comprehensive lifestyle health assessment among Sri Lankan IT professionals**

Shanka Amarasekara*, Sugeeswari Lekamge, Anupama Perera

*Department of Computing and Information Systems, Faculty of Computing, Sabaragamuwa University of Sri Lanka, Belihuloya, 70140, Sri Lanka*Corresponding author* - shankavisal@gmail.com

In Sri Lanka, a number of lifestyle-related health issues have emerged among the employees of the IT sector, but most of the research to date has concentrated on specific behavioural factors, without using a multidimensional approach. In this study, the researchers explore lifestyle health among Sri Lankan IT professionals within six dimensions of lifestyle medicine: nutrition, physical activity, stress management, sleep quality, social connection, and risk-behaviour avoidance, and look at how these six dimensions relate to the overall psychological health of the participants, along with demographic and work-related factors. A quantitative cross-sectional survey design was used with a structured tool adapted from the validated instruments: FANTASTIC Lifestyle Checklist, the Healthy Lifestyle and Personal Control Questionnaire (HLPCQ) and the Short Multidimensional Inventory Lifestyle Evaluation (SMILE) was used to measure well-being by using the WHO-5 Well-Being Index. Stratified online sampling was used to collect data and 316 valid responses were analysed using descriptive statistics, reliability analysis, correlation, hierarchical and stepwise regression, one-way ANOVA and chi-square tests. Physical activity scored the lowest ($M = 2.73$, $SD = 0.83$) and risk-behaviour avoidance the highest ($M = 3.96$, $SD = 1.08$) scores for the domains. After hierarchical regression analysis, physical activity ($\beta = 0.53$), sleep ($\beta = 0.38$), and social connection ($\beta = 0.23$) were identified as significant positive predictors of well-being, accounting for 64.4% of the variance in well-being ($R^2 = .644$, $F = 140.81$, $p < .001$). The most dominant structural determinants of health outcomes were workload and working hours.

Keywords: Lifestyle health assessment; IT professionals; Well-being; Physical activity; Sri Lanka

Abstract ID: 120**Mapping the evidence of nurses' knowledge and attitudes on palliative care: a
narrative review**

M.K.C.P. Gunasekare^{1*}, W.U. Sanjeevani², M.A.N. Karunathilaka², R.M.M. Pabasari², T. Swarnasabaesan², D.C. Madushan³, K.G.G. Samankumari², H.M.C.M. Herath¹

¹*Department of Clinical Nursing, Faculty of Nursing, University of Colombo, Sri Jayawardenepura, Thalapathpitiya, Nugegoda, Sri Lanka*

²*Department of Nursing, Faculty of Health Sciences, The Open University of Sri Lanka, Nawala, Nugegoda, Sri Lanka*

³*Department of Nursing & Midwifery, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka*

Corresponding author*: chamodyapraneeth21@gmail.com

Palliative care is a specialized and multidisciplinary care approach for patients with life-threatening illnesses to enhance the quality of life by alleviating the pain and suffering of both the patients and family members holistically. To ensure an effective palliative care approach, the nurses should be comprehensive and positive in their attitudes. Thus, this review will serve as a concise analysis of current evidence on nurses' knowledge and attitudes towards palliative care, which is the objective of the study. A systematic literature review was executed through the search engines, including Google Scholar, Scopus, and PubMed, separately by the authors with predetermined Boolean operators and a timeframe between June 2026 and January 2020. A total of eleven studies with peer-reviewed, open access, and full articles were selected, whereas grey literature and those with irrelevant focus were excluded following a thorough screening process. The key findings were summarized and extracted in tabular form and described using a narrative and thematic analysis. According to the literature selected, the nurses mostly demonstrate a moderate or low level of knowledge, whereas they acquire favourable and positive attitudes, regardless of the context, emphasizing a considerable gap in knowledge towards palliative care. In further analysis of the previous findings, specialized education and training modalities were shown to be significant associated factors influencing the level of knowledge. Therefore, it supports the conclusion of addressing knowledge deficiencies through focused interventions, such as knowledge boosting programs, targeted clinical trainings, and appropriate nursing curriculum development, is timely and crucially important.

Keywords: Nurses; Knowledge; Attitude; Palliative care; Narrative review

Abstract ID: 134**Caregiver burden, family functioning, and dementia care: findings from a tertiary dementia clinic in Colombo**

Isuri Bandarigoda^{1*}, Vinya Kaviratne¹, Naduni Yashima¹, Anjula Gamlath¹, Kashyapa Maduranga¹, Kalpani Abhayasinghe², Lalin Fernando³

¹Department of Nursing and Midwifery, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Ratmalana, Sri Lanka.

²School of Nursing, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

³Department of Psychiatry, University Hospital, General Sir John Kotelawala Defence University, Sri Lanka.

Corresponding author*: isbandarigoda@gmail.com

Dementia is an increasing public health challenge in Sri Lanka, where family members provide most long-term care. The demands of caregiving may contribute to caregiver burden and affect family functioning; however, evidence from Sri Lanka remains limited. Aim of the study was to assess caregiver burden and family functioning among family caregivers of people with dementia attending a tertiary dementia clinic in Sri Lanka and to examine the relationship between caregiver burden and family functioning. A descriptive cross-sectional study with a qualitative integration was conducted at the dementia clinic of the University Hospital, General Sir John Kotelawala Defence University, between August and November 2025. Fifty-five primary family caregivers completed a sociodemographic questionnaire, the Zarit Burden Interview (ZBI-22), and the General Functioning subscale of the McMaster Family Assessment Device (FAD-GF-12). Semi-structured interviews were conducted with 11 caregivers. Quantitative data were analysed using descriptive and non-parametric statistics, while qualitative data were analysed using conventional content analysis. The mean caregiver burden score was 28.09 (SD = 18.37). Overall, 41.8% of caregivers reported no-to-mild burden. Unhealthy family functioning was identified in 58.2% of families. Caregiver burden was significantly associated with dementia stage ($p = .002$) and duration of caregiving ($p = .015$). Although the correlation between caregiver burden and family functioning was weak and non-significant ($r_s = .087$, $p = .528$), family functioning differed significantly across burden categories ($p = .020$). Qualitative findings highlighted emotional strain, physical exhaustion, inadequate preparedness, and limited support services as key contributors to caregiver burden. Caregiver burden increases with dementia progression and prolonged caregiving. Family-centred interventions, caregiver education, and early identification of caregiver burden are needed to support dementia care in Sri Lanka.

Keywords: Caregiver burden; Family functioning; Dementia; Family caregivers; Sri Lanka

Abstract ID: 136**Knowledge, attitudes, and preparedness of nursing students in providing
LGBTQ+ healthcare: a narrative review**D.C. Madushan^{1*}, H.M.N. Herath²¹*Department of Nursing and Midwifery, Faculty of Allied Health Science, General Sir John Kotelawala Defense University of Sri Lanka*²*Department of Nursing, Faculty of Health Science, The Open University of Sri Lanka, Sri Lanka*Corresponding author*: dhehi.charith@gmail.com

Globally, healthcare systems are increasingly prioritizing equitable healthcare for LGBTQ+ populations, who face significant health disparities and discrimination. Nurses are essential in delivering patient-centered care and promoting health equity; nevertheless, many nursing students exhibit inadequate knowledge and clinical experience related to LGBTQ+ health issues. This deficiency can negatively impact their confidence and preparedness. Consequently, understanding nursing students' knowledge and attitudes is critical for formulating effective educational strategies and inclusive curricula, as examined in this narrative review. Aim is to synthesize current evidence on nursing students' knowledge, attitudes, and preparedness in providing LGBTQ+ healthcare. Articles published between January 2020 and March 2026 that included nursing students were selected. The literature search was conducted following SANRA guidelines and using databases including PubMed, Scopus, and Google Scholar with keywords such as "LGBTQ healthcare," "nursing students," "knowledge, attitudes, preparedness," and "cultural competence." Only peer-reviewed original research was included. Systematic and narrative reviews were considered only to provide contextual background but were not included as primary evidence. Results were presented in tables highlighting the author and year, title of the study, study design, and key findings of each study. This narrative review examined studies from 2020 to 2026 regarding nursing students' knowledge and preparedness to care for LGBTQ+ patients. The results showed that most students did not know much about LGBTQ+ health issues, especially when it came to health risks and culturally sensitive care. Most people had positive attitudes, but there were still some negative views and stigma. Many students reported feeling unprepared, citing insufficient educational background or clinical practice. The review emphasized the importance of including LGBTQ+ topics in nursing curricula and discussed how self-efficacy and previous interactions can help improve skills. Nursing students have good feelings about LGBTQ+ people, but they do not know much about them. To be competent, they need extensive education and training.

Keywords: LGBTQ healthcare; Nursing students; Knowledge; Attitudes; Preparedness; Cultural competence

Abstract ID: 152**Impact of menstruation on daily activities and work performance among female
factory workers in Western province, Sri Lanka**

Sendini Gunathilake ^{1*}, Isuri Jinendrasinghe ¹, Nisma Halaldeem ¹, Jennifer Ashton ¹, Chathuri Samarasinghe ²,
Muditha Muthucumarana¹

¹*School of Nursing, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*

²*Department of Mathematics and Statistics, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*

Corresponding author*: sendinigunathilake@gmail.com

Menstruation is a normal physiological process that often affects women's daily functioning and work performance. Female factory workers may be particularly vulnerable due to physically demanding work, long hours, fixed break schedules, and limited access to appropriate menstrual facilities. Evidence concerning this impact in Sri Lanka remains limited. This study aims to address whether and to what extent menstruation affects the daily activities and work performance of female factory workers in selected factories in Western Province, Sri Lanka. A quantitative cross-sectional study was conducted among female factory workers aged 18–50 years in three selected private manufacturing factories in Western Province. A total of 212 participants were recruited using convenience sampling. Data were collected via a printed, structured questionnaire assessing the impact of menstruation on daily activities and work performance. Work performance impact was assessed using Likert-scale and multiple-choice items, with responses combined to derive an overall menstrual impact score. Data were analysed using descriptive statistics. Among the 212 participants, 52% reported that they never avoided work due to menstrual symptoms. When experiencing menstrual symptoms at work, 44% reported using painkillers, 15% continued working through the pain, 27% took short breaks, and 14% attempted to obtain sick leave. However, only 35% reported that menstruation never affected their productivity. Most participants also reported no discrimination or embarrassment at work related to menstruation, while the majority indicated that menstruation had never affected their overall quality of life. Although menstruation had some impact on daily activities and work performance, most female factory workers maintained relatively stable productivity and attendance during menstruation. However, the tendency to continue working despite menstrual discomfort and reliance on painkillers or short breaks suggest that hidden burdens persist. These findings emphasize the importance of implementing supportive workplace measures, including adequate menstrual facilities, opportunities for rest, and flexible workplace policies, to reduce the impact of menstruation on daily activities and work performance among female factory workers.

Keywords: Menstruation; Menstrual health; Female factory workers; Work performance; Workplace well-being

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Abstract ID: 08**Sex and stigma in Sri Lankan society: a Foucauldian discourse analysis**

Samudika Rathnayaka*

*Faculty of Management, University of Ruhuna, Wellamadama, 81000, Sri Lanka*Corresponding author*: samudikarathnayaka2018@gmail.com

Educational textbooks serve as teaching tools and as cultural texts that shape and spread ideology. Drawing on Michel Foucault's concepts of discourse, power, and knowledge, this study investigates how the representation of sexuality in the Sri Lankan Grade Eight Health and Physical Education textbook (government syllabus) reflects and reinforces dominant ideological discourses. The book targets thirteen-year-old students. It investigates how the textbook creates knowledge about sexuality, which types of knowledge are favoured or overlooked, and how these presentations mirror larger power dynamics in Sri Lankan society. Using Foucauldian discourse analysis and comparative textual analysis, the research examines the prescribed textbook along with the supplementary publication *Hathe Ape Potha*, which stirred public debate for its approach to sexuality education. The analysis shows that the textbook mainly describes sexuality in terms of biological reproduction, social norms, and moral rules. It provides little information on adolescent changes, menstruation, masturbation, sexual health, and consent. These gaps act as strategies that support dominant cultural and religious views on sexuality. Additionally, the debate around *Hathe Ape Potha* highlights how alternative views on sexuality face pushback when they challenge established norms. The study suggests that the textbook is a place where power and knowledge come together, creating specific truths about sexuality while leaving out others. By exploring the ideological aspects of educational discourse, this paper adds to the conversation about power, ideology, and representation in cultural texts and emphasizes how educational media can both support and challenge prevailing social values.

Keywords: Sexuality education; Educational media; Cultural texts; Educational textbooks; Power and discourse

Abstract ID: 31**Automatic construction of a graph-based Sinhala WordNet using rule-based semantic relation extractions**Pivindi Nimanga^{1*}, Miditha Tissera²¹*Faculty of Computing and Technology, University of Kelaniya, Kelaniya, Sri Lanka*²*Department of Software Engineering, Faculty of Computing and Technology, University of Kelaniya, Kelaniya, Sri Lanka*Corresponding author*: pivindinimanga@gmail.com

Lexical semantic resources such as WordNet play a crucial role in Natural Language Processing (NLP) by providing structured representations of semantic relationships between words. However, the development of such resources for processing Sinhala texts stagnates due to the scarcity of language-specific lexical databases and annotated corpora. In working out a solution to the issue, this study endeavours to present a graph-based Sinhala WordNet constructed through rule-based semantic relation extraction from unstructured Sinhala texts. The proposed approach utilizes handcrafted linguistic patterns and regular expression-based rules to automatically identify semantic relations such as synonymy, hypernymy-hyponymy, and meronymy-holonymy. To demonstrate its efficiency, a collection of such extracted lexical concepts and their semantic connections are represented in a Neo4j graph database, enabling efficient storage, querying, and traversal of lexical knowledge. Based on the reviewed literature, this work introduces a graph-based automatically generated Sinhala lexical network using rule-based semantic relation extractions from unstructured texts. The system was evaluated using a manually reviewed dataset comprising 700 Sinhala sentences, and the quality of the extracted relations was assessed through human annotation. The Percent Agreement and Fleiss' Kappa statistics that emerged from the assessment indicates substantial agreement among annotators, demonstrating the reliability of the extracted semantic relations. The resulting lexical network provides a scalable foundation for developing Sinhala lexical resources and has potential applications in information retrieval, machine translation, question answering, semantic search, and other Sinhala NLP tasks.

Keywords: Regular expressions; Low-resource language; Sinhala WordNet; Knowledge graph

Abstract ID: 40**The free-rider problem in ESL group work: Sri Lankan students' accounts of uneven participation**Rashmi Muniprema^{1*}, Dinushika Jayathissa^{2*}¹*Independent Researcher, 6B/50, Rosemary Garden, Muduuwa, Ratnapura, Sri Lanka*²*Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*Corresponding author*¹: rashmi.academix@gmail.comCorresponding author*²: dinushika.j@sliit.lk

Cooperative learning (CL) is often promoted in English as a Second Language (ESL) classrooms for its ability to generate positive interdependence and create a culture of individual accountability for learners. Yet the circumstances in which such principles can be undermined remain poorly understood from a classroom-relevant perspective. Particularly, it focused on unravelling how ESL students interpret uneven participation in cooperative work. This study investigated the emergent themes associated with Ordinary Level (OL) ESL students' experiences with uneven participation during pair and group activities at an international school in Nugegoda, Sri Lanka. Using a phenomenological qualitative inquiry guided by Interpretative Phenomenological Analysis (IPA) methodology, fifteen semi-structured individual interviews were held with a purposefully chosen sample of participants aged 15–17. Informed verbal consents were provided by the study participants, their parents and the school administration before conducting interviews and analyses. Interview responses were audio-recorded, transcribed verbatim, and underwent descriptive phenomenological analyses. The analysis was guided by IPA to explicate learners' lived experiences with group collaborative tasks. Findings demonstrated that the phenomenon of uneven participation was a common occurrence during classroom-based group work. Several students described having done beyond their share of work because peers have been less motivated. Some others reported experiencing group members who were quite hesitant about completing shared tasks and relied on others to deliver. Students associated free riding with negative outcomes arising from group allocation procedures initiated by the teacher and described instances when less capable peers had not been supported adequately and had less opportunity to share their ideas. Overall, this study found that positive interdependence and individual accountability were not inherent to the CL approach in this research context. In fact, group activities need to be more carefully structured by the teacher in order to avoid free-riding problems and ensure productive group dynamics.

Keywords: Cooperative learning; Free-rider effect; Individual accountability; ESL classroom; Sri Lanka

Abstract ID: 53

**The mimic man as national allegory: Piyal and the postcolonial transition in martin
Wickramasinghe's *Gamperaliya***

Tharuni Bandara, Chamidi Perera*

Faculty of Humanities and Education, CINEC Campus, Malabe, 10115, Sri Lanka

Corresponding author*: chamidicharvi@gmail.com

Martin Wickramasinghe's *Gamperaliya*, rendered into English as *Uprooted*, narrates the disintegration of a feudal and agrarian order in colonial Ceylon and the rise of a commercial class that displaces it. This study examines Piyal, the village English tutor who ascends from social marginality to mastery over the property and prestige of the landed Kaisaruwatte family, as the central symbol of postcolonial transition in the novel. The research pursues three aims: to analyse how English operates as colonial capital in Piyal's ascent and in the markers of his colonial mimicry; to interpret his commercial rise, set against the decline of the landed Kaisaruwatte family, as the formation of a national bourgeoisie; and to assess how far the novel invites and resists the reduction of Piyal to a national allegory. The study adopts a qualitative method of close textual reading, conducted on the English translation, and frames its analysis through the concept of colonial mimicry, the critique of the national bourgeoisie, and the long debate over whether third-world texts function as national allegories. The analysis finds that Piyal operates as a national allegory, since his trajectory maps the structural transformation of colonial society, yet his psychological particularity, marked by insecurity, ambition, and ambivalence, resists a totalising reduction. The novel therefore both invites and resists allegorical reading. The significance of the study lies in bringing a canonical Sinhala novel into direct dialogue with postcolonial theory, and in using the text to test, rather than merely to illustrate, the claim that the personal narrative of the colonised subject must always figure the nation

Keywords: Colonial mimicry; Martin Wickramasinghe; National allegory; Postcolonialism; Sinhala novel

Abstract ID: 54**Perceptions of Sri Lankan English Among Science, Technology, Engineering and
Mathematics Academics in Sri Lankan Universities**

Lakshi Nanayakkara*

*First-Year Division, Faculty of Computing, Sri Lanka Institute of Information Technology, Malabe,
10115, Sri Lanka*Corresponding author*: lakshi.n@sliit.lk

Research on Sri Lankan English (SLE) has described its features and examined how English teachers and students perceive it. However, little is known about how academics in science, technology, engineering and mathematics (STEM) perceive SLE, although they teach through English and use it daily for research and professional communication. This qualitative study examined how STEM academics perceive SLE and how they position themselves and SLE in relation to their disciplinary practices, teaching, and expectations of students' English. Semi-structured interviews were conducted with 12 STEM academics from one state and one private university in Sri Lanka. Data was analyzed using thematic analysis, with positioning theory as the interpretive lens. Three themes were developed. First, participants recognized features of a local English, such as accent and vocabulary, but most did not accept it as a legitimate variety and ranked it below British and American English. Second, participants used English as a marker of social class, changed their accent and vocabulary depending on the audience, and described their own competence as dependent on who was listening. Third, participants claimed that ideas matter more than the variety of English but relied on Sinhala to support understanding. Three participants also treated AI-generated English as the most accurate model for students. This tentative finding suggests that AI tools may be taking the place once given to the native speaker as the source of correct English. The study recommends raising awareness of World Englishes within STEM disciplines and a critical approach to AI-assisted language refinement.

Keywords: Sri Lankan English; STEM academics; Language attitudes; Positioning theory; Generative AI

Abstract ID: 59**A study on the approaches adopted in the translation of culturally specific items in novels**Jamaldeen Fathima Rifka^{1*}, Singanayagam Umashankar²¹*Department of Languages, Faculty of Arts and Culture, Eastern University, 30350, Sri Lanka*²*Department of English Language Teaching, Faculty of Arts and Culture, Eastern University, 30350, Sri Lanka*Corresponding author*: rifkaijlas@gmail.com

Translation has always been deemed a communication medium among different cultures and languages. Hence, the investigation of translations across history can reflect the translational approaches and strategies in a specific era. The translation of culturally specific items in novels presents a complex challenge as these elements are closely interconnected to the cultural, social and historical contexts of the source language. The study on the approaches adopted in the translation of culturally specific items in novels investigated the strategies adopted by translators in rendering the culturally specific items in translated novels using comparative descriptive analysis and examined how cultural meanings were conveyed to the target readers before and after the second half of 20th century. Based on the major translation theories proposed by scholars Eugene A. Nida, Newmark and Venuti, the research focused on identifying the strategies used to translate culturally specific items related to ecology, material culture, social culture, organization, customs, activities, procedures, and concepts. A comparative analysis method was employed and analysed selected source texts and their translations to understand the effectiveness of translation strategies handled in translating culturally specific terms. The study explored strategies, transliteration, functional equivalent, descriptive equivalent, synonymy, through-translation, shifts and neutralizing. The analysis revealed that translators rarely rely on a single strategy. The findings indicated that translators have adopted various strategies in both specific periods. This study emphasized the role of translator as a cultural mediator and highlighted the importance of culturally informed strategies in literary translation.

Keywords: Culture specific items; Source text oriented; Target text oriented; Strategy; Literary translation

Abstract ID: 60**An investigative study on lower secondary teachers' awareness on neurolinguistic teaching techniques in the English as a second language classroom**

Tharindu Jayamanna*

*Independent Researcher, 574/5, 1st lane, Suriyamal Mawatha, Thalagama North, Battaramulla, Sri Lanka*Corresponding author*: tharindu.jayamanna12@gmail.com

The study investigated the awareness of neurolinguistic teaching (NLT) techniques among lower secondary English as a Second Language (ESL) teachers in Sri Lanka, the factors influencing their awareness, and their perceptions of the applicability of NLT in classroom practice. A qualitative descriptive research design was adopted, guided by the Neurolinguistic Programming (NLP) theoretical framework. Data were collected through semi-structured interviews with 20 purposively selected lower secondary ESL teachers from five national schools following the Sinhala-medium national curriculum. The interview data was analysed using thematic analysis involving transcription, coding, categorisation, and theme development. The findings revealed varying levels of awareness, with 40% of participants demonstrating moderate awareness, while 30% exhibited high awareness and 30% showed low awareness. Although most teachers recognised learner-centred instruction, authentic communication, and rapport building as important teaching practices, many lacked a comprehensive understanding of the theoretical foundations of NLT and often confused it with general communicative language teaching. Professional development programmes, teacher education, and teaching experience emerged as the primary factors enhancing awareness, whereas limited institutional support, inadequate training, examination-oriented curricula, and time constraints hindered effective implementation. Participants generally perceived NLT as beneficial for improving learner confidence, communicative competence, and classroom interaction despite practical challenges such as large class sizes and limited resources. The study concludes that strengthening pre-service and in-service teacher education through targeted professional development on neurolinguistic teaching principles can enhance teachers' competencies and facilitate the effective integration of learner-centred, evidence-based practices in the Sri Lankan ESL context.

Keywords: Neurolinguistics, Neurolinguistic teaching techniques (NLT), ESL classroom, awareness

Abstract ID: 66**Enhanced hate speech detection in social media: a comparative study of machine and deep learning models with optimized biLSTM and custom word embeddings**Kithmini Pabasara Gunawardana^{1*}, Nipuni Duminda²¹*Faculty of Computing, Sri Lanka Institute of Information Technology, Malabe, 10115, Sri Lanka*²*Department of Computer System Engineering, Faculty of Computing and Technology, University of Kelaniya, Kelaniya, Sri Lanka*Corresponding author*: Kithmipabasara@gmail.com

This study is based on improving an existing hate speech detection model to detect hateful messages in sensitive domains like military news and political discussions on social media platforms. Hate speech is not only a computational classification problem but also a linguistic and sociocultural phenomenon expressed through lexical choices, contextual meanings, discourse strategies, pragmatic cues, and social identities. Consequently, effective hate speech detection requires computational methods capable of identifying complex language patterns while supporting the analysis of harmful online communication. The primary objective of this study is to improve the F1-score, which provides a more balanced evaluation of precision and recall than accuracy alone, particularly for imbalanced datasets. The study employs a dataset of more than 29,000 sentences labelled as hate speech, offensive language, or neither, sourced from Twitter and annotated by multiple CrowdFlower contributors. Various feature extraction techniques, including Bag of Words, TF-IDF, and Word2Vec, were evaluated using classical machine learning models such as SVM, Logistic Regression, Random Forest, Naive Bayes, KNN, Decision Tree, and Passive Aggressive Classifier, together with deep learning architectures including RNN, CNN, LSTM, BiLSTM, and BERT. Over-sampling and under-sampling techniques were applied to address class imbalance. Experimental results showed that the Bidirectional Long Short-Term Memory (BiLSTM) model with a custom-trained Word2Vec embedding achieved the best performance, attaining an accuracy of 95% and a macro-averaged F1-score of 0.96 across the three classes. Beyond performance improvement, the findings demonstrate how Natural Language Processing techniques can support the identification and interpretation of linguistic patterns associated with hate speech, thereby bridging language-focused research and artificial intelligence approaches. Future work will explore attention mechanisms and Explainable AI (XAI) techniques to enhance transparency, adaptability, and practical applicability.

Keywords: Hate speech detection; BiLSTM; Word2Vec; Deep learning; Natural language processing

Abstract ID: 93**Teacher readiness and professional development for integrating digital literacy into
English language teaching (ELT) in Sri Lankan government schools**

Toshika Wijesinghe*

*English Language Teaching Unit, Faculty of Built Environment and Spatial Sciences, General Sir
John Kotelawala Defence University, Southern Campus, Sooriyawewa, Sri Lanka*Corresponding author*: wijesinghetg@kdu.ac.lk

This study explores teacher readiness and professional development for integrating digital literacy into English Language Teaching (ELT) in Sri Lankan government schools. Effective incorporation of digital literacy into ELT is essential to equip students with evolving technical skills, especially in the present context where digital technologies are transforming education. However, challenges such as limited ICT infrastructure and differences in teacher competencies often hinder progress in such, especially in resource-constrained settings like Sri Lanka's public education system. The research employed a qualitative approach, involving semi-structured interviews and focus group discussions with a purposive sample of 100 English teachers from government schools in the Southern Province. Data were analyzed using thematic analysis to identify recurring patterns and themes. Key findings revealed moderate to low levels of teacher readiness, with participants demonstrating basic familiarity with digital tools and limited confidence in pedagogically integrating digital literacy into ELT lessons. Major barriers revealed included inadequate access to reliable internet and devices in schools, insufficient training in digital pedagogies, time constraints, and concerns over students' varying digital access and English proficiency levels. Teachers expressed strong needs for targeted professional development, including hands-on workshops on digital resource curation, blended teaching strategies, and addressing ethical issues in online ELT environments. The study highlights the urgency of context-specific, sustained professional development programs to bridge these gaps, enhance teacher self-efficacy, and promote equitable digital integration in Sri Lankan ELT. Recommendations include policy support for infrastructure upgrades and collaborative training initiatives to foster digitally competent English educators.

Keywords: Digital literacy; Teacher readiness; Professional development; English language teaching (ELT); Government schools

Abstract ID: 94**Exploring the role of morphological awareness in enhancing vocabulary
acquisition among ESL learners in Sri Lanka**H.W.N.P. Hakadewaththe^{1*}, S.T.A. Wickramasinghe^{1, 2}¹*Department of English Language Teaching, University of Kelaniya, Kelaniya, Sri Lanka*²*Department of Interdisciplinary Studies, University of Sri Jayewardenepura, Nugegoda, Sri Lanka*Corresponding author*: nipunih@kln.ac.lk

English plays a significant role in global communication across education, technology, commerce, and politics. Vocabulary acquisition is a fundamental aspect of second language (L2) learning as it influences learners' comprehension and overall communicative competence. Although morphological awareness is considered an effective strategy for vocabulary development, limited research has examined its impact among Sri Lankan ESL undergraduates. This mixed-methods study investigated the effect of morphological awareness instruction on vocabulary acquisition among first-year undergraduates at the Faculty of Humanities, University of Kelaniya, while exploring challenges in vocabulary learning. Twenty students were selected through stratified random sampling. The intervention consisted of eight instructional sessions focusing on word formation processes, including prefixes, suffixes, roots, and compounding. Quantitative data from pre-tests and post-tests were analyzed using descriptive statistics and paired-samples t-tests in SPSS, while qualitative data were collected through focus group discussions and teacher observations. The findings showed a significant improvement in vocabulary performance after the intervention. Students' mean scores increased from 22.45 (SD = 10.86) in the pre-test to 34.00 (SD = 9.43) in the post-test. The paired-samples t-test confirmed a statistically significant difference ($t(19) = 12.94, p < .001$), with a mean gain of 11.55 marks. Qualitative findings revealed challenges related to limited vocabulary exposure, difficulties in understanding word formation, contextual vocabulary use, and confidence in academic writing. The study concludes that explicit morphological awareness instruction is an effective approach for enhancing vocabulary acquisition and supporting academic language development among Sri Lankan ESL learners.

Keywords: Challenges, Effectiveness, Morphological awareness, Second language learning, Vocabulary acquisition

Abstract ID: 96**Enhancing grammar learning through direct instruction and interactive games in an
ESL classroom**

Basheer Fathima Merfath*

*Department of English Language Teaching, Southeastern University of Sri Lanka, University Park,
Oluvil, 32360, Sri Lanka*Corresponding author*: fathimamerfath@gmail.com

Prepositions are key elements of English grammar and are often a problem for English as a Second Language (ESL) learners in the accuracy and confidence of their use. This classroom action research study compared the relative effectiveness of direct instruction and interactive games in improving the use of prepositions among second language learners in Grade 8 in a Sri Lankan secondary school. The topic was chosen from the students' syllabus and competency level to explore the two instructional approaches in a familiar learning area. This study involved 29 students, who took part in two phases of instruction: grammar direct instruction and an interactive game phase, which employed the method of Prepositional Charades. Data were gathered using post-tests, classroom observations, and a short questionnaire on learner engagement and instructional preferences. The findings indicated that students' scores in the interactive game phase ($M = 32.14$) were higher than in the direct instruction phase ($M = 15.55$). Informal observations also suggested higher engagement and confidence in the use of language during game-based tasks, especially for the less competent learners. Additionally, 26 out of 29 students preferred the interactive game approach. The outcome indicated that direct instruction is an effective grammatical basis, while interactive games provide a more interesting and conducive atmosphere for practicing and using prepositions. The study reveals the importance of integrating explicit teaching with interactive and student-centred approaches to teaching ESL grammar.

Keywords: Direct instruction; Interactive games; Prepositions; Classroom action research; ESL learners

Abstract ID: 109

**Exploring cultural challenges in simultaneous parliamentary interpreting: evidence
from the parliament of Sri Lanka**

K.H.D.I. Kariyawasam*, W.M. Ariyaratne

Department of Languages, Faculty of Social Sciences and Languages, Sabaragamuwa University of Sri Lanka, Belihuloya, 70140, Sri Lanka

Corresponding author*: dulminiimalsha@gmail.com

Interpretation, the oral translation of spoken or signed language, plays a vital role in bridging linguistic barriers in multilingual contexts. In Sri Lanka, Sinhala, Tamil, and English are used in parliamentary proceedings, creating a complex multilingual environment. In this setting, simultaneous interpreters are required not only to convey linguistic meaning but also to handle culturally embedded expressions in political discourse. This study aims to explore the cultural challenges faced by simultaneous parliamentary interpreters in Sri Lanka. Primary data were collected through in-depth interviews with eleven interpreters working with Sinhala–English–Sinhala and Sinhala–Tamil–Sinhala language pairs. In addition, selected parliamentary debates were analysed to identify culturally specific expressions and contextual references. The data were analysed using content analysis, drawing on the concepts of cultural mediation and Skopos Theory. Cultural mediation highlights the interpreter's role in transferring culturally embedded meanings, while Skopos Theory emphasises the importance of purpose in shaping interpreting strategies. Findings reveal that interpreters face significant challenges when dealing with idiomatic expressions, political metaphors, and context-bound references, further intensified by the fast-paced nature of simultaneous interpreting. This study highlights the cultural complexities of parliamentary interpreting in Sri Lanka.

Keywords: Translation studies; Interpretation; Cultural mediation; Political discourse; Simultaneous interpreting; Parliamentary interpreters

Abstract ID: 114**Examining the impact of e-learning on distance learning among university
undergraduates: with special reference to the Open University of Sri Lanka**

K.H.D.I Kariyawasam*, Rohan Abeywickrama

*Department of Languages, Faculty of Social Sciences and Languages, Sabaragamuwa University of Sri Lanka, Belihuloya, 70140, Sri Lanka*Corresponding author*: dulminiimalsha@gmail.com

This study examines the impact of E-Learning on distance learning in Sri Lanka, along with an emphasis on students' perceptions and experiences of a government university. A quantitative research methodology was used, with data collected from 100 first-year university undergraduates through an online questionnaire, followed by secondary data obtained from academic sources. The research includes an objective approach to identify key factors affecting the effectiveness of E-Learning in distance education. The results showcase that those students generally hold a favourable perception of technology-enabled learning. Especially, Learning Management Systems (LMS) and various other online tools are largely used and considered beneficial for enhancing students' understanding, collaboration and communication. Moreover, the accessibility and flexibility of online learning platforms enable students to manage their studies with greater independence and efficiency. Nevertheless, the study also identifies several challenges, including inadequate internet connectivity, limited access to technological devices, and disparities in access to digital resources among students. These issues emphasise the present digital divide within the Higher education sector. As a whole, this study underscores the significance of enhancing technological infrastructure and digital literacy. Addressing these challenges is of paramount importance for encouraging a more effective and sustainable approach to distance learning in Sri Lanka.

Keywords: Distance learning; Management systems; Student perceptions; Technology integration; Learning

Abstract ID: 115

**Strategies used by teachers to reduce English language speaking anxiety in ESL
classrooms: a case study of a state school**

Rathnayaka Rasanjalee*

Department of English and Linguistics, University of Ruhuna, Matara, 81000, Sri Lanka

Corresponding author*: rdrasanjalee@gmail.com

This study investigates the strategies used by ESL (English as a second language) teachers to reduce students' speaking anxiety in ESL classrooms. Despite years of learning the English language, students still struggle to speak fluently. English language speaking anxiety limits students' participation and affects their oral development. The study involved two ESL teachers with more than five years of teaching experience at R/EMB/ Omalpe Vidyalaya. A qualitative research design was employed. Data were collected through semi-structured interviews, which were audio-recorded. Both participants reflected on strategies they use to reduce speaking anxiety in their classrooms. The data were analysed using thematic analysis. The analysis involved identifying, coding, and grouping recurring patterns under themes. The findings demonstrate that teachers identified language speaking anxiety as a factor that needs greater attention. The key strategies were organised into four main themes such as creating a low- anxiety learning environment, teacher support and motivational feedback, interactive and collaborative learning practices and task adaptation for learner ability. The study concludes that teachers play a central role in helping learners overcome speaking anxiety. Furthermore, the combination of emotional support, interaction, and appropriate task design is essential for reducing English speaking anxiety. The objective was to explore the strategies used by ESL teachers to overcome learners' speaking anxiety. This study is significant because it provides practical insights for ESL teachers on how to overcome students' language anxiety. The findings can help ESL teachers create more confident English speakers in ESL classrooms.

Keywords: Collaborative learning; ESL learners; Feedback strategies; Speaking anxiety; Teacher strategies

Abstract ID: 121

**ESL teachers' challenges in the e-learning process for primary grades: a case study
from a Sri Lankan national school**

Tharindu Sarathchandra^{1*}, Sewmini Chandrasekara²

^{1*}*Postgraduate Institute of English, The Open University, Nawala, 10250, Sri Lanka*

²*Faculty of Education, University of Colombo 03, 00300, Sri Lanka*

Corresponding author*: smtdarshana1994@gmail.com

Medical school personal statements represent a critical component of the admissions process, yet the increasing volume of unstructured textual data presents significant challenges for selection committees seeking to extract meaningful information efficiently. This study used a multi-faceted approach involving language detection, text preprocessing, sentiment analysis, emotion detection, named entity recognition, Latent Dirichlet Allocation (LDA) and Non-Negative Matrix Factorization (NMF) topic modelling, keyword extraction, text summarization, knowledge graph creation, word embedding with Word2Vec, principal component analysis (PCA), collocation analysis, and k-means clustering of 150 anonymized personal statements. Five main thematic areas emerged from the results: relevant background (personal narrative), strengths and skills, motivation for entering medicine, healthcare related content, and clinical interests/special pathways. Three rule-based methods (TextBlob, VADER, SentiWordNet) were compared through sentiment analysis, analyzed with machine learning classifiers (Naive Bayes, Support Vector Machines), and validated with 100% accuracy for the VADER approach. Notably, the analysis showed that the majority of personal statements were objective as opposed to subjective. The study offers a validated methodological approach for automated text analysis of medical school applications, with potential implications for admissions efficiency, applicant guidance, and reduction of evaluation bias. Future research should link computational text analysis outcomes to longitudinal admissions data to validate predictive validity and cross-institutional generalizability.

Keywords: Natural language processing; Sentiment analysis; Topic modelling; Medical education; Personal statements

Abstract ID: 127**Rewriting gender narratives in counter discourses: a multimodal discourse analysis
of contemporary Sri Lankan advertising**

Kalani Dissanayake*

*Department of English, Faculty of Humanities and Education, CINEC Campus, Malabe, Sri Lanka*Corresponding author*: kalaniharshani55@gmail.com

This study examines how contemporary Sri Lankan advertisements function as counter discourses that reconstruct gender narratives through multimodal communication. Advertising is a powerful tool in shaping identities, transferring values and constructing or reconstructing ideologies. Traditionally, advertisements have reinforced existing gender stereotypes by representing women as passive dependents mainly responsible for domestic work, and men as decision making, economically dominant and authoritative gender. However, contemporary Sri Lankan advertisements significantly challenge these stereotypical gender representations by rewriting the gender narratives with alternative possibilities, which largely contributes to ideological transformation. The study aims to explore how such advertisements function as counter discourses challenging gender ideologies. For this purpose, the study adopts a qualitative approach employing Multimodal Critical Discourse Analysis drawn upon Fairclough's (1995) three-dimensional framework of textual analysis, discursive practice and social practice along with Kress and van Leeuwen's (2006) framework for visual grammar. Eight contemporary Sri Lankan television and digital advertisements were selected through purposive sampling and were analysed accordingly. The findings reveal a significant transformation from traditional gender ideologies toward redefined female identities and the representation of masculine identities through care, emotional engagement and shared household responsibilities. Visual and linguistic elements enhance the impact by contributing to reconstructing gender identities. Further, the analysis indicates that some advertisements subtly reinforce conventional expectations within redefined contexts, suggesting that both progressive and traditional ideologies coexist in contemporary Sri Lankan advertising discourse. The study concludes that contemporary Sri Lankan advertising discourse rewrites gender narratives, making a huge ideological reconstruction and at the same time, reflecting evolving gender relations in society.

Keywords: Sri Lankan advertising; Gender narratives; Counter-discourse; Discourse analysis; Visual discourse

Abstract ID: 139

The semiotics of silence: a study of the role of silence as a medium of emotional expression in Chimamanda Ngozi Adichie's "a private experience" and "the American embassy"

Pawani Tharushika*

Department of English, University of Kelaniya, Dalugama, Kelaniya 11600, Sri Lanka

Corresponding author*: tharu.gwp@gmail.com

This study examines the semiotics of silence in Chimamanda Ngozi Adichie's short stories "A Private Experience" and "The American Embassy," exploring how silence functions as a narrative device that conveys the emotional experience of the female protagonists in the two texts. The analysis draws on Gayatri Spivak's "Can the Subaltern Speak?" Cathy Caruth's trauma theory, and Judith Butler's concept of gender performativity as a combined theoretical framework. Based on close textual analysis and situated within recent scholarship on silence in postcolonial fiction, this study argues that in Adichie's work silence is not the opposite of speech but an active medium: a medium through which individuals articulate repression, alienation, and resistance. In "A Private Experience," silence functions as a tool of solidarity between two women experiencing shared repression under patriarchal and sectarian conditions, despite their different ethnic and religious backgrounds. In "The American Embassy," silence underscores the emotional defence and trauma of a woman confronting an oppressive political system, functioning as a possible form of resistance. In connecting these readings to a wider body of scholarship on silence, trauma, and narrative voice, this study contributes to conversations on how language and cultural context shape the exercise of human agency and autonomy. It further explores the redefinition of silence in contemporary postcolonial literature as a form of trauma response and resistance.

Keywords: Semiotics of silence; Chimamanda Ngozi Adichie; Postcolonial literature; narrative device; Trauma; resistance; autonomy

Abstract ID: 157**Exploring the role of code-mixing in enhancing the effectiveness of gastronomy
tourism promotional brochures in Sri Lanka**

Anjali Caldera*

*Department of English and Academic Literacy, Faculty of Management and Technology, BMS
Campus, Colombo 6, 00600, Sri Lanka*Corresponding author*: anjali.c@bms.ac.lk

Gastronomy tourism (GT) brochures in Sri Lanka use Sinhala and Tamil code-mixed (CM) food terms to highlight the authenticity of local cuisine. However, it remains uncertain whether international tourists understand these terms and whether their English explanations accurately represent the original dishes. This study examined the effectiveness of CM food terms through questionnaires and interviews with 50 respondents from Karusan Travels (KT) and the Professional Cookery Course at the Sri Lanka Institute of Tourism and Hotel Management (SLITHM). Findings revealed that 84% of respondents considered CM effective, noting that it highlights the uniqueness of Sri Lankan cuisine and stimulates tourists' curiosity to try local food. Regarding the accuracy of the explanations of CM terms, the majority – 18 respondents – agreed and strongly agreed with the explanation accuracy while 14 remained neutral. Some participants also indicated that excessive use of CM terms without adequate explanation could reduce reader engagement. Based on these findings, the study concludes that code mixing is an effective promotional strategy when supported by clear and concise English explanations. It recommends a data-driven multilingual content strategy that combines CM food terms with culturally accurate descriptions, high-quality images, QR codes linking to videos and recipes, and other interactive digital content. Collaboration among linguists, culinary experts, tourism professionals, and digital content developers is also recommended to improve linguistic accuracy, cultural authenticity, and visitor engagement, thereby strengthening Sri Lanka's gastronomy tourism promotion and supporting informed hospitality management decisions.

Keywords: Code mixing; Gastronomy tourism; Effective; Explanations; Digital content

Abstract ID: 158

**Analyzing gender representation in the junior secondary ESL textbooks in the Sri
Lankan national curriculum**

Sewmini Gunasena*

*Department of English and Academic Literacy, Faculty of Management and Technology, BMS Campus,
Colombo 6, 00600, Sri Lanka*

Corresponding author*: sewmini.g@bms.ac.lk

Textbooks are essential in classroom learning, especially in ESL settings, as they not only facilitate the development of language but also communicate social beliefs and values. Consequently, how learners and communities are depicted in textbooks can greatly impact their sense of identity and belonging. However, research shows that educational materials often reflect dominant social groups, with underrepresented groups marginalised or shown in limited ways. This study examines gender representation in Sri Lankan junior secondary ESL textbooks (Grades 6 to 9), focusing on the distribution and active participation of male and female characters in both textual and visual content. Using a mixed qualitative-quantitative content analysis, the four prescribed pupils' books were analysed to identify dominant patterns of gender representation. The quantitative component mapped the frequency and visibility of male, female, and unidentifiable characters, while the qualitative component identified recurring thematic patterns in the textual and visual content. The findings revealed a male-dominant pattern of representation across all four textbooks, with males consistently outnumbering females in both characters and active roles. The qualitative analysis further revealed the reproduction of traditional and stereotypical gender roles, with females largely confined to domestic and caregiving roles while males were portrayed across a wider range of occupations and achievements. These findings suggest that Sri Lankan junior secondary ESL textbooks reinforce limited gender inclusivity, with implications for textbook design and curriculum development.

Keywords: Gender representation; ESL textbooks; Junior secondary; Sri Lanka; Content analysis

Abstract ID: 159**Songs as a pedagogical tool in enhancing ESL learners' speaking skills:
experimental study**

Umayangi Ekanayake*

*Department of English and Academic Literacy, Faculty of Management and Technology, BMS Campus,
Colombo 00600, Sri Lanka*Corresponding author*: umayangi.e@bms.ac.lk

Music and speech share similar features that naturally exist in the human mind. The General English syllabus introduced at the Advanced Level in Sri Lanka aimed to develop speaking proficiency with the textbook to develop communicative competency. Studies indicate that oral proficiency among the Advanced Level students remains alarmingly low, especially in the Arts stream. Less attention has been provided in systematic use of songs to develop English speaking performance among Arts students. Most studies have not specifically evaluated speaking-test results with Arts students' and opinions based on song-based speaking activities. This study uniquely focuses on Arts students with difficulty in oral communication. This further investigates the effect of using songs as a pedagogical tool on the development of English language speaking skills and the students' opinions on that. Accordingly, 80 (Grade 12-Arts) students were selected as the sample. The participants were divided into experimental and control groups. A pre-test was given to both groups, followed by a post-test after the treatment. Meanwhile, an opinion questionnaire containing a five-item Likert scale was distributed. The test results showed that there was a significant difference between the experimental and control groups' pre-test and post-test results. Additionally, the findings of the questionnaire revealed that a higher percentage of students preferred songs as a pedagogical tool for speaking activities. Therefore, it is recommended to include more song-related speaking activities in the syllabus to develop English speaking skills and to use songs as a pedagogical tool in delivering speaking lessons in Language classrooms in Sri Lanka.

Keywords: Communicative competency; ESL classroom; Oral proficiency; Songs as pedagogical tool; Speaking skills

Abstract ID: 160**The perceived effectiveness of murder-mystery-based gamification in teaching
academic language to diploma-level working professionals**

Minu Perera*

*Department of English and Academic Literacy, Faculty of Management and Technology, BMS Campus,
Colombo 6, 00600, Sri Lanka*Corresponding author*: minu@bms.ac.lk

Academic language remains a critical yet difficult competency for diploma-level working professionals, and lecture-based instruction is often poorly aligned with adult-learning principles, tending toward repetitive and decontextualised delivery. This qualitative study examines how working professionals perceived a three-hour murder-mystery workshop designed to teach seven core academic language principles. Twenty-eight diploma-level working professionals at a private institute in Colombo, Sri Lanka were purposively sampled and completed an open-ended questionnaire following team-based investigative roles involving flawed manuscript extracts. Data were analysed using Braun and Clarke's (2022) reflexive thematic analysis interpreted through andragogy, Self-Determination Theory and Flow Theory. Four themes emerged: narrative as cognitive scaffold, collaborative meaning making, embodied diagnosis of writing errors and confidence as professional identity at work. Participants reported that the storyline anchored abstract conventions, particularly hedging and objective language, that team disagreements produced productive discussion and that investigative roles shifted learning from passive rule reception to active error detection. Academic language was subsequently reframed as a marker of workplace credibility rather than solely an academic requirement. These findings suggest that participants perceived murder-mystery gamification as supporting metalinguistic awareness, motivation and professional relevance of academic language by aligning narrative immersion with challenge, autonomy and relatedness, offering a provisional design direction for short-format academic language workshops with adult learners

Keywords: Academic language; Andragogy; Gamification; Murder mystery

Abstract ID: 161

From guided collaboration to self-direction: a narrative inquiry into facilitator-mediated co-learning and the development of learner autonomy in the ESL classroom

Binuri Dissanayake^{1*}, Lishanthi Wijewardene²

^{1*}*Department of English Language Teaching, Faculty of Humanities and Social Sciences, University of Sri Jayewardenepura, Gangodawila, Nugegoda, 10250, Sri Lanka*

²*Business Communication Unit, Faculty of Management Studies and Commerce, University of Sri Jayewardenepura, Gangodawila, Nugegoda, 10250, Sri Lanka*

Corresponding author*: binuriyoshika@sjp.ac.lk

Over the years of English as a Second Language (ESL) classrooms, co-learning is widely valued mainly for its collaborative benefits whereas the specific role that facilitators play in transforming peer collaboration into learner autonomy remains underexplored. This study examined how ESL undergraduates provide narratives on their lecturer's role in facilitating co-learning activities and their impact on the transition towards self-directed English learning. Utilizing a qualitative narrative inquiry design, semi-structured interviews were conducted with three undergraduate ESL students, chosen to voluntarily provide in-depth exploration of individual learning. Data were analysed thematically, concerning both developmental patterns within each narrative of the participants. Findings revealed that facilitators functioned as scaffold-then-release guides, offering structured support before leaving them without direct instruction in order to establish independent thought. It further brought the emergence of peer interaction as the primary engine of learning where participants described growing confidence, independence, and self-directed habits that also yield to technology-mediated contexts beyond classroom. However, they also identified tensions including grouping challenges and unequal participation which highlighted the continued facilitator attention. These findings promote facilitator-mediated co-learning as a transitional mechanism linking guided collaboration to independent learning, offering pedagogical insights despite the sample size. The study contributes largely on how classroom-based collaborative practices can be deliberately designed to build learner autonomy. Further, it lays the foundation for future research on co-learning paradigms in different ESL environments.

Keywords: Co-learning; ESL classroom; Facilitator-mediated instructions; Learner autonomy; Narrative Inquiry

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Abstract ID: 10**The impact of socio-economic background on children's academic development
with special reference to a secondary school in Colombo, Sri Lanka**L.U. Colombage^{1*}, K.R.W. K.H. Abeywickrama²¹*Department of Surveying and Geodesy, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka*²*Department of Languages, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka*Corresponding author*: lakshani.upeksha99@gmail.com

This study investigates how socio-economic status affects academic development among secondary-level students in a Colombo secondary school, Sri Lanka, within the context of the country's post 2022 economic crisis. The study mainly focuses on five independent variables: parental education level, parental occupation, parental income, family size, and parental motivation, and examines the nature of the relationships between these factors and children's academic development. A mixed-methods approach was used to collect data. Quantitative data were gathered through a structured questionnaire, and forty students, ten secondary-level teachers, and the principal of the school were selected as the population using a simple random sampling method. Five parents of those children were purposively selected to collect qualitative data via interviews. The findings revealed that parental motivation had the strongest positive relationship with children's academic development ($r = .920$, $p < .01$), followed by parental occupation ($r = .857$, $p < .01$) and family size ($r = .771$, $p < .01$). Parental education level also showed a moderate positive correlation ($r = .545$, $p < .01$), while parental income demonstrated the weakest but still significant positive relationship ($r = .468$, $p < .01$). The results confirm what prior research has suggested: socio-economic capital shapes academic achievement. But they also add something new, which is the evidence from a post-crisis Sri Lankan setting that when material resources are limited, non-material support, particularly parental motivation, seems to carry more weight than expected. The findings indicate the importance of parental encouragement, educational support, and family environment in enhancing children's academic success. Additionally, the study has implications for parents, teachers, principals, school management, and policymakers to work collaboratively to create a supportive educational environment for students, thereby promoting their academic achievement and eliminating current academic disparities.

Keywords: Children's academic development; Secondary level students; Post-crisis; Socio-economic background

Abstract ID: 11**Perceptions of school leadership effectiveness and learning environments: a case of urban and rural schools in Sri Lanka**H.K.P. Dineshika^{1*}, Rohan Abeywickrama²¹*Department of Computing and Information Systems, Faculty of Computing, Sabaragamuwa University of Sri Lanka*²*Department of Languages, Faculty of Social Sciences, Sabaragamuwa University of Sri Lanka*Corresponding author*: dineshika.hkp@foc.sab.ac.lk

There is a growing awareness among stakeholders of the differences in education quality and achievement between urban and rural schools in Sri Lanka. As such, the present study examines the influence of principals' and teachers' leadership and management characteristics on student achievement in urban and rural schools in Sri Lanka. In particular, this investigation explores how leadership qualities can create a conducive learning environment at schools and thereby improve student performance. The pragmatic approach was used to understand the problem under discussion, employing both quantitative and qualitative research techniques. Quantitative data were gathered through questionnaires administered to eighty teachers and seventy-five students, as well as the Multifactor Leadership Questionnaire (MLQ). Qualitative data were collected through semi-structured interviews with five principals and three vice-principals. The research sample included teachers, students, and school officials from selected urban and rural schools in Sri Lanka. The findings of the study indicate a positive impact of leadership practices on students' academic success, teachers' motivation, and the overall school atmosphere. More specifically, the use of transformational and participatory leadership styles can be very helpful for creating a collaborative environment in schools. However, certain aspects, such as resource inequality, the absence of training opportunities, and various contexts associated with urban and rural settings, may negatively affect the educational process. Thus, it is recommended that skills and capabilities in leadership and management should be enhanced to improve students' achievements. The study has implications for school management, teachers, and professional development providers

Keywords: Educational leadership; School management; Transformational leadership; Learning environments; Sri Lanka

Abstract ID: 13

Can ai powered adaptive English language platforms prepare graduates of Sri Lankan universities for classroom -defined employability standards?

Asha Jayakody*

Faculty of Business, Informatics Institute of Technology (IIT Campus), Colombo 06, Sri Lanka

Corresponding author*: ashajayakody511@gmail.com

The SLASSCOM- Deloitte Employability Skills Report (2024) was conducted across 37 leading IT companies and it has awarded a mean score of 3.3 out of 5.0 for communication skills of Sri Lankan undergraduates which is a lowest value when compared to other evaluated institutions. Therefore, this study investigates the possibility of AI – powered adaptive English language platforms have the capability to measure and improve the English language communication skills demanded by SLASSCOM’S industry-defined employability framework. The research employs a Mixed method approach with a quasi – experimental research design and utilises a sample of 150 final year undergraduates from a State and a Private university enrolled in Business and Computing degree programs. Participants in the Experimental group employed ELSA Speak Business for 2 hours per week for oral and presentation skills and used the Grammarly for 1 hour per week for professional writing tasks while the Controlled group engaged in traditional mode of learning. In addition to these two primary platforms, the intervention also incorporated Duolingo Business, Claude AI and custom Large Language Models (LLM)- based tasks built on Open AI as supplementary tools. ANCOVA results demonstrated statistically important and manifested a drastic improvement in the post-test for the Experimental group (Overall composite: $F(1,147) = 92.7, p < 0.001, \eta^2 = 0.387$). The proportion of Experimental participants achieving the SLASSCOM B2 competency benchmark doubled from 21% to 46%, compared to marginal achievements in the Control group (21% to 22%). Qualitative data highlighted the immediacy and specificity of the phoneme level feedback in ELSA Speak and the genre awareness provided by Grammarly Premium in writing as key pedagogical findings. This study contributes to establish quasi - experimental evidence on the effectiveness of AI platforms for improving competencies in English language communication in the Sri Lankan higher education.

Keywords: AI, English language teaching, ELSA speak, Grammarly, Proficiency, SLASSCOM

Abstract ID: 23**A study on teaching and learning methods and techniques in teaching geography**

Manimel Dura Prabuddhi*, Virajith Gamage

*Faculty of Graduate Studies, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*Corresponding author*: ME24076470@sliit.lk

Education in the twenty-first century is no longer limited to the transmission of knowledge but is viewed as a holistic process that promotes students' intellectual, social, emotional, and technological development in response to global change. As a multicultural and globalized nation, Sri Lanka has recognized the importance of Geography education and has continuously revised the school Geography curriculum. However, despite these reforms, evidence from students' academic performance suggests that the intended learning outcomes have not been fully achieved. This study examined current Geography teaching and learning methods, techniques, and students' perceptions in Sri Lanka. The main objective was to investigate teaching and learning methods used in Grades 10 and 11 Geography classes in Sinhala-medium schools in the Ambalangoda Education Zone of Galle District. A stratified random sampling method was used to select 40 schools. Data were collected through questionnaires, semi-structured interviews, focus group discussions, and classroom observations. A mixed-methods approach was adopted, combining qualitative and quantitative methods. Data were analysed using descriptive and inferential statistics. A pilot study was conducted to ensure validity and reliability. Findings revealed that lecture and lecture-discussion methods were the most frequently used instructional approaches, while active and experience-based learning methods were used less frequently. Resource and systemic constraints hindered the implementation of learner-centred and innovative teaching strategies. The study emphasizes the need to improve Geography teaching methods and promote learner-centred practices to enhance learning outcomes.

Keywords: Geography education; Teaching-learning process; Teaching and learning methods and techniques; Students' perceptions

Abstract ID: 32**An action research on enhancing the formation of English alphabet letters in a grade 7 ESL student**

Pasangie Mahaarachchi*, Kingsly Priyantha

*Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*Corresponding author*: pasangie92@gmail.com

Legible handwriting is a fundamental skill that supports effective written communication and academic achievement, particularly in English as a Second Language (ESL) classrooms. However, incorrect letter formation can negatively affect the readability of students' written work and their overall learning outcomes. This action research investigates how targeted instructional interventions can improve the formation of English letters of a Grade 7 ESL student with illegible handwriting. The study focuses on one Grade 7 student identified through classroom observations, interviews with teachers, document analysis, and data triangulation. The research adopts a qualitative action research design using the cyclical process of planning, implementing, observing, and reflecting. The intervention includes teacher demonstrations, visual observation of correct letter formation, and guided multisensory practice using alphabet charts, flashcards, air writing, sandpaper letters, stencils, and hand-painting activities. Data was collected through classroom observations, students' written work, reflective journals, interviews, and document analysis to evaluate changes in letter formation. The study expected to improve the student's accuracy in forming English letters, enhance handwriting legibility, and increase confidence in writing tasks. The findings were anticipated to provide practical insights for ESL teachers on implementing simple, classroom-based interventions to address handwriting difficulties and contribute to improving students' written communication skills in secondary school contexts.

Keywords: Handwriting; Letter formation; English as a second language (ESL); Action research; Secondary school student

Abstract ID: 34**Towards a Moodle course blended teaching index (MCBTI): a conceptual framework for evaluating online blended course design in Moodle LMS**

Iroshini Ratnapala*

*Computer Centre, Faculty of Engineering, University of Peradeniya, Peradeniya, Sri Lanka*Corresponding author*: iroshinir@eng.pdn.ac.lk

Blended teaching combines planned online teaching with learning management systems (LMSs) that support content, activities, communication, assessment, feedback, and face-to-face learning. Although learning analytics has extensively examined learner behaviour, it has paid less attention to systematically analysing teacher-designed LMS features as evidence of blended course design. This paper proposes the Moodle Course Blended Teaching Index (MCBTI), a preliminary framework for describing observable Moodle-based design features. It synthesises the Community of Inquiry (CoI) framework, Constructive Alignment, blended-learning literature, and Keller's ARCS motivational design model. Eight dimensions were deductively operationalised through Moodle indicators: Scaffolding (SCI), Content Diversity (CDI), Content Volume (CVI), Assessment (ASI), Social Presence (SPI), Motivation Content (MCI), Constructive Alignment (CAI), and Academic Presence (API). A preliminary demonstration used five randomly selected Moodle courses from five departments at a Sri Lankan university. Indicator values were normalised using the minimum and maximum observed values in this sample and then aggregated with equal weighting. The demonstration shows how MCBTI can describe variation in Moodle course design but does not validate the framework, establish an effectiveness threshold, or demonstrate pedagogical effectiveness. MCBTI is therefore presented as a research and quality-improvement framework requiring expert review, multi-course validation, and study of its relationship with face-to-face teaching and learner outcomes.

Keywords: Blended teaching; Learning management system; Moodle; LMS; Pedagogy

Abstract ID: 65**Transforming teacher preparation: an empirical study of ai adoption, perceptions,
and integration by pre-service teachers in Sri Lanka**

Nuwan Dissanayake*

*Pulathisipura National College of Education, Polonnaruwa, Sri Lanka*Corresponding author*: mrnuwandissanayake@gmail.com

Generative artificial intelligence (AI) is rapidly reshaping how future teachers learn and prepare to teach, yet empirical evidence on pre-service teachers in South Asian teacher education institutions remains scarce. This study asked how prospective teachers at a state National College of Education in Sri Lanka use AI, which factors predict their continued use, and what levels of AI literacy and pedagogical integration they report. A bilingual (Sinhala–English) cross-sectional survey framed by the extended Unified Theory of Acceptance and Use of Technology (UTAUT2) was completed by 94 pre-service teachers of Primary and Agricultural Education. Adoption was near universal: 96.8% had used ChatGPT and 94.7% Google Gemini, and 61.7% reported daily use, overwhelmingly on smartphones (90.4%). Academic use ($M = 3.42$) significantly exceeded teaching–learning preparation use ($M = 2.82$), $t(93) = 6.82$, $p < .001$, $d = 0.70$, and teaching-related use was significantly lower among interns than second-year students. UTAUT2 constructs explained 70.5% of the variance in behavioural intention, with effort expectancy ($\beta = .46$) and habit ($\beta = .45$) the only significant predictors. AI literacy was modest ($M = 3.08$); only 14.9% could explain how generative AI works and 36.2% perceived clear institutional guidance. The findings reveal a use–understanding gap and an academic–pedagogical transfer gap in teacher preparation. Teacher educators should embed explicit AI literacy instruction, practicum-based modelling of AI-integrated pedagogy, and co-constructed institutional policy to convert habitual personal use into principled professional practice.

Keywords: Artificial intelligence; pre-service teachers; Technology acceptance; AI literacy; Teacher education

Abstract ID: 74**Factors Influencing the Effective Use of Tablets in Teaching: A Mixed-Methods Study of 1AB Schools within the Akmeemana Educational Division, Galle**Dilini Chathurika Gunasekara Kankanamge*, *Lakmal Eranda Kumara**Faculty of Graduate Studies, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*Corresponding author*: ME24075794@my.sliit.lk

Sri Lanka's 2017 national tablet distribution policy aimed to provide free tablet computers to Advanced Level students and teachers to modernize public education, later expanding to grades 6–11 to bridge the digital divide. However, the classroom efficacy of distributing 97,000 devices remains unclear. Grounded in the Technology Acceptance Model (TAM) and Technological Pedagogical Content Knowledge (TPACK) framework, this study assesses tablet utilization levels and identifies factors influencing integration in 1AB government schools within the Akmeemana Educational Division, Galle. An explanatory sequential mixed-methods design was employed, combining a quantitative survey of 214 teachers, semi-structured interviews with six purposively selected key informants, and qualitative open-ended survey responses. Results: Tablet utilization is low and limited to basic tasks rather than transformative pedagogical practices. Although teachers demonstrated high technology acceptance and ICT competency, these individual factors were weak predictors of actual usage. Statistical analysis identified institutional support as the most significant predictor of tablet utilization. Qualitative data reinforced these results, identifying inadequate infrastructure, specifically poor connectivity and device scarcity as the dominant barrier, followed by time constraints and limited subject-specific training. A critical readiness-implementation gap exists, demonstrating that high teacher readiness is insufficient without robust systemic support. Realizing digital transformation requires shifting focus from individual readiness toward comprehensive institutional support.

Keywords: Educational technology; Institutional support; Tablet utilization; Technological pedagogical Content knowledge (TPACK); Technology acceptance model (TAM)

Abstract ID: 76

Enhancing L2 writing accuracy and fluency through structured group work: a case study of grade 9 ESL learners in a Sri Lankan government school

D.D.H.G.Y. Senarathne, Harsha Dulari Wijesekera*

¹ *School of Education, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*

Corresponding author*: senarathneyash@gmail.com

This study examines how structured group writing tasks affect the accuracy and fluency of Grade 9 ESL students' writing in a Type 1C Sri Lankan government school. Drawing on second language (SLA) theories, and the Complexity, Accuracy and Fluency (CAF) framework, the research addresses three gaps: a limited empirical focus on role-based collaborative writing in Sri Lankan secondary schools, the absence of tandem accuracy-fluency assessment within the CAF framework, and the unexamined role of translanguaging as a spontaneous scaffolding resource in such tasks. Using an explanatory sequential mixed-methods design, the study engaged 40 learners over eight weeks; participants were placed in heterogeneous groups of five, each assuming a distinct functional role: Idea Generator, Scribe, Resource Manager, and Editor across four writing stages: prewriting, drafting, peer evaluation, and revision. Quantitative analysis using a paired-samples t-test and Cohen's d showed significant improvements in accuracy and fluency across all rubric dimensions ($p < .001$; $d = 1.672-2.062$). Qualitative thematic analysis of group interaction recordings, classroom observations, a survey, and a focus group discussion identified four explanatory mechanisms: peer error detection, collaborative lexical negotiation, structured pre-writing as an organisational scaffold, and positive learner perceptions of motivation and responsibility. Translanguaging occurred in all eight groups, with the Resource Manager enabling Sinhala-to-English drafting that resolved lexical gaps and supported semantic precision. 87.5% of learners preferred group writing and 85% reported increased confidence. Findings offer evidence-based pedagogical guidance for ESL teachers managing large, resource-constrained classrooms in the Sri Lankan secondary education context.

Keywords: Structured group writing; L2 writing accuracy; L2 writing fluency; Translanguaging; CAF framework

Abstract ID: 77

Spatial misalignment in teacher placement: distribution patterns in difficult and very difficult schools in the Dehiowita educational zone, Sabaragamuwa province.

Ridma Madavi Abeywickrama Dissanayake*, Lakmal Eranda Kumara

¹Faculty of Graduate Studies, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: me24076920@my.sliit.lk / ridmamadavivithanage@gmail.com

Mapping is one of the core data-representing tool for identify the spatial distribution of the root level. Teacher utilization in the local context, which is currently, needed to digitalize for institutional decision-making proposed. Therefore, this Study was conducted as spatial misalignment distribution Pattern of teachers' placement at difficult & very difficult Schools in the Dehiowita Educational Zone, Sabaragamuwa Province. Objectives of study- Identifying the distribution pattern between teachers' placements in difficult and very difficult schools relative to the teachers' permanent residence according to the education division spatially & statistically. The methodology was designed as a quantitative method design. Quantitative data collected from proportional stratified Random sampling method was use for selecting 36 schools by 241 teachers, analysed by SPSS & ArcGIS 10.8.1. Initially; Spatial Analysis creates direction, distribution and density maps of teachers' placement & teachers' residents using GIS. A Descriptive statistical method was used to summarize the characteristics of the data. Using by descriptive Statistics according to study objectives & hypotheses. The primary conclusion of this research is a misaligned distribution pattern of teachers' placement in difficult and very difficult schools in the Dehiowita Education Zone of Sabaragamuwa Province, proven by MANOVA results yielded a significance value of $p < 0.01$ based on Pillai's Trace, including a statistically significant multivariate effect. Consequently, the H1 is accepted. Teachers' Mobility areas were clustered around the Sabaragamuwa Province boundaries consist of Kurunegala, Gampaha, Colombo, Kalutara, NuwaraEliya, Kegalle, Ratnapura & Galle. Ampara can be identified as a special district & teacher mobility clusters are highly concentrated in Kegalle district. This research recommends that a policy framework should be developed to understand and address the spatial inequalities in teachers' quality in difficult & very difficult Schools in remote areas addressing SDG 4.0 quality education in Sri Lanka.

Keywords: Difficult and very difficult schools, Teacher placement, Teacher permanent residence, Education division, Regional misalignment Distribution pattern

Abstract ID: 81

Contrafacta as a vocabulary learning approach for ESL learners: a theoretical and empirical review

Iruka Tharani De Silva^{1*}, Harsha Dulari Wijesekara²

¹*Faculty of Graduate Studies Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*

²*School of Education, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*

Corresponding author*: me24083850@my.sliit.lk

Vocabulary acquisition remains a persistent challenge for English as a Second Language (ESL) learners in Sri Lanka, where conventional instruction predominantly promotes passive, receptive knowledge through rote memorisation and translation methods. This paper presents the theoretical foundations and pedagogical design of a quasi-experimental study investigating Contrafacta; a music-based instructional technique in which target vocabulary is embedded within the melody of a familiar song as an alternative vocabulary teaching strategy for Grade 6 ESL learners at a semi-urban government school in Sri Lanka. Drawing on Paivio's (1986) Dual Coding Theory, Craik and Lockhart's (1972) Levels of Processing framework, Krashen's (1982) Affective Filter Hypothesis, Vygotsky's (1978) Zone of Proximal Development, and Gardner's (1983) Theory of Multiple Intelligences, the study argues that Contrafacta offers a cognitively grounded, affectively supportive, and socially mediated alternative to conventional vocabulary instruction. A quasi-experimental, mixed-methods crossover design was employed, involving 30 learners identified through baseline performance analysis. Vocabulary tests, peer classroom observations, and student reflective notes were used as data collection instruments. The study is positioned to address a significant gap in contextualised research on music-based vocabulary instruction in under-resourced South Asian ESL settings, and its design is grounded in both theoretical rigour and practical accessibility for government school teachers.

Keywords: Contrafacta; Vocabulary acquisition; ESL learners; ESL teaching strategies; Music-based instruction; Sri Lanka; ELT

Abstract ID: 89

Between learning and teaching: a mixed-method case study of secondary students' English language learning strategies and teachers' pedagogical accommodation in a Sri Lankan type 1ab government school

A.K.S. Jayarathna*, Harsha Dulari Wijesekera

School of Education, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, Sri Lanka

Corresponding author*: hs22160584@my.sliit.lk

Language Learning Strategies (LLS) play an important role in second language acquisition; however, little is known about how these strategies are recognised and accommodated by teachers in Sri Lankan secondary school classrooms. This mixed-method case study investigated (1) the Language Learning Strategies employed by students of two secondary grades, (2) how English language teachers recognise and accommodate these strategies, and (3) the factors that facilitate or constrain such accommodation in a Type 1AB government school in the Kalutara District, Sri Lanka. Quantitative data were collected from 80 students using the Strategy Inventory for Language Learning (SILL), while qualitative data were collected through semi-structured interviews with four English teachers and focus group discussions involving eleven students. Quantitative data were analysed using descriptive statistics, whereas qualitative data were analysed using thematic analysis. Students displayed a medium frequency of strategy use, where cognitive and metacognitive strategies were found to be predominant among the participants. Although teachers employed learner-centred practices to accommodate students' learning needs, explicit Strategy-Based Instruction was largely absent. Systematic barriers such as exam-oriented teaching, larger class sizes, scarcity of resources and lack of professional development on Language Learning Strategies affected teachers' capacity to implement strategy-based instruction. In addition, the results have highlighted the growing impact of digital media on the students' independent English language learning. The study provides context-specific evidence on the relationship between students' Language Learning Strategies, teacher accommodation practices, and contextual influences affecting English language learning within this Type 1AB government school context. Given the single-site case-study design and limited sample, the findings are context-specific and are not intended to be generalized to Sri Lankan secondary education as a whole.

Keywords: Language learning strategies (LLS); Strategy inventory for language learning; Teacher accommodation; Strategy-based instruction; Sri Lankan secondary education

Abstract ID: 91

**Task-based language teaching (TBLT) in writing: an intervention study with
grade 8 ESL students in type 1ab school in Sri Lanka**

W.M.K.C. Wanasooriya*, Harsha Dulari Wijesekara

School of Education, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka)

Corresponding author*: kalaniwanasooriya03@gmail.com

Writing is considered as one of the most challenging skills in second language acquisition because it requires learners to integrate different abilities such as grammatical accuracy, vocabulary knowledge, idea organization, coherence, and creativity simultaneously. In the Sri Lankan ESL class setting, many learners face significant problems when it comes to writing because of the teacher-dominated instructional approach, examination-focused learning environment, and lack of communicative opportunities. For this reason, a study was conducted to examine the effectiveness of TBLT in improving the writing abilities of Grade 8 ESL learners in a particular Type 1AB school in the Kegalle district. The study adopted a mixed-method case study design by combining both quantitative and qualitative approaches. Quantitative data were collected through pre-tests and post-tests to examine changes in students' writing performance before and after the intervention. Qualitative data were gathered through classroom observations and students' reflective notes to explore students' perceptions and experiences regarding task-based writing activities. The intervention lasted for a total period of ten weeks during which task-based learning approach through collaborative writing tasks, brainstorming, group discussions, role-playing, problem solving, and writing tasks were utilized. It was observed that initially the students had issues regarding their problems with grammar, vocabulary use, idea organization, mechanics, reliance on memorized answers, and lack of confidence while writing. But after comparing the pre-test and post-test outcomes, it became clear that there was marked improvement in the writing abilities of the students. Moreover, the qualitative results found that learners gained more motivation, confidence, ownership of writing, classroom participation, and motivation for English writing in task-based learning. The study thus concluded that TBLT can serve as an efficient learner-centered teaching approach to enhance Grade 8 ESL writing in the context of the Sri Lankan classroom.

Keywords: Task-based language teaching (TBLT), ESL writing, Writing performance, Grade 8 students, Mixed-methods, Sri Lanka.

Abstract ID: 95**Investigation of subtle UI micro-interactions and their influence on user emotion**

Nipuni Marasingha*, Kumudu Kaushalya

*Department of Computing and Information Systems, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka*Corresponding author*: mannimarasingha@std.appsc.sab.ac.lk

One of the biggest problems in modern UX design is that numerous digital products are effective in terms of functionality, but not necessarily in terms of engaging the user emotionally. Examples of subtle UI micro-interactions that can be found in mobile and web apps include notifications, haptic feedback, animation, and sound cues, which can shape user experience and reactions to digital interfaces. But few studies directly examine how emotion-user experience relationship can be studied directly in the context of the study of UI micro-interactions in the daily use of digital environments. This research examined how the UI micro-interactions affect users' emotional states in digital interactions. Emotional reactions to selected UI micro-interactions were hover effects, progress indicators, toggle switch, reaction animation, checkbox, notification pop-up messages were assessed using a structured Likert-scale questionnaire. Emotionally these were explored for comfort, satisfaction, enjoyability, engagement, confidence and clarity. The data were collected from 300 active mobile and web users, and analysed descriptively, reliability, correlation, regression and ANOVA. The findings showed that there were positive correlation between UI micro interactions and overall user emotion. Confidence was found to be an important emotion predictor of core user emotion, indicating that users need to feel confident and in control when interacting. The results show that UI micro-interactions are not just functional but also can help foster emotional user experiences. This study contributes to affective UX research by providing evidence-based UX design guidelines that help designers create more engaging, user-centred, and emotionally resonant digital interfaces.

Keywords: Emotion; Human computer interaction; Micro-interactions; User experience; UX design

Abstract ID: 98

**Stakeholders as identity mirrors: how student, parent, and peer responses shape
EMI teacher competence perception**

Shameema Rasheed^{1*}, Harsha Dulari Wijesekera^{1, 2}

¹*Faculty of Graduate Studies, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*

²*School of Education, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*

Corresponding author*: myhomeshamy@yahoo.com

Teaching is never a private act. What a teacher believes about their own competence is shaped, affirmed, and sometimes quietly damaged by those who surround them - students, parents, and professional peers. This paper introduces the concept of identity mirrors - the notion that these stakeholder responses reflect back images of competence or inadequacy that teachers internalize into their professional self-perceptions. It examines how this dynamic operated among English Medium Instruction (EMI) Information and Communication Technology (ICT) teachers in Sri Lankan secondary schools, drawing on narrative inquiry and life-story interviews with three participants. The findings reveal a striking pattern: these teachers succeeded not because the system supported them, but because they learned - sometimes painfully - to interpret, resist, and draw strength from the mirrors that surrounded them. The paper argues that stakeholder recognition is not background to EMI teacher identity. It is constitutive of it. The presentation closes with implications for teacher education, calling for programmes that prepare EMI teachers not only linguistically but relationally - for the social ecology they will actually inhabit.

Keywords: Identity mirrors; EMI teacher identity; Stakeholder recognition; Narrative inquiry

Abstract ID: 100**Ux design strategies to reduce cognitive load in ai-powered applications: a study
of Sri Lankan state university students**

Lakruwan Kavinda, Kumudu Kaushalya*

*Department of Computing and Information Systems, Sabaragamuwa University of Sri Lanka*Corresponding author*: lakruwankavinda689@gmail.com

Artificial intelligence (AI) has become a part of everyday digital applications and is used to predict, recommend, create content, and make choices. The user interface (UI) of AI systems is essential for building user trust and understanding, and poorly designed interfaces can overload information and create high cognitive load for users such as university students. This study explores how user experience (UX) design principles can be applied to minimize cognitive load and ensure the right level of transparency in the graphical user interface (GUI) of AI based applications. A quantitative survey based approach was adopted to collect data from 300 students at public universities in Sri Lanka. Each participant evaluated three widely used AI platforms ChatGPT, Google Gemini, and Microsoft Copilot using a structured questionnaire that included a modified five dimension NASA-Task Load Index (NASA-TLX) and a nine item UX Strategy Scale. The findings show that composite cognitive load scores did not differ significantly across the three platforms. Interface support and clarity of explanations showed significant negative associations with cognitive load and were the only significant predictors in the regression model. Step-by-step guidance and system transparency did not reach statistical significance as predictors. The study therefore supports the practical value of clear interface support and explanation clarity, while noting that claims about step-by step guidance and a transparency load paradox remain exploratory. Concise UX design guidelines are suggested for creating cognitively accessible AI interfaces for non expert users.

Keywords: Cognitive load, UX design, AI applications, NASA-TLX, Human-AI interaction

Abstract ID: 103

Reforming the electronic technology component of Sri Lanka's G.C.E. (advanced level) engineering technology curriculum: an evidence-based review of student and teacher perspectives

Gayathri Kanakaratne*

Ministry of Education, Isurupaya, Battaramulla, Sri Lanka

Corresponding author*: gkkanakaratne@gmail.com

In order to adapt secondary education to the evolving skill requirements of the labour market, Sri Lanka added the Technology stream to the General Certificate of Education, Advanced Level (G.C.E. A/L) curriculum in 2013. Even though electronics is the foundation of nearly every modern engineering career, practitioners generally believe that the Electronic Technology component of the Engineering Technology course yields lower student achievement than the other three constituent areas: Civil, Mechanical, and Electrical Technology. Instead of treating every conceivable reform level as settled, this paper presents the results of a mixed-methods curriculum study conducted across three purposively selected schools, twenty-five Engineering Technology teachers, fifty Grade 13 students, and five members of the G.C.E. A/L marking panel. This paper distinguishes between claims that have widespread expert support, such as that inadequate practical time and unequal teacher subject-matter preparation lower achievement, and claims that are still genuinely debatable, such as how much instructional guidance practical work should carry, whether physical components or virtual simulations better teach circuit concepts, and whether early vocational specialization eventually helps or hurts students' long-term labour-market adaptability. These conclusions are compared to performance data from Sri Lanka's Department of Examinations, current informal feedback from a member of the marking panel, and the country's phased general education reform schedule for 2026–2031. The recommendations for curriculum, teacher development, and resources in the paper's conclusion are qualified by the underlying research's disputes rather than being blind to them.

Keywords: Engineering technology; Electronic technology; Curriculum; STEM education

Abstract ID: 118**Grade 10, 11 science syllabus teacher's guide analysis**Harshanie Rodrigo*, *Lakmal Eranda Kumara**Faculty of Graduate Studies, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*Corresponding author*: harshanie.c.rodrigo@gmail.com

In the context of globalization, developing human resources capable of accelerating economic growth through innovation is a fundamental necessity for developing nations like Sri Lanka. Education plays a pivotal role in this regard, with science education standing at the forefront. Research literature indicates that science teachers encounter numerous challenges when implementing science education within the system. Analyzing science education syllabi can help identify solutions to these challenges; consequently, an analysis of the content of the teacher's guides for the Grade 10 and 11 science syllabi was conducted. The study was conducted using a qualitative research methodology. Data were collected through a content analysis of the teacher's guides for the Grade 10 and 11 science syllabi and subsequently analyzed using thematic analysis. The analysis revealed that the curriculum philosophy for the Grade 10 and 11 science syllabi is student-centered and competency-based; however, it also identified several issues: a limited number of competency levels covering the K, A, and S domains in the Grade 11 syllabus; minimal use of the most effective student-centered science education methods employed globally; a low number of learning outcomes directly addressed through assessment and evaluation; gaps between learning outcomes and content; instances of a lack of alignment with the textbook; and a scarcity of practical experiments in the biology component. Accordingly, it can be concluded that the science syllabus for Grades 10 and 11 is a student-centered and competency-based curriculum; however, there is limited achievement of attitudinal competencies within the Grade 11 Science syllabus, infrequent use of effective, innovative student-centered methods, and a low number of practical experiments in Biology.

Keywords: Science; Syllabus; Student-centered; Evaluation and assessment; Competencies

Abstract ID: 122**Exploring the role of rubric-based peer feedback in developing academic writing skills in the EAP classroom**Yamuna Samarakoon^{1*}, Harsha Dulari Wijesekera^{1, 2}¹*Faculty of Marine Engineering, CINEC Campus, Malabe, 10115, Sri Lanka*²*Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*Corresponding author*: yamuna@cinec.edu

Providing timely, clear and individualised feedback is important for supporting students' academic writing development, yet providing such feedback could be challenging in large classroom settings. Alternative Assessment (AA) practices, such as rubric-based peer feedback, provide opportunities for students to participate actively in the assessment process. This study investigates students' perceptions of the role of rubrics in the peer feedback process, and the learning benefits they experience as feedback givers and receivers in an English for Academic Purposes (EAP) writing classroom. Using a practitioner-interventionist action research design, 43 second-year undergraduates at a private Sri Lankan university participated in a two-month intervention involving seven structured alternative assessment tasks. During the intervention, students engaged in peer and self-assessment activities using rubric-guided feedback. The study employed a practitioner intervention action research approach. Data were collected primarily through focus group discussions, supplemented by classroom observations and analysed using thematic analysis. Findings indicate that the use of rubrics provided students with greater clarity regarding assessment criteria and expectations for academic writing. Students also reported learning from both giving and receiving peer feedback. Giving feedback required students to engage more closely with writing criteria, identify weaknesses in peers' work and reflect on similar issues in their own writing. Receiving feedback supported students in recognising weaknesses in their own writing and considering ways of improving them. Students also reported increased confidence and a clearer understanding of the feedback process as the intervention progressed. The findings suggest that rubric-based peer feedback could provide meaningful opportunities for students to participate actively in assessment and develop greater awareness of academic writing through interaction with peers.

Keywords: Alternative assessment; Rubric-based peer feedback; Student engagement; EAP; Learner autonomy

Abstract ID: 143

A study on the challenges, training needs, and strategies for integrating new learning technologies into grade 10–11 drama and theatre arts education in Sri Lanka

Anoma Chandralatha Ranpati Saluge*, Lakmal Eranda Kumara

Faculty of Graduate studies, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka)

Corresponding author*: ME24093378@my.sliit.lk

Drama and Theatre teachers face various challenges when integrating new educational technologies into the teaching-learning process for Grades 10 and 11. Therefore, this study aimed to identify the challenges teachers encounter, determine their training needs, and identify strategies for effectively integrating new technologies into Drama and Theatre education. The study addressed three research questions concerning the challenges teachers face, the training required to overcome these challenges, and appropriate strategies for technology integration. A mixed-methods research design was employed. Quantitative data were collected from 41 Drama and Theatre teachers in the Kuliyaipitiya Education Zone, Sri Lanka, using a questionnaire, while qualitative data were obtained through interviews with four subject experts. The findings revealed that inadequate technological infrastructure, limited access to the internet and digital resources, insufficient knowledge and skills in using educational software, and limited professional training were major challenges affecting technology integration. The findings also identified continuous professional development programmes, improved technological infrastructure, enhanced access to digital and institutional resources, and appropriate technical support as important strategies for addressing these challenges. The study concludes that effective integration of new learning technologies into Drama and Theatre education requires systematic teacher training, adequate technological infrastructure, and continuous institutional support. Addressing these requirements can enhance teachers' capacity to use educational technologies effectively and contribute to improving the teaching-learning process. The findings provide useful guidance for policymakers, school administrators, teacher education institutions, and Drama and Theatre teachers in planning and implementing effective technology integration initiatives.

Keywords: Drama and theatre education, Technology integration, Teacher training needs, Educational technology, Mixed-methods approach

Abstract ID: 144

**From curriculum to classroom: insights into integrated science implementation in
Sri Lankan primary education, key stage 2**

Harini Wanasekara^{1*}, Lakmal Eranda Kumara²

¹Department of Early Childhood Development and Primary Education, National Institute of Education, Maharagama, Sri Lanka

²Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, Sri Lanka

Corresponding author*: harinigw@gmail.com

This study explores the implementation of integrated science within ERA (Environment Related Activities) in Key Stage 2 of Sri Lankan primary education. Despite the intended integration of science in primary education in Sri Lanka, a limited understanding remains of how teachers implement integrated science in the primary grades. The study was guided by three objectives: to identify science components embedded in ERA (Key Stage 2), to explore the teachers' pedagogical readiness and to explore classroom practices in implementing integrated science. A qualitative research approach was employed using one-on-one interviews with teachers and focus group interviews with curriculum developers and provincial subject directors, along with document analysis of teachers' guides for grades three and four. Data sources provided information on vertical implementation, from the national to the classroom level. The purposive sampling technique was employed to select the sample to capture the information-rich cases. Data were analysed using content and thematic analysis, and triangulation was employed to ensure validity. The key findings revealed that while the science process skills and essential science concepts are embedded within themes of ERA, its classroom implementation is limited by the deficits in pedagogical readiness of teachers. The study concludes that the successful implementation of integrated science education depends on the alignment between curriculum expectations, teacher readiness, classroom practices, and relevant institutional support. The findings of this research have important implications mainly for curriculum development and teacher education in primary science. This research will contribute to science education, which is a lifelong process that requires a strong foundation in the early years of an individual.

Keywords: Primary science education; Integrated science; Environment related activities (ERA); Curriculum implementation; Grades three and four

Abstract ID: 151**Perceived causes of mathematical anxiety and preferred coping strategies among grade 8 students at a selected 1ab school in Gampaha district**M.A.T.T.N Weerasuriya^{1*}, Chathuri Samarasinghe^{2*}¹*School of Education, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology, Malabe, 10115, Sri Lanka*²*Department of Mathematics & Statistics, Faculty of Humanities and sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*Corresponding author*: hs22625502@my.sliit.lk , chathuri.s@sliit.lk

In this study, the causes of mathematical anxiety and the coping mechanisms adopted by the Grade 8 students of the selected 1AB school in the Gampaha District of Sri Lanka have been explored. Although mathematical anxiety has been identified as a significant problem in mathematics learning, limited empirical evidence have been gathered in Sri Lankan junior secondary schools. This study aimed to identify the main perceived causes of mathematical anxiety, to determine students' preferred coping strategies, and to explore whether there are differences based on gender, academic performance and anxiety level. A mixed methods approach survey was carried out among 200 Grade 8 students at a 1AB school in the Gampaha District. The data were collected from a questionnaire developed by combining and adapting instruments from previous studies to suit the target population. The questionnaire consisted of three sections: a mathematical anxiety scale, a checklist assessing the perceived causes of mathematical anxiety, and coping strategies questionnaire that included several open-ended questions. The overall results showed that 64.0% of the respondents and 94.4% of the high-anxiety students stated that fear of failure is one of the main causes of mathematical anxiety. Task-focused attention, positive thinking and preparation (cognitive-behavioral coping strategies) were the most common coping strategies. Proactive coping behaviors were more noticeable among students with lower anxiety levels compared to those with higher anxiety levels. The most significant finding was the disparity between the amount of assistance pupils desired and the type of support they were receiving. For students, current school support was primarily described in terms of academic support, with teaching methods and practice described most often as the most valued type of support, and emotional support being described considerably less often than other types of support, suggesting a focus for further research. The results have significant implications for the design of anxiety-sensitive education practices and organized emotional assistance systems in schools in Sri Lanka.

Keywords: Mathematical anxiety; Coping strategies; Causes of mathematical anxiety; Secondary schools

Abstract ID: 152

**Factors influencing selection of agricultural science at G.C.E. Advanced level:
evidence from Kegalle education zone, Sri Lanka**

Harshani Erangika Wedagedara*, Lakmal Eranda Kumara

¹Faculty of Graduate Studies, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: me24077088@my.sliit.lk

Agricultural Science at the G.C.E. (Advanced Level) plays an important role in developing knowledge and skills related to sustainable agriculture, agribusiness, and food security. However, student participation in the subject remains relatively low, highlighting the need to understand the factors influencing students' subject choices. This study investigated the factors influencing Sinhala-medium students' selection of Agricultural Science in one education division of the Kegalle Education Zone, Sri Lanka. Specifically, it examined the influence of gender and the influence of parents, subject teachers, counselling teachers, and peers on students' subject selection. A quantitative descriptive survey design was employed among 289 Sinhala-medium G.C.E. (A/L) students from six schools offering Agricultural Science. Although Slovin's formula yielded a minimum sample of 168 students, data were collected from 192 students using stratified random sampling and a closed-ended questionnaire. Data were analysed using descriptive statistics, the Mann-Whitney U test, and the Friedman test in SPSS. The Mann-Whitney U test indicated a statistically significant difference by gender ($U = 5349.5$, $p < .05$), suggesting that gender influences students' subject selection and attitudes towards Agricultural Science. The Friedman test also revealed statistically significant differences among the examined social influences ($\chi^2 = 131.77$, $p < .05$). Counselling teachers and career guidance emerged as prominent external influences on subject selection. The findings highlight the importance of gender-sensitive career guidance and counselling in supporting students' decisions regarding Agricultural Science.

Keywords: Agricultural science; Counselling teacher influence; Gender; Parental influence; Peers; Subject selection

Abstract ID: 153

The influence of seminar-based learning with continuous assessments on mathematics performance among grade 11 students in Gampaha district

K.M.S.K. Akeshla*, K.G.S.K. Perera

School of Education, Faculty of Humanities & Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: hs22616760@my.sliit.lk sliitbed@gmail.com

Mathematics at the secondary level is a key component of the school curriculum, however many students achieve low grades, lack confidence, and experience anxiety when learning mathematics. This study investigated the effectiveness of seminar-based learning combined with weekly assessments on the mathematics performance and attitudes of Grade 11 students in a Type 1AB school in Gampaha District, Sri Lanka. The study employed a quantitative approach with a causal comparative research design. It involved Grade 11 students of whom 50 students participated in all four seminars and completed all four weekly assessments and 50 students did not participate in any of the seminars and weekly assessments. An independent-samples t-test was conducted to determine the difference in mathematics performance between the two groups, while Pearson's correlation was used to examine the relationship between weekly assessment scores and final examination marks. In addition, 25 students from the participating group completed a questionnaire to assess their attitudes towards the learning programme. The results showed no statistically significant differences between the two groups before the programme. However, after the programme, the participating group demonstrated significantly higher mathematics performance than the non-participating group. A positive correlation was also found between weekly assessment scores and final examination marks. Furthermore, students reported increased confidence, engagement, and positive attitudes towards learning mathematics. Overall, the findings indicate that seminar-based learning combined with weekly assessments may enhance students' mathematics achievement, confidence and engagement within a relatively short period.

Keywords: Formative assessment; 1AB School; Seminar based learning; Continuous assessments; Study habits

Abstract ID: 155**Ai-assisted learning for activity-based secondary science education in resource-constrained contexts: a theoretical and contextual literature review from Sri Lanka**M. S. Wickramasinghe^{1*}, I. G. Ratnayake², M. N. Kaumal³¹*Department of Science, Faculty of Science & Technology, National Institute of Education, Maharagama, 10285, Sri Lanka*²*School of Education, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka*³*Department of Chemistry, Faculty of Science, University of Colombo, Colombo, 00300, Sri Lanka*Corresponding author*: mswick@nie.edu.lk

Activity-based learning (ABL) is a student-centred pedagogical approach that promotes experiential engagement and deeper understanding of scientific concepts. However, its implementation in Sri Lankan secondary science education is constrained by limited laboratory resources, shortages of qualified science teachers and high student-teacher ratios. Artificial intelligence (AI)-assisted learning may address these challenges by supporting accessible, self-directed and interactive learning experiences. This integrative literature review examined (1) the theoretical and empirical foundations of AI-assisted learning in activity-based secondary science education and (2) the potential of AI tools to enhance ABL in Sri Lanka. A qualitative narrative synthesis integrated literature identified through a structured Google Scholar search on AI-assisted learning, science education and ABL. Social constructivism, self-determination theory and the technology acceptance model provided theoretical lenses for interpreting learning interactions, learner motivation and technology adoption. The review indicates that AI-assisted learning can support conceptual understanding, learner autonomy and self-directed learning while complementing teacher-led instruction, particularly in contexts characterised by limited resources and high student-teacher ratios. However, gaps remain in the development of locally relevant AI applications that support ABL while promoting self-directed science learning. Limited evidence was also identified regarding AI tools designed to recommend safe, available household materials as alternatives to conventional laboratory chemicals and equipment for hands-on activities. Recent educational reforms introducing AI-related content into lower-secondary Information and Communication Technology curricula in Sri Lanka indicate a growing policy environment for AI-assisted education. Overall, the review highlights the potential for developing and empirically evaluating context-responsive AI tools that facilitate resource-efficient, self-directed and hands-on science learning in Sri Lankan secondary education.

Keywords: AI-tools; Activity-based learning; Secondary science education; Resource limitation

Abstract ID: 168

**Beyond the textbook rules: using contemporary English songs to teach listening
and speaking in the ESL classroom**

Chamodi Karunanayaka

School of Education, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka

Corresponding author*: HS24100854@my.sliit.lk

This study examines how standard and “unclassified” linguistic modifications in contemporary English popular songs can be repurposed as pedagogical tools in English as a Second Language (ESL) classrooms. It specifically looks at how singers modify the sounds (phonology) and structure (morphology) of words to fit the music. The purpose of this research is to address the gap between the rigid prescriptive grammar and standard pronunciation taught in traditional textbooks and the fluid fast-paced nature of real world spoken English. The data for this study were collected through observation with note-taking technique. Eight popular English songs among Sri Lankans such as "Shape of You", "Unstoppable" and "Die with a Smile" which belong to different genres were selected as data. The lyrics and vocal performances were analysed by comparing them against standard linguistic rules to find where the singers followed the rules and where they created their own "unofficial" changes. The study revealed that singers frequently use standard phonological processes such as elision, vowel reduction, consonant cluster reduction, assimilation, and flapping alongside morphological processes such as affixation, compounding, conversion and clipping. However, the study also found unique "unclassified" changes such as "Grammar Sacrifice"(ignoring grammar to rhyme), "Lexical Stress Hijacking"(changing the parts which should be stressed), and "Syllabic Merging"(smashing two words together). Ultimately, these empirical findings are aimed to provide direct practical value for ESL classrooms in developing speaking and listening competencies by allowing ESL learners to distinguish informal, creative speech from formal academic English while developing a more natural spoken rhythm.

Keywords: Phonological processes; Morphological processes; ESL learners; Grammar sacrifice; Modern music

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A study on the antibacterial potential of hydrodistilled citrus essential oils as plant-derived antimicrobial agents against clinically relevant bacterial pathogens

Chanuka Amarasekara^{1,2,4*}, Hansa Weerakoon^{1,2}, Lochana Wettasinghe^{1,2}, Shehana Denagamage^{1,2}, Vindya Udalamaththa^{1,2,3}, Suvini Karunaratne^{4,5}

¹School of Applied Sciences, Edinburgh Napier University, Edinburgh, United Kingdom

²Spectrum Institute of Science & Technology, Colombo 00600, Sri Lanka

³Department of Biomedical Science, Asia Pacific Institute of Information Technology, Colombo 00200, Sri Lanka

⁴Helixionn Innovations (Pvt) Ltd, Malabe 10115, Sri Lanka

⁵School of Biomedical Science, Sri Lanka Institute of Information Technology, Malabe, 10115, Sri Lanka

Corresponding author*: chanukairosh045@gmail.com

Antimicrobial resistance (AMR) is a major global health challenge, increasing the need for plant-derived antimicrobial agents with potential biomedical applications. This study investigated the antibacterial potential of hydrodistilled essential oils from the endemic Sri Lankan species *Citrus crenatifolia* and the widely cultivated *Citrus reticulata* and *Citrus sinensis* against clinically relevant bacterial pathogens. Essential oils, hydrodistilled from fresh leaves were evaluated individually and as 1:1 and half-strength combinations against *Staphylococcus aureus*, *Bacillus cereus*, and *Escherichia coli* using the Kirby–Bauer disc diffusion assay, with Amoxicillin as the reference antibiotic. Statistical analysis was performed using RStudio with appropriate parametric and non-parametric tests. *C. crenatifolia* demonstrated significant antibacterial activity, particularly against *B. cereus*, showing greater inhibition than against *S. aureus* ($p = 0.0073$) and *E. coli* ($p = 0.0426$). *C. reticulata* and *C. sinensis* showed greater activity against *E. coli*. Notably, combining *C. reticulata* and *C. sinensis* enhanced inhibition against *S. aureus* ($p = 0.0392$) and *B. cereus* ($p = 0.00015$), whereas addition of *C. reticulata* to *C. crenatifolia* reduced activity against *B. cereus* ($p = 0.000005$). Several oils and combinations also demonstrated greater inhibition zones than amoxicillin. The novelty of this study lies in the comparative evaluation of an endemic Sri Lankan *Citrus* species alongside widely cultivated species and the assessment of their formulation-dependent antibacterial effects against both Gram-positive and Gram-negative pathogens. These findings highlight hydrodistilled *Citrus* essential oils, particularly *C. crenatifolia*, as promising candidates for further investigation as plant-derived antimicrobial agents for complementary biomedical and pharmaceutical applications.

Keywords: Antimicrobial resistance; Citrus essential oils; *Citrus crenatifolia*; Synergistic antibacterial activity; Plant-derived therapeutics

Abstract ID: 45**Systematic evaluation of signal-to-image transformation pipelines for vision transformer-based sleep stage classification**

Janith R.R.H. Ramanayakage*, Chandima N.P.G. Arachchige

*Department of Statistics, Faculty of Science, University of Colombo, Colombo, 00300, Sri Lanka*Corresponding author*: janithramanayake523@gmail.com

Sleep stage classification is a critical prerequisite for diagnosing sleep disorders and assessing sleep quality. While Vision Transformers (ViTs) have demonstrated remarkable success in image recognition, existing ViT-based approaches to polysomnography (PSG) sleep staging rely mainly on spectrogram or raw-signal inputs, and the optimal transformation of one-dimensional physiological signals into image representations suitable for ViT processing has not been systematically investigated. This paper presents a comprehensive evaluation of four image transformation techniques - Gramian Angular Summation Field (GASF), Gramian Angular Difference Field (GADF), Markov Transition Field (MTF), and spectrogram - for ViT-based sleep stage classification using the CAP Sleep Database (80 recordings, 80,667 epochs) with subject-wise 5-fold cross-validation. Experimental results demonstrate that GASF achieves the highest classification accuracy at 78.5% among the four transformations. Furthermore, Discrete Wavelet Transform (DWT) down sampling at 128 Hz optimizes performance, yielding 80.3% accuracy. Fine-tuning an ImageNet pre-trained ViT-B/16 model on balanced GASF representations (class balance obtained through DCGAN-based synthetic augmentation) achieves 86.2% accuracy (macro-F1 0.853), representing an improvement of 11.4 percentage points over training from scratch and 10.0 percentage points over a ResNet-50 baseline. These results indicate that GASF encoding with DWT resampling to 128 Hz is an effective preprocessing pipeline for ViT-based sleep stage classification, and that transfer learning from natural image pre-training is highly effective for PSG-derived representations.

Keywords: Sleep stage classification; Vision Transformer; Gramian Angular Field; Signal to image transformation; Transfer learning

Abstract ID: 64

Role of glutathione peroxidase 4 in pulmonary macrophages in bleomycin- and asbestos-induced lung fibrosis

Sankha Hewawasam^{1,2*}, Quanjin Dang^{1,2}, Yurong Liang^{1,2}, Chaoqun Huang^{1,2}, and Lin Liu^{1,2}¹Oklahoma Center for Respiratory and Infectious Diseases, Oklahoma State University, Stillwater, OK 74078, USA²Lundberg-Kienlen Lung Diseases and Infection Laboratory, Department of Physiological Sciences, Oklahoma State University, Stillwater, OK 74078, USACorresponding author*: hewawasamsankha@gmail.com

Idiopathic pulmonary fibrosis (IPF) is a chronic, progressive, and fatal interstitial lung disease characterized by excessive extracellular matrix deposition, persistent lung inflammation, and dysregulated repair processes. Macrophages play a pivotal role in IPF pathology, with their polarization states critically influencing inflammatory responses and fibrotic progression. Glutathione peroxidase 4 (GPX4), a key regulator of lipid peroxidation and ferroptosis, has emerged as an essential factor in mitigating oxidative stress-associated cellular injury. The present study explores the role of GPX4 in pulmonary macrophages in the context of lung fibrosis induced by bleomycin and asbestos exposure. Utilizing conditional GPX4 knockout (KO) mice, we demonstrated that macrophage-specific GPX4 deletion significantly exacerbates lung injury, inflammation, and fibrosis following fibrotic stimuli. In vitro analysis of THP-1-derived macrophages with reduced GPX4 expression revealed a marked shift toward M2 macrophage polarization, accompanied by decreased expression of M1 inflammatory markers. Additionally, GPX4 knockdown macrophages exhibited increased expression of cellular senescence markers, particularly under pro-inflammatory (M1) conditions. Collectively, these findings establish GPX4 as a critical regulator in macrophage-mediated inflammatory and fibrotic responses, offering novel insights into potential therapeutic strategies targeting GPX4 pathways to attenuate or prevent progression of IPF.

Keywords: Idiopathic pulmonary fibrosis; GPX4; Macrophage Polarization; Oxidative stress; Cellular senescence

Abstract ID: 116**Induction of the host restriction factor SHFL by clinically approved compounds:
implications for COVID-19 prophylaxis**Asiri Wijenayaka^{1*}, Plinio Hutardo²¹*School of Medicine, The University of Adelaide, Adelaide, Australia*²*Renal unit, Royal Adelaide Hospital, Adelaide, Australia*Corresponding author*: asiri.wijenayaka@adelaide.edu.au

SARS-Cov-2, the coronavirus responsible for the current global outbreak of severe acute respiratory syndrome COVID-19, is a single-stranded RNA (ssRNA) virus belonging to the Coronaviridae family. The ongoing battle against SARS-CoV-2 has driven researchers to uncover novel cellular mechanisms to halt viral replication. A critical component of how the coronavirus replicates relies on programmed -1 ribosomal frameshifting (-1 PRF). This mechanism allows the virus to bypass normal translation constraints, producing multiple essential proteins from a single RNA transcript. To combat this, mammalian cells naturally produce antiviral proteins triggered by interferon. One such protein, Shiftless Antiviral Inhibitor of Ribosomal Frameshifting (*SHFL*), specifically targets and neutralizes pathogens relying on -1 PRF. *SHFL* interacts with the viral mRNA and ribosomes, causing premature translation termination and effectively shutting down viral replication. Aim of this study was to test drugs already approved and deemed safe, for their ability to boost the body's natural *SHFL* expression. Compounds identified to induce *SHFL* could be rapidly deployed as a prophylactic for vulnerable groups. Human bronchial (16HBE14o) and alveolar (NCI-H2126) lung cell lines were exposed to pharmaceutically relevant concentrations of Metformin, Resveratrol, and Valproic Acid for 24 hours, and *SHFL* m-RNA levels were monitored. Both resveratrol and valproic acid demonstrated the ability to induce *SHFL* mRNA suggesting it may be a potential anti-viral treatment against COVID-19.

Keywords: SARSCov2; COVID19; SHFL; Valproic; Resveratrol

Abstract ID: 117**Association between abo blood group and self-reported recovery from infectious diseases among university students in Anuradhapura district, Sri Lanka**

R.A.S. Wijebandara*, A.S.S. Wijewarna

*School of Life Sciences, Asian Institute of Business and Science (AIBS), Colombo 00800, Sri Lanka*Corresponding author*: rishmi@aibs.edu.lk

Blood group has been linked to susceptibility, severity and recovery from several infectious diseases, but evidence from South Asian student populations is limited. This study investigated the association between ABO blood group and self-reported recovery outcomes among university students in the Anuradhapura District, Sri Lanka. A cross-sectional survey was administered, both online and on paper, to 322 students with a history of infectious disease within the preceding five years. Infectious disease history, symptom severity and recovery duration were self-reported and not confirmed through laboratory or clinical diagnosis. Data were analysed in IBM SPSS Statistics (version 29) using chi-square tests of independence, a chi-square goodness-of-fit test and one-way analysis of variance (ANOVA). Blood group O was markedly over-represented (62.7%) relative to published Sri Lankan population norms ($\chi^2(3) = 125.490$, $p < .0001$). None of the associations between blood group and symptom severity, recovery time, symptom progression, relapse, hospitalisation level, or students' personal beliefs about blood type's role in recovery reached statistical significance (all $p > .21$); one-way ANOVA also showed no significant difference in mean recovery time ($F(3, 318) = 1.231$, $p = .299$). Descriptively, blood group O respondents reported the shortest mean recovery time (2.46 weeks) and AB the longest (2.95 weeks). ABO blood group is not a statistically reliable predictor of self-reported recovery in this sample; perceived symptom severity may exert a stronger influence on healthcare-seeking behaviour than blood type itself.

Keywords: Blood group, Infectious disease, Self-reported recovery, Sri Lanka, University students

Abstract ID: 137

Development and validation of a next-generation sequencing assay for comprehensive *CFTR* gene analysis in clinical diagnostics

Kusal Sathsara, Damitha Liyanaarachchi, Tharmini Sundralingam¹, Mufly Bakir, Ravithra Rajasegar, Chandika Ruwan, Jayani De Zoysa, Imaad Aarif, Tarshia Gunasekara, Tharushi Nadunika, Chandanamali Punchihewa*

Genelabs Medical Pvt Ltd, 431 Nawala Rd, Sri Jayawardenepura Kotte 11222

Corresponding author*: chandanamali@genelabsmedical.com

Cystic fibrosis (CF) is an autosomal recessive disorder caused by pathogenic variants in the *CFTR* gene. While current guidelines recommend comprehensive *CFTR* analysis, no suitable clinical assay is currently available in Sri Lanka. This study aimed to develop and analytically validate a targeted next-generation sequencing (NGS) panel for comprehensive sequencing of the *CFTR* coding region for clinical diagnostics. A custom panel covering all 27 coding exons and exon-intron boundaries were designed using Ion AmpliSeq technology, achieving 100% in silico target coverage with 47 overlapping amplicons. A hotspot database containing 1,789 clinically relevant *CFTR* variants was generated using *CFTR2*, *CFTR*-France, ClinVar, and ACMG-recommended carrier screening panels. Analytical validation was performed using previously characterized positive samples containing pathogenic *CFTR* variants and a negative sample. The targeted regions achieved comprehensive coverage with adequate sequencing depth, and all but one confirmed pathogenic variant were detected, with no pathogenic variants identified in the negative control. One duplication variant within a homopolymer region was not detected by automated analysis but was confirmed by Sanger sequencing, highlighting the need for manual review and orthogonal confirmation in technically challenging regions. The developed panel provides comprehensive coverage of the *CFTR* coding region and clinically relevant variant hotspots. However, the detection of structural variants is not currently feasible with this targeted NGS assay. Overall, the developed panel demonstrates potential for clinical application in *CFTR* molecular diagnosis, provides a cost-effective approach to comprehensive *CFTR* variant analysis, and addresses an important gap in cystic fibrosis genetic testing in Sri Lanka.

Keywords: Cystic fibrosis; *CFTR*; Ion AmpliSeq; Targeted sequencing; Molecular diagnostics

Abstract ID: 138

Evaluation of the developmental and acute toxicity of *Ficus hispida* leaf and bark crude extracts in the zebrafish (*Danio rerio*) embryo

Thilini Kodithuwakku¹, Sameera Jayasinghe¹, Kamal Perera², Jeevani Dahanayake², Preethi Udagama^{3,1} and Chanika Jayasinghe^{4*}

¹Department of Applied Sciences, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Kandy Road, Malabe, Sri Lanka

²Department of Ayurveda Pharmacology, Pharmaceutics and Community Medicine, Faculty of Indigenous Medicine, University of Colombo, Sri Lanka

³School of Biomedical Sciences, Althia SLIIT HEMAS Health Uni, Kandy Road, Malabe

⁴Department of Zoology, Faculty of Natural Sciences, The Open University of Sri Lanka, Nawala, Nugegoda, Sri Lanka

Corresponding author*: cdjay@ou.ac.lk

Ficus hispida (Sinhala name: *Kotadibula*) is widely used in South Asian traditional medicine for its hypoglycaemic, neuroprotective, antidiarrheal, anti-ulcerogenic, and hepatoprotective properties; yet its toxicity profile remains obscure. This study evaluated developmental and acute toxicity of *Ficus hispida* leaf and bark methanolic extracts using zebrafish (*Danio rerio*) embryo model, following OECD Test Guideline 236 with alterations. Zebrafish embryos (2 hours after fertilization) were exposed to a concentration series of each extract for 96 hours, where lethal concentration 50 (LC50) values and toxicological endpoints (coagulation-CA, lack of somite formation-LSF, lack of heartbeat-LH, and non-detachment of the tail-NDT) were recorded at 24, 48, 72, and 96 hours post fertilisation. Both extracts exhibited time and concentration dependent acute toxicity, with declining LC50 values over the exposure period. The bark extract was significantly more toxic than the leaf extract at every time point, with 96-hour LC50 values of 1.66 ± 0.23 $\mu\text{g/mL}$ and 15.22 ± 3.61 $\mu\text{g/mL}$, respectively ($p < 0.05$). Lethal endpoint frequencies, particularly lack of somite formation, lack of heartbeat, and non-detachment of the tail, increased with concentration of both extracts, with reduced hatching rates, while no mortality occurred in the controls. These findings demonstrate that *Ficus hispida* bark extract exhibit high developmental and acute toxicity on zebrafish embryos than the leaf extract, underscoring the need for safety evaluation prior to the pharmacological or traditional therapeutic applications.

Keywords: *Ficus hispida*; Zebrafish embryo; Acute toxicity; Developmental toxicity

Abstract ID: 140

Th1:Th2 cytokine balance as a sensitive immunotoxicity biomarker: IFN- γ and IL-10 responses in zebrafish (*Danio rerio*) larvae exposed to polystyrene microplastics

Abhimani Kulatunga¹, Malith Rathnayaka², Preethi Udagama^{1,2}, Chanika Jayasinghe^{3*}

¹Department of Applied Sciences, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Sri Lanka

²School of Biomedical Sciences, SLIIT/HEMAS Althia Health Uni, Sri Lanka

³Faculty of Natural Sciences, The Open University of Sri Lanka, Nawala, Sri Lanka

Corresponding author*: cdjay@ou.ac.lk

Microplastics (MPs) are pervasive aquatic pollutants, yet their effects on immune balance during the early life stages of fish remain poorly understood. This study evaluated the immunomodulatory potential of 10 μ m polystyrene microplastics in zebrafish (*Danio rerio*) larvae by measuring a pro-inflammatory Th1 cytokine, interferon-gamma (IFN- γ), and a regulatory Th2-associated cytokine, interleukin-10 (IL-10), and by using their ratio (IFN- γ :IL-10) as an integrated index of the Th1:Th2 immune balance. Larvae were exposed from 48 to 96 hpf to sublethal concentrations (0.53 and 1.06 mg/L) and the 96-h median lethal concentration (5.30 mg/L), and cytokine concentrations were quantified in larval lysates by ELISA. Data were analysed by one-way ANOVA followed by Tukey's HSD test. IFN- γ was significantly elevated relative to the control at every exposure concentration ($p < 0.001$ at 0.53 and 1.06 mg/L; $p < 0.01$ at 5.30 mg/L), but the response was non-monotonic, peaking at 1.06 mg/L and declining significantly thereafter (1.06 versus 5.30 mg/L, $p < 0.01$). IL-10 did not differ significantly across concentrations ($p > 0.05$). Despite the rise in IFN- γ , the Th1:Th2 ratio remained statistically unchanged across all groups ($p > 0.05$), ranging from 4.6 to 5.1. These results indicate that microplastic exposure activates a pro-inflammatory Th1 response at concentrations well below the lethal threshold, but that the overall Th1:Th2 balance is preserved within the tested range. The IFN- γ :IL-10 ratio is proposed as a sensitive integrated readout of immune perturbation, with implications for the environmental risk assessment of microplastic pollution.

Keywords: Microplastics; Zebrafish; Immunotoxicity; Th1:Th2 balance; Interferon-gamma

Abstract ID: 141

Beyond aggregate accuracy: convergent misclassification across machine learning models reveals a sociologically moderated phenotypic subtype of alcohol dependence in a Sri Lankan cohort

Malith Rathnayaka¹, Sanjula Rupasinghe², Inoka Perera², Madri Senanayake³, Mahesh Rajasuriya³, Dilrukshi Abeysinghe⁴, Preethi Udagama^{1,2,5}, and Mahima Weerasinghe^{6*}

¹School of Biomedical Sciences, SLIIT/HEMAS Althia Health Uni, Malabe, Sri Lanka

²Center for Immunology & Molecular Biology, Department of Zoology & Environment Sciences, Faculty of Science, University of Colombo, Colombo 3, Sri Lanka

³Department of Psychiatry, Faculty of Medicine, University of Colombo, Colombo 8, Sri Lanka

⁴Department of Sociology, Faculty of Arts, University of Colombo, Colombo 3, Sri Lanka

⁵Faculty of Humanities & Sciences, Sri Lanka Institute of Information Technology, Malabe, Sri Lanka

⁶Faculty of Computing, Sri Lanka Institute of Information Technology, Malabe, Sri Lanka

Corresponding author*: mahima.w@sliit.lk

Machine learning models applied to Alcohol Use Disorder (AUD) classification are typically evaluated on aggregate accuracy, with misclassified cases treated as residual error. However, when multiple independent models consistently misclassify the same individuals, this convergence may indicate distinct phenotypic subtypes rather than random prediction failure. Three supervised classifiers Support Vector Machine, Random Forest, and Decision Tree were trained to distinguish alcohol-dependent (AD; n=31) from moderate drinking (MD; n=30) participants within a Sri Lankan male cohort (N=91; abstinent controls [n=30] were excluded from classification), using total antioxidant capacity (TAC), serum interleukin-6 (IL-6) concentration, oxidative stress index (OSI), ADH1B (rs1229984) genotype, and paternal problem-use history as features. Seven individuals were misclassified by all three models. Profiling against sociological, behavioural, and clinical variables excluded from the original feature set revealed a coherent pattern. The five misclassified AD individuals exhibited oxidative stress levels characteristic of the MD group, complete absence of familial problem-use history, fewer social consequences, and lower weekly consumption. Notably, 60% were prescribed omeprazole and thiamine, medications that may plausibly attenuate oxidative stress biomarkers. The two misclassified MD individuals displayed the converse profile: elevated oxidative stress and paternal problem-use history characteristic of the AD group. These exploratory findings indicate an alcohol dependence subtype in which medication use, beverage quality, and sociological factors moderate expected biological signatures, rendering these individuals undetectable by biomarker-based models. Systematic investigation of convergent misclassification can therefore reveal clinically meaningful subtypes that aggregate performance metrics alone fail to capture.

Keywords: Alcohol use disorders; Convergent misclassification; Oxidative stress biomarkers; Phenotypic subtypes; Sociological confounders

Abstract ID: 142**Microplastic-induced monocytosis as a potential biomarker of immunotoxicity in adult zebrafish (*Danio rerio*)**Anuk Peiris¹, Malith Rathnayaka¹, Chanika Jayasinghe², Gayani Rajapaksha³, Preethi Udagama^{4*}¹Department of Applied Sciences, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, 10115, Sri Lanka²Department of Zoology, Faculty of Natural Sciences, The Open University of Sri Lanka, Nawala, Nugegoda³Department of Zoology, Faculty of Science, University of Kelaniya, Sri Lanka⁴School of Biomedical Sciences, Althia SLIIT HEMAS Health Uni, Kandy Road, Malabe, Sri LankaCorresponding author*: preethi.u@sliit.lk

Microplastic (MP) pollution is a growing problem in aquatic ecosystems, but its risk is often assessed using mortality and behavioural endpoints that may not detect sub-lethal effects. This study examined whether the differential white blood cell (WBC) count could reveal changes in the immune status of exposed fish that are not visible externally. Adult zebrafish (*Danio rerio*) were exposed for 28 days to polypropylene MPs (0, 25, 50, 100, 500 and 1000 $\mu\text{g L}^{-1}$; three replicate tanks per concentration) under a static-renewal design adapted from Organization for Economic Co-operation and Development (OECD) Test Guidelines 204 and 215. Stained blood smears (two fish per tank; $n = 6$ per concentration) were used to determine the proportions of lymphocytes, neutrophils and monocytes. All fish survived and behavioural scores remained normal in every group, yet the leucocyte profile differed across the treatment series (multivariate analysis of variance, Wilks' $\lambda = 0.098$, $p < 0.001$). Monocytes increased approximately ten-fold, from $1.67 \pm 0.6\%$ in controls to $15.83 \pm 1.1\%$ at $1000 \mu\text{g L}^{-1}$ ($p < 0.001$). Neutrophils peaked at $50 \mu\text{g L}^{-1}$ (35.3%) and declined significantly by $1000 \mu\text{g L}^{-1}$ ($p < 0.05$), whereas the apparent decrease in lymphocytes (70.3% to 61.2%) was not statistically significant ($p = 0.08$). These findings show that MP exposure altered the innate leucocyte profile. The differential WBC count is a low-cost, minimally invasive screening indicator of MP-associated immune alteration, and monocytosis should be confirmed with functional, histological and molecular endpoints before it is interpreted as immunotoxicity.

Keywords: Microplastics; Monocytosis; Leucocyte profile; Zebrafish; Biomarker

Abstract ID: 148

A novel polyherbal distillate stimulates the proliferation of primary human melanocytes: potential application in repigmentation therapyPraneeth Ratnayake^{1,4}, Udaya Samaratunga^{2†}, Jayamini Seneviratne³, Preethi Udagama^{1,4*}¹Department of Zoology and Environment Sciences, University of Colombo, Colombo 03, Sri Lanka²Department of Ayurveda Basic Principals, Gampaha Wickramarachchi University of Indigenous Medicine, Sri Lanka (†Deceased March 26, 2022)³Dermatology unit, Lady Ridgeway Hospital for Children, Dr. Danister A. De Silva Mawatha, Colombo 08, Sri Lanka⁴School of Biomedical Sciences, ALTHIA SLIIT/HEMAS Health Uni, MalabeCorresponding author*: preethi.u@sliit.lk

Vitiligo is a depigmentation disorder characterised by the loss of functional epidermal melanocytes, resulting in hypopigmented or amelanotic skin lesions. Since successful repigmentation depends partly on the proliferation of residual melanocytes and their subsequent migration into affected areas, where stimulation of melanocyte growth represents an important therapeutic strategy. This study evaluated the proliferative effect of a novel polyherbal distillate prepared from mature leaves of *Ficus hispida* and *Cassia alata* on primary human epidermal melanocytes. Primary melanocyte cultures were established from neonatal prepuce samples obtained following routine circumcision surgery. Cells were treated for 24 hours with doubling dilutions of the polyherbal distillate ranging from 8% to 0.03125% (v/v). Melanocyte proliferation was assessed using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide dye-reduction assay. Experiments were performed in triplicate across three independent experimental repeats, and data were analysed using one-way analysis of variance followed by Tukey's post hoc test. Distillate concentrations of 1%, 0.5%, 0.25%, 0.125%, 0.0625% and 0.03125% significantly increased melanocyte proliferation compared with the untreated control ($p < 0.05$), producing mean proliferation values of 106.38%, 102.36%, 122.22%, 126.48%, 119.39% and 138.54%, respectively. Concentrations of 2% and above did not produce statistically significant effects. These findings demonstrate that low concentrations of the *Ficus hispida*–*Cassia alata* distillate stimulate primary human melanocyte proliferation. Neutral red assay and comet assay indicated no cytotoxicity within the selected working concentration range of *Ficus-Cassia* distillate (FCD), and no detectable genotoxicity under the conditions tested, respectively. The preparation therefore represents a promising botanical lead for further development as a sustainable, safe, repigmentation approach for vitiligo and related hypopigmentation disorders.

Keywords: Botanical rug lead; *Cassia alata*; *Ficus hispida*; Melanocyte proliferation; Vitiligo

Abstract ID: 154

From crude extract to effector molecule: Bioactivity-guided isolation of β -sitosterol reveals the molecular basis of marine sponge (*Haliclona (Soestella)* sp.) immunostimulation

Shakila Rathnayake^{1,2}, Lalith Jayasinghe³, Varuni Gunathilake¹, Nissanka de Silva¹ and Preethi Udagama^{2*}

¹Department of Zoology, Faculty of Applied Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka

²Centre for Immunology and Molecular Biology, Department of Zoology and Environment Sciences, Faculty of Science, University of Colombo, Colombo 3, Sri Lanka

³National Institute of Fundamental Studies, Kandy, Sri Lanka

Corresponding author*: preethi@zoology.cmb.ac.lk

Marine bioactive compounds are an important source of chemically diverse compounds with significant therapeutic potential. However, the complexity of marine bioactive extracts often limits their scientific validation and therapeutic standardization. This study demonstrated a bioactivity-guided fractionation approach to progressively enhance the immunostimulatory activity of the Sri Lankan marine sponge *Haliclona (Soestella)* sp. Phagocytic capacity of Wistar rat peritoneal macrophages was evaluated at each stage of purification, from the crude extract through successive chromatographic fractions to the isolated pure compound. The sponge crude extract (SCE) was sequentially fractionated using silica gel column chromatography, and the phagocytic capacity of Wistar rat peritoneal macrophages was evaluated using the nitroblue tetrazolium assay. The most active fraction was further sub fractionated. Compared to the control, SCE recorded maximum enhancement in phagocytic capacity (PC) at 2 μ g/mL recording an increment of $60.47 \pm 2.03\%$ ($p < 0.05$). This activity was progressively enhanced throughout the chromatographic purification of the SCE, with fraction SCE5 exhibiting the highest activity among all fractions ($64.45 \pm 0.01\%$ at 2 μ g /ml; $p < 0.001$). Further purification identified the most active subfraction, SCE5A, as β -sitosterol (results not shown) which at 6 μ g/mL increased the phagocytic capacity Wistar rat peritoneal macrophages by $84.38 \pm 0.92\%$ compared to the control ($p < 0.01$). Neutral red assay and comet assay respectively confirmed lack of cytotoxicity, and genotoxicity of SCE and of SCE5A. Thus, evaluating bioactivity throughout the purification process reveals a strategic approach to understand whether this bioactivity is associated with a specific bioactive compound or whether it is a synergistic effect of multiple bioactive compounds.

Keywords: Marine sponge; *Haliclona (Soestella)* sp.; Bioactivity-guided fractionation; β -sitosterol; Phagocytosis; Immunostimulation



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